Final Draft **April 2005**

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN

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COMPREHENSIVE EVERGLADES RESTORATION PLAN

Programmatic Regulations

Six Program-Wide Guidance Memoranda

U.S. Army Corps of Engineers
Jacksonville District

South Florida Water Management District

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INTRODUCTION

First authorized by Congress in 1948, the Central and Southern Florida (C&SF) Project provides the South Florida ecosystem with flood control, regional water supply, prevention of saltwater intrusion, preservation of fish and wildlife, recreation, and navigation. In fulfilling these objectives, the project has had unintended adverse effects on the natural environment that constitutes the Everglades and South Florida ecosystem. As a result, in 2000 Congress authorized the Comprehensive Everglades Restoration Plan (CERP) or "Plan" to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region. CERP consists of structural and operational modifications to the C&SF Project and will be implemented over the next 35 years. Together these components are expected to deliver benefits to improve the ecological functioning of over 2.4 million acres of the South Florida ecosystem, improve urban and agricultural water supply, improve deliveries to coastal estuaries, and improve regional water quality conditions, while maintaining the existing levels of flood protection.

GOALS AND PURPOSES OF THE PLAN

The Water Resources Development Act of 2000 (WRDA 2000) approved the Plan contained in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" dated April 1, 1999. As stated in Section 601(h) of WRDA 2000, "the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including flood protection and water supply." As approved by Congress, the Plan contains 68 major components that anticipate the creation of approximately 217,000 acres of reservoirs and wetland-based water treatment areas, wastewater reuse plants, seepage management, and the removal of levees and canals in natural areas. These components vastly increase storage and water supply for the natural system, as well as for urban and agricultural needs, while continuing to fulfill the original objectives of the existing Central and Southern Florida Project. The Plan will restore more natural flows of water, including sheetflow; improve water quality; and establish more natural hydroperiods in the South Florida ecosystem. Improvements to fish and wildlife habitat, including those that benefit threatened and endangered species, are expected to occur as a result of the restoration of hydrologic conditions. This will promote the recovery of native flora and fauna, including threatened and endangered species.

WRDA 2000 requires that:

> "The Plan shall be implemented to ensure the protection of water quality in, the reduction of the loss of fresh water from, and the improvement of the environment of the South Florida ecosystem and to achieve and maintain the benefits to the natural system and human environment described in the Plan, and required pursuant to this section, for as long as the project is authorized."

THE PROGRAMMATIC REGULATIONS

The Water Resources Development Act of 2000 (WRDA 2000) required the Secretary of the Army, with the concurrence of the Secretary of the Interior and the Governor of Florida, and after notice and opportunity for public comment, to promulgate programmatic regulations to ensure that the goals and purposes of the Plan are achieved and to establish the processes necessary for implementing the Plan. The final programmatic regulations became effective on December 12, 2003 as Title 33, Part 385 of the Code of Federal Regulations.

INTEGRATED FRAMEWORK FOR ASSURING THE GOALS AND PURPOSES OF THE PLAN ARE ACHIEVED

Section 601(h) of WRDA 2000 and the programmatic regulations establish an integrated framework of tools, processes, and an enforcement mechanism for ensuring that the goals and purposes of the Plan are achieved. This framework includes tools for planning, implementation, and evaluation; a process for developing these tools in an open public process, with input from other Federal, State, and local agencies; and an enforcement mechanism to ensure that the requirements of the statute are carried out. Figure 1 illustrates this framework.

Tools

WRDA 2000 establishes the following tools for ensuring that the goals and purposes of the Plan are achieved:

- The specific planning tool established by Section 601(h) of WRDA 2000 is the Project Implementation Report (PIR).
- The specific implementation tools established by Section 601(h) of WRDA 2000 are Project Cooperation Agreements (PCAs) and Operating Manuals.
- The specific evaluation tool established by Section 601(h) of WRDA 2000 is the interim goals for evaluating the restoration success of the Plan.
- In addition to the specific planning, implementation, and evaluation tools established by Section 601(h) of WRDA 2000, the programmatic regulations establish additional tools, including but not limited to, Project Management Plans, Program Management Plans, Comprehensive Plan Modification Reports, the Master Implementation Sequencing Plan (MISP), and interim targets for evaluating progress towards achieving the other water-related needs of the region.

Processes

The programmatic regulations establish the processes for developing these tools. Consistent with Section 601(h) of WRDA 2000, the programmatic regulations were developed after notice and opportunity for public comment, with the concurrence of the Secretary of the Interior and the Governor, and in consultation with the Seminole Tribe of Florida, the

Miccosukee Tribe of Indians of Florida, the Administrator of the Environmental Protection Agency, the Secretary of Commerce, the Florida Department of Environmental Protection, and other Federal, State, and local agencies.

Enforcement Mechanism

The specific enforcement mechanism established by Section 601(h) of WRDA 2000 is the "Comprehensive Everglades Restoration Plan Assurance of Project Benefits Agreement," dated January 9, 2002, between the President and the Governor, under which the State will ensure by regulation or other appropriate means, that water made available by each project in the Plan will not be permitted for a consumptive use or otherwise made unavailable by the State until such time as sufficient reservations of water for the restoration of the natural system are made under State law in accordance with the PIR and consistent with the Plan.

GUIDANCE MEMORANDA

Section 385.5 of the programmatic regulations specifically requires the development of six program-wide guidance memoranda that are consistent with the programmatic regulations and applicable law, and establish additional procedures to achieve the goals and purposes of the Plan. The guidance memoranda are fundamental to the integrated framework; provide direction for using the tools for planning, implementation, and evaluation; and provide assurances that the goals and purposes of the Plan will be achieved. Figure 1 illustrates the interrelationship between the tools and technical guidance used to implement the tools. Figure 1 also illustrates the interrelationship between each of the guidance memoranda as well as with the integrated framework of tools, processes, and enforcement mechanisms. Presenting the six guidance memoranda as one complete package also demonstrates how they work in concert to ensure the goals and purposes of the Plan are achieved. The guidance memoranda address numerous topics including common methods, general procedures, and guidance to implement the Plan. The six program-wide subjects for the guidance memoranda as set forth in the programmatic regulations are:

- Guidance Memorandum #1: Project Implementation Reports
- Guidance Memorandum #2: Formulation and Evaluation of Alternatives for Project Implementation Reports
- Guidance Memorandum #3: Savings Clause Requirements
- Guidance Memorandum #4: Identifying Water Needed to Achieve the Benefits of the Plan
- Guidance Memorandum #5: Operating Manuals
- Guidance Memorandum #6: Assessment Activities for Adaptive Management

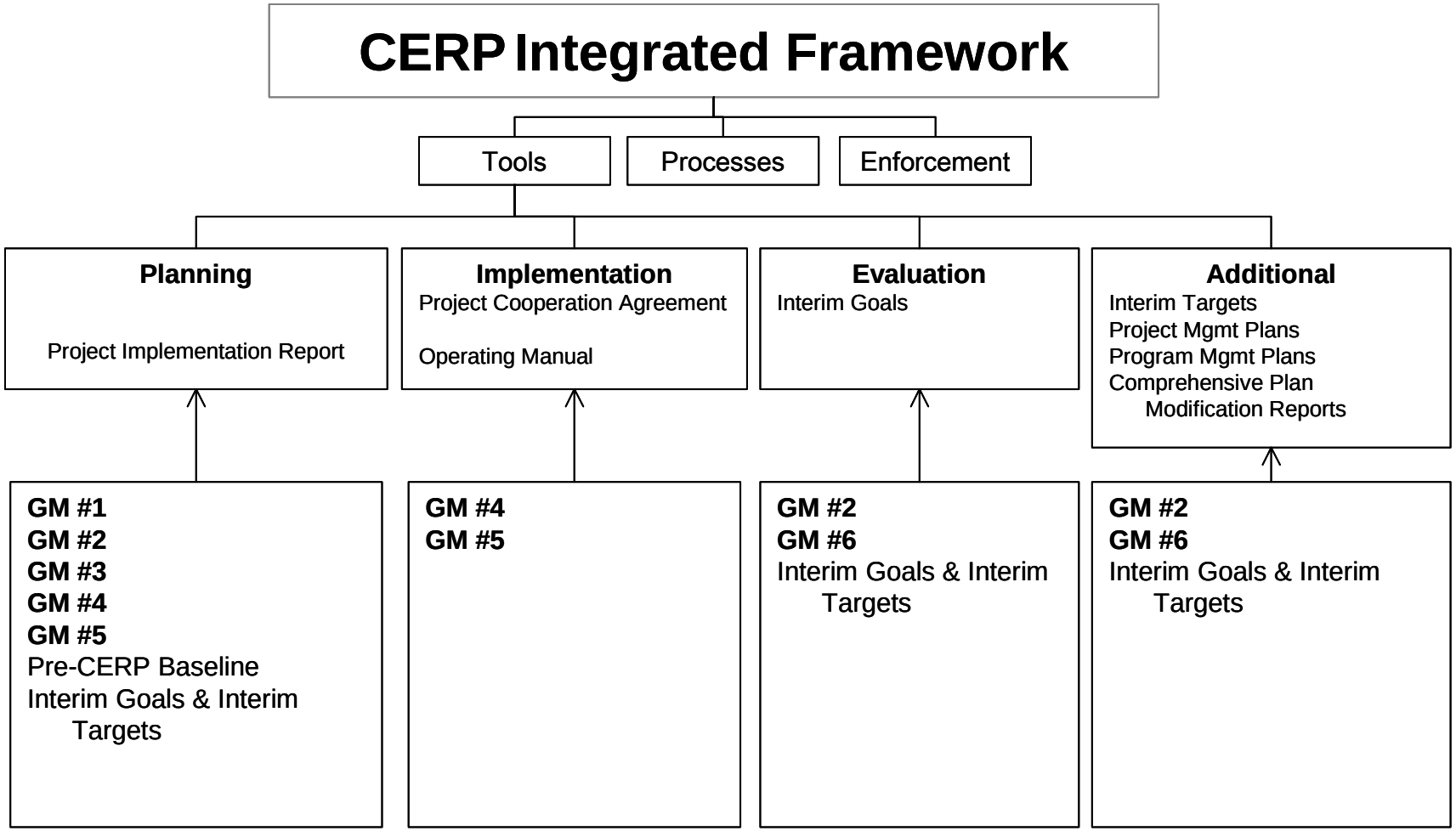


Figure 1: Framework For Assuring Goals And Purposes Of The Plan Are Achieved

GUIDANCE MEMORANDA DEVELOPMENT AND APPROVAL PROCESS

Section 385.1 of the programmatic regulations requires the Secretary of the Army to ensure that the public understands the linkage between the processes, tools, and enforcement mechanism and can monitor the effectiveness of this integrated framework in assuring that the goals and purposes of the Plan are achieved by:

(i) Providing for public notice and comment in the development of planning, implementation, and evaluation tools;

(ii) Providing notice of final action on planning, evaluation, and implementation tools;

(iii) Making available to the public on a web site or by other appropriate means final, and where appropriate, draft copies of all planning, evaluation, and implementation tools; and

(iv) Explaining through the programmatic regulations and by other appropriate means the process for developing the tools, the linkage between the process, tools, and enforcement mechanism, and the means by which these elements constitute an integrated framework for assuring that the goals and purposes of the Plan are achieved.

Section 385.5(b) of the programmatic regulations describes the special processes for the development of the six program-wide guidance memoranda. The development process for these guidance memoranda was initiated prior to the effective date of the programmatic regulations in order to layout a strategy for effectively and efficiently developing the technical work products and to elevate issues for resolution within the prescribed time frame. The programmatic regulations require that the USACE and the South Florida Water Management District (SFWMD) develop, in consultation with the Department of the Interior, the Environmental Protection Agency, the Department of Commerce, the Miccosukee Tribe of Indians of Florida, the Seminole Tribe of Florida, the Florida Department of Environmental Protection, and other Federal, State, and local agencies, the six guidance memoranda for approval by the Secretary of the Army. Figure 2 illustrates the guidance memoranda development and approval process as required by Section 385.5 of the programmatic regulations.

The USACE and the SFWMD began the development process by inviting all of the governmental entities that would be consulting on the documents to participate on a team responsible for developing the guidance memoranda. This interagency team was then further divided into sub-teams responsible for preparing initial outlines and drafting the documents. This process was designed to be open and inclusive. An initial public meeting was held at SFWMD headquarters in West Palm Beach to invite the public to participate in the process and present the strategy for developing the guidance. Information about the work of the teams (meeting summaries and initial work products) was posted on the CERP website (www.evergladesplan.org). Throughout the yearlong development process briefings were conducted for the SFWMD Water Resources Advisory Commission and the South Florida Ecosystem Restoration Task Force. In October 2004, an In-Progress Review meeting was held with USACE South Atlantic Division and Headquarters and

the Office to the Assistant Secretary of the Army to review the draft work products, resolve issues, and request direction from USACE management.

As part of the consultation process required by the programmatic regulations, a draft of this document containing the six guidance memoranda was made available for review by agencies and the public in November 2004. The review period for the agencies and the public remained open until January 2005. Meetings were also held with stakeholder groups during this period. Consultation meetings were held with the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida. The USACE and the SFWMD also consulted with the South Florida Ecosystem Restoration Task Force at their meetings in December 2004 and January 2005. Comments were received from a number of agencies, stakeholder groups, and individuals. These comments were posted on the CERP web site. The USACE and SFWMD then prepared this final draft document containing the guidance memoranda. All of the comments were reviewed and considered in the preparation of this document. In accordance with the programmatic regulations, this document containing the guidance memoranda was submitted to the Secretary of the Army for approval and concurrence by the Secretary of the Interior and the Governor.

ORGANIZATION OF THIS DOCUMENT

The guidance memoranda are fundamental to the integrated framework; provide direction for using the tools for planning, implementation, and evaluation; and provide assurances that the goals and purposes of the Plan will be achieved.

This document contains the six guidance memoranda and is divided into six main sections, one for each of the guidance memorandums. Where necessary, technical details that will assist Project Delivery Teams with using the guidance are included at the end of that section as an attachment. This document also contains appendices that include a glossary of terms, a list of acronyms, and a list of references.

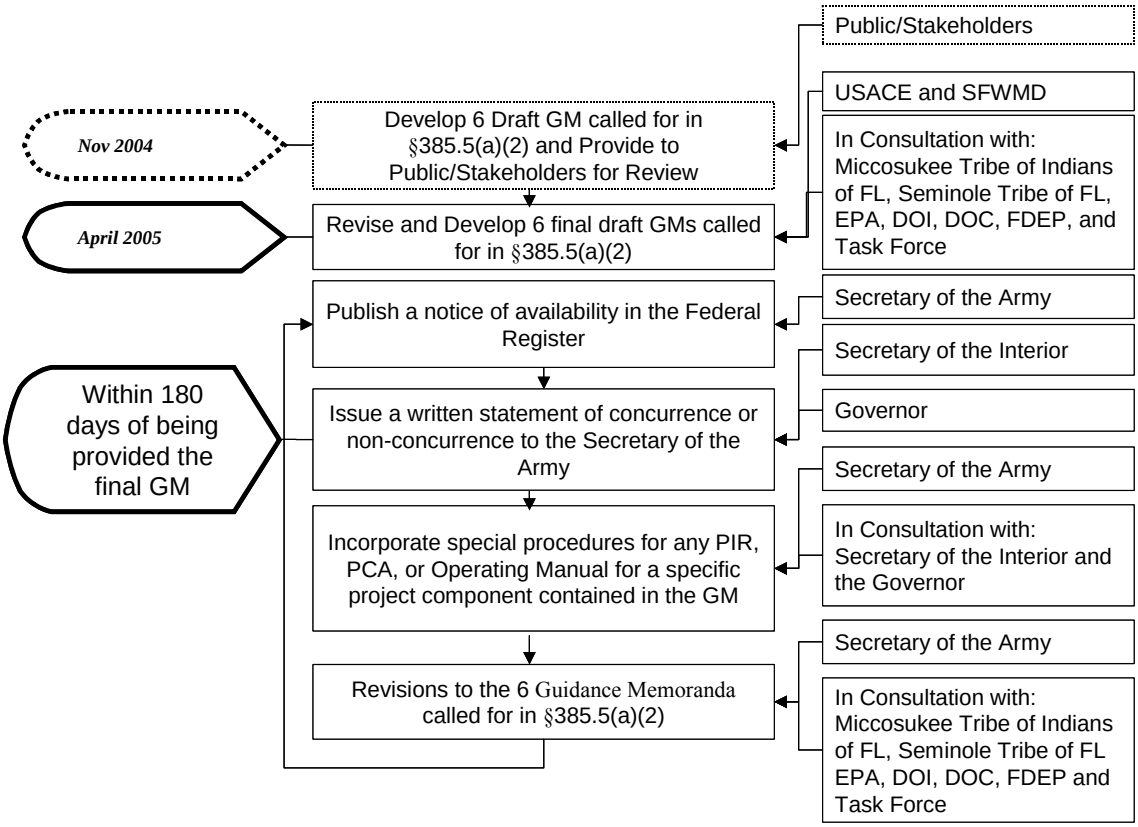


Figure 2: Guidance Memoranda Approval Process

SECTION 1: GUIDANCE MEMORANDUM #1
PROJECT IMPLEMENTATION REPORTS

1.1 PURPOSE

The programmatic regulations for the Comprehensive Everglades Restoration Plan require that a guidance memorandum be developed "that describes the major tasks that are generally needed to prepare a Project Implementation Report and the format and content of a Project Implementation Report." This guidance memorandum provides information to Project Delivery Teams about the purpose and requirements of a Project Implementation Report and presents an outline for the content of a Project Implementation Report.

1.2 APPLICABILITY

This guidance memorandum applies to all CERP projects. WRDA 2000 requires that a Project Implementation Report (PIR) be prepared for each CERP project (except for pilot projects) prior to implementation. The major tasks, PIR format, and PIR content should be similar for all PIRs. There may be differences in the level of detail included in each PIR and in the time necessary for completion based on specific situations. For example, the amount of detail necessary to complete each section of the PIR, the extent of previous formulation, the planning research activities and/or the design detail may differ from project to project.

1.3 PROJECT IMPLEMENTATION REPORTS

In accordance with the Water Resources Development Act of 2000 (WRDA 2000) and the programmatic regulations (Section 385.26), a PIR is required to be completed prior to implementing any component of CERP. The PIR is intended to bridge the gap between the conceptual level of detail contained in the April 1999 "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement," and the detailed design necessary to prepare plans and specifications required to proceed to construction. It should provide to decision-makers and the public a well-organized, clear and concise documentation of the process the Project Delivery Team followed during the planning effort. Additionally, it provides environmental compliance information, such as Endangered Species Act coordination, Section 404 of the Clean Water Act evaluations, and includes an integrated National Environmental Policy Act (NEPA) document that will fully disclose anticipated effects associated with the implementation of the alternative plans being evaluated, including the "no action" alternative. Section 10.3.1 of the April 1999 "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" provides more information about Project Implementation Reports.

The PIR documents the planning process and all relevant assumptions and rationale for project decision-making. All planning analyses, including economic, environmental, water quality, flood protection, real estate, and plan formulation, conducted during the planning

phase are documented and included in the PIR. The PIR includes a full description and analysis of the benefits expected for each alternative plan. The PIR is also the document in which to identify, quantify and attempt to resolve uncertainties regarding the cost or performance of alternative plans or project components. These uncertainties are not limited to hydrologic performance of the specific structure component, but also include uncertainties about the expected ecosystem response to the component. In addition, the PIR documents design activities for the selected alternative plan such as modeling, hydraulic design, real estate, etc.

WRDA 2000 requires that Project Implementation Reports (PIRs) developed under the Plan:

> "be consistent with the Plan and the programmatic regulations promulgated under paragraph (3) [of the Act]; describe how each of the requirements stated in paragraph (3)(B) is satisfied; comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system; identify the amount of water to be reserved or allocated for the natural system necessary to implement, under State law, sub clauses (IV) and (VI) ; comply with applicable water quality standards and applicable water quality permitting requirements under subsection (b)(2)(A)(ii); be based on the best available science; and include an analysis concerning the cost-effectiveness and engineering feasibility of the project."

All PIRs must accomplish the following:

- Provide the level of information, documentation and analysis in addition to that in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" dated April 1, 1999, necessary for the Federal government and the State of Florida to approve CERP projects for authorization.
- Present the formulation, evaluation, selection, justification, and description of the selected alternative plan.
- Document the project cost and cost-sharing requirements of the non-Federal sponsor and the USACE, along with their responsibilities for implementation and operation of the project.
- Link the actions proposed in the subject PIR to the overall system-wide CERP Plan.
- Fulfill the requirements of WRDA 2000 and the programmatic regulations.

While the PIR has many aspects of a USACE feasibility study, the primary difference in these two reports is in the steps taken to complete formulation and evaluation of the project. Unlike a feasibility study, the PIR is based on components that have previously been formulated to a certain level in developing the Plan and are expected to accomplish specific Plan goals. As such, the PIR always begins with the formulation already completed in developing the Plan. In many cases, it is envisioned that the PIR effort will focus on optimization of the project described in the Plan. However, in some cases, formulation of additional alternatives will be needed.

1.4 PROGRAMMATIC REGULATIONS REQUIREMENTS

The programmatic regulations require that each Project Implementation Report:

- Be consistent with the Plan and applicable law, policy, and regulation, including the Principles and Guidelines of the Water Resources Council, as modified by Section 601(f)(2)(A) of WRDA 2000;
- Be based on the best available science;
- Comply with all applicable Federal, State, and Tribal laws;
- Contain sufficient information for proceeding to final design of the project, such as: additional plan formulation and evaluation, environmental and/or economic benefits, engineering and design, costs, environmental impacts, real estate requirements, and the preparation of the appropriate National Environmental Policy Act documentation;
- Contain the information necessary to determine that the activity is justified by the environmental benefits derived by the South Florida ecosystem in accordance with Section 601(f)(2)(A) of WRDA 2000 and/or that the benefits of the project are commensurate with costs, and that the project is cost-effective;
- Comply, in accordance with Section 601(b)(2)(A)(ii) of WRDA 2000, with applicable water quality standards and applicable water quality permitting requirements;
- Identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;
- Identify the amount of water to be reserved or allocated for the natural system under State law necessary to implement the provisions of sections 601(h)(4)(A)(iv) and (vi) of WRDA 2000;
- Identify the quantity, timing, and distribution of water made available for other water-related needs of the region;
- Determine if existing legal sources of water are to be eliminated or transferred;
- Determine that implementation of the selected alternative will not reduce levels of service for flood protection that: (1) were in existence on the date of enactment of Section 601 of WRDA 2000; and (2) are in accordance with applicable law; and, as appropriate, consider opportunities to provide additional flood protection;
- Include an assessment of the monetary and non-monetary benefits and costs, optimization and justification, cost-effectiveness, and engineering feasibility of the project;
- Include a discussion of any significant changes in cost or scope of the project from that presented in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement," dated April 1, 1999;
- Include an analysis, prepared by RECOVER of the project's contributions towards achieving the goals and purposes of the Plan, including, as appropriate, suggestions for improving the performance of the alternative plans;
- Describe how the project contributes to the achievement of interim goals and interim targets;
- Include a draft Project Operating Manual as an appendix; and
- Include, as appropriate, information necessary for the non-Federal sponsor to address the requirements of Chapter 373 of the Florida Statutes, and other applicable planning and reporting requirements of Florida law.

1.5 LEVEL OF DETAIL FOR PROJECT IMPLEMENTATION REPORTS

The level of detail contained in a PIR should be commensurate with the complexity of the project while including the information necessary to meet the specific content requirements of WRDA 2000 and NEPA. A specific opportunity to reduce the level of detail are the programmatic authority projects described in Section 601(c) of WRDA 2000 allows the Army to approve projects in the Plan. These projects have a cost limitation of $25,000,000, are generally consistent with traditional water resources projects.

1.6 IN-PROGRESS REVIEWS AND OTHER MEETINGS

As required by applicable Corps of Engineers regulations, policies, and procedures, In-Progress Review (IPR) meetings with Corps Headquarters (HQ) and the Office of the Assistant Secretary of the Army for Civil Works will be held periodically during the development of the PIR. The primary objective of IPR is to discuss and resolve policy issues to ensure that the PIR progresses in an orderly manner and that preparation of the final PIR is not delayed. An IPR may be held at any time during the PIR process to provide an update of findings and progress, identify potential problems (technical/policy), and document decisions. In addition, in accordance with USACE policy and procedures, checkpoint meetings such as the Feasibility Scoping Meeting (FSM) and the Alternative Formulation Briefing (AFB) will be held at key decision points during the development of the PIR. Documentation from these meetings will be made available to the public.

1.7 COORDINATION WITH RECOVER

RECOVER (REestoration COordination and VERrification) is a system-wide program element of CERP implementation. The role of RECOVER is to organize and apply scientific and technical information in ways that are most effective in supporting the objectives of CERP, and to ensure that the system-wide goals and purposes of the Plan are achieved. RECOVER has three primary missions:

- **Assessment** - to physically measure (through monitoring) and interpret actual responses in the natural and human systems as CERP projects are implemented.
- **Evaluation** - to work with the project delivery teams to evaluate (through predictive modeling) and maximize the contribution made by each project to the system-wide performance of CERP.
- **Planning and Integration** - to identify potential improvements in the design and operation of the CERP, consistent with the CERP objectives, and to strive for consensus regarding scientific and technical aspects of CERP.

RECOVER provides assistance to the Project Delivery Team in accomplishing specific activities for the Project Implementation Report. These activities ensure that projects are

analyzed from a system-wide perspective. The Project Delivery Team will coordinate with RECOVER on the following activities:

- **Future Without CERP Baseline** – RECOVER maintains and periodically updates the system-wide Future Without CERP Baseline. RECOVER will provide the Project Delivery Team with the latest version of the Future Without CERP Baseline for the Project Implementation Report.
- **Project-Level Performance Measures** – RECOVER has developed a set of system-wide performance measures for CERP that are used for the evaluation of alternative plans. RECOVER will review project-level performance measures developed by the Project Delivery Team to ensure that the project-level performance measures are consistent with the system-wide performance measures that RECOVER has developed.
- **Evaluation of Alternatives** – RECOVER will evaluate alternative plans developed by the Project Delivery Team from a system-wide perspective using the system-wide performance measures. RECOVER will prepare a report to be included in the PIR, in accordance with the programmatic regulations.
- **Project Monitoring Plan**s – RECOVER has developed a system-wide Monitoring and Assessment Plan (MAP) as part of the adaptive management program for CERP. The MAP provides a systematic way to monitor and assess how well CERP as a whole is achieving the benefits of the Plan. RECOVER will review the project monitoring plan developed by the Project Delivery Team to ensure that it is consistent with the MAP and does not duplicate system-wide monitoring activities.

1.8 PLAN SELECTION

Following the formulation and evaluation of alternative plans for the PIR, a tentatively selected plan will be identified. The tentatively selected plan will then be evaluated as the "next-added increment" in accordance with the programmatic regulations See Guidance Memorandum #2 for more information on formulation and evaluation and the next-added-increment analysis. In accordance with HQUSACE policies, an Alternative Formulation Briefing (AFB) will be held to obtain approval of the tentatively selected plan as the selected alternative plan for the Project Implementation Report. The selected alternative plan is synonymous with the "Preferred Alternative" or the "Preferred Plan" in the NEPA regulations (40 CFR 1500-1508).

1.9 REAL ESTATE CONSIDERATIONS

1.9.1 Lands Already Acquired for the Project

The South Florida Water Management District (SFWMD) and others have been acquiring lands needed for CERP implementation in advance of completion of a PIR, based on the April 1999 "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement". Under current USACE policy, the fair market value of lands, regardless of when

they are acquired, is used in plan formulation, in determining project costs, and for crediting local sponsors. Due to extremely high rate of appreciation of real estate values in south Florida, application of this policy for lands already acquired by the SFWMD will result in higher project costs. Moreover, the SFWMD has agreed to only request credit for the actual cost of the land needed for a project instead of what the land is worth at the time of a Project Cooperation Agreement signing. Consequently, the Project Delivery Team should use actual acquisition costs in plan formulation, cost estimating, and crediting, subject to those costs being reasonable, allocable, and allowable.

1.9.2 Cost of Real Estate As Percentage of Project Cost: Individual Projects

Current USACE policy for environmental restoration projects has a guideline that real estate costs for environmental restoration projects should not exceed 25 percent of total project costs in order to ensure that individual projects are not focusing on achieving restoration or enhancement solely through land purchase. CERP as a whole meets this policy, with real estate costs of approximately $2 billion for the $8 billion plan presented in the April 1999 "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement." However, individual CERP projects can vary widely in land costs as a percentage of total project costs. Individual CERP projects are exempted from the USACE guideline stipulating that real estate costs for ecosystem restoration projects should not exceed 25 percent of total project costs.

1.9.3 Estates Required for CERP Projects

For all lands determined to be required for CERP Projects, the interests required for implementation generally will be fee simple, based on assumptions that all or a significant portion of the rights in the land will be required for project purposes. Although fee acquisition should be the standard estate for CERP projects, lesser estates such as easements may be considered, as appropriate, if the benefits of the project can still be achieved with the lesser estate. The PIR should provide the rationale for such lesser estates.

To verify the appropriateness of fee simple acquisition, the Project Implementation Report must include the following analysis and the conclusions must be reflected in the appropriate report sections. The level of detail required for the analysis will vary depending on the project feature involved.

Determine the Rights that Are Required to Construct and Perform Operation, Maintenance, Repair, Rehabilitation, And Replacement (OMRR&R) for the Project:

- Identify the affirmative rights on the land that are required to implement the project.
- In addition to affirmative rights that may be required, identify restrictions on use (restrictive covenants) by the fee owner that are required so as not to interfere with project purposes and outputs.

- Identify the length of time that the affirmative rights or restrictive covenants are needed for the project.
- Determine whether constructed project features may need to be modified over time due to uncertainties in science, formulation, or design (adaptive management).
- Determine whether project land, or portions thereof, will be open for public use (either active or passive uses).

Other Factors to be Considered:

- Compare the cost/value of specific types of easements to fee value.
- Assess potential for severance damages from fee acquisition.
- Determine whether public owners have legal capability to convey fee.
- Assess stewardship/OMRR&R considerations regarding the risk and consequences of encroachment on project land by adjacent owners; the risk and consequences of violation of easement terms by fee owners; and monitoring and enforcement capabilities of Sponsor.
- Assess negative perception by public of private benefits or gain due to landowner reservations where easements are selected.
- Assess whether State Marketable Title Act requires re-recording of easement instruments.

1.10 CREDITING OF NON-FEDERAL SPONSOR CONSTRUCTION

The SFWMD plans to accelerate implementation of certain projects of the Plan under a program called "Acceler8." WRDA 2000 makes no provision for a credit for any work the non-Federal sponsor constructs in advance of project authorization. Therefore, credit for construction accomplished by the SFWMD in advance of project authorization requires Congressional authorization. Accordingly, each PIR should include a recommendation that Congress provide credit for work done by the non-Federal sponsor that the Secretary of the Army determines to be necessary, integral to the plan, technically sound, environmentally acceptable, and of a reasonable cost.

1.11 EXTERNAL PEER REVIEW

The programmatic regulations require that draft pilot project technical data reports and draft assessment reports for the adaptive management program be externally peer reviewed. For some PIRs, external peer review may be beneficial due to technical complexity or public concerns (e.g. aquifer storage and recovery). In those cases, a decision about conducting external peer review will be made at the Feasibility Scoping Meeting (FSM), so that external peer review can be accomplished in a timely manner. Regardless of whether external peer review is conducted, each PIR will undergo independent technical review, in accordance with USACE regulations and policy.

1.12 FEATURES TO IMPROVE WATER QUALITY

Section 528(e)(2) of WRDA 1996 (P.L 104-303) provides that the non-Federal share of the costs of features for water quality improvement will be 100 percent unless: the Secretary of the Army determines that a project feature to improve water quality is essential to Everglades restoration, then the cost share for the feature will be 50 percent, provided it is not part of the Everglades Construction Project. Subsequent to the passage of WRDA 1996, the USACE adopted guidance for implementing Section 528(e)(2) of WRDA 1996 (Water Quality Policy for South Florida Ecosystem Restoration, 7 November 1997, CECW-AG by the Director of Civil Works). This policy states that in order to qualify for Federal cost sharing, CERP features providing water quality improvement must be designated as (1) water reclamation or (2) water reuse projects. For the purpose of this USACE policy, water reclamation is defined as diverting water formerly discharged to tide or otherwise disposed to increase the volume of water available for the Everglades ecosystem restoration and water reuse is defined as modifying the use of water from its present function (e.g., flood control) in a current location to a preferred function (e.g., hydrologic restoration) in a preferred location. The April 1999 "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement" describes how this policy was applied to the projects in the Plan.

For the purpose of analyzing Federal participation in water quality features of a project, the future without condition must be developed based on the assumption that non-Federal interests will meet the requirements of the Clean Water Act and State water quality standards. The Project Delivery Team should ensure that any features necessary to improve water quality are included in the PIR in a manner consistent with the cost sharing provisions of WRDA 1996 and WRDA 2000.

1.13 PROJECT MONITORING PLAN

RECOVER has developed a system-wide Monitoring and Assessment Plan (MAP) that is an integral part of the adaptive management program for CERP. The MAP provides a systematic way to monitor key indicators throughout the South Florida ecosystem to assess how well implemented CERP projects together are performing and how well the benefits of the Plan are being achieved, including the achievement of the interim goals and interim targets. The MAP provides information for periodic assessment reports that are required by the programmatic regulations as part of the adaptive management program. Consequently, project monitoring plans should not duplicate system-wide monitoring activities that are being conducted for the MAP or duplicate elements of adaptive management program. Accordingly, the project monitoring plan for the PIR should only include activities that are necessary to:

(i.) comply with reasonable regulatory requirements (e.g. water quality standards, Endangered Species Act); and/or

(ii.)verify that the project is functioning properly and, as needed, assess project contributions to achieving benefits of the Plan.

1.14 REGIONAL MODELING ANALYSES

In addition, a number of other system-wide base conditions are needed for the formulation and evaluation process or for other required analyses. Table 1-1 describes the various baseline conditions that are needed for the PIR. Table 1-2 summarizes the various analyses for the PIR.

If the baseline conditions need to be updated, information is available from Federal, State, and local agencies and tribal governments. National and State environmental and health standards and regulations, including requirements outlined in Chapter 373 Florida Statutes, should be considered, as appropriate.

Any updating of the existing conditions inventory will be focused by the goals, planning objectives and constraints, and performance measures. The existing conditions include compiling information on significant environmental resource attributes (ecological, cultural, and aesthetic), land use, population, water demand, and operations of the C&SF Project system. The information collected serves two broad purposes: 1) To adequately describe the problems and opportunities at the project and system level; and 2) To provide enough information to characterize the significant effects and differences between the alternative plans.

1.15 DETERMINING HYDROLOGIC CONNECTIONS AND SPATIAL EXTENT OF PROJECT EFFECTS

Attachment 1-A provides a guide for Project Delivery Teams to use in: determining whether a project is hydrologically separate from the regional water management system; selecting the model used to perform evaluations; and identifying the spatial extent of the effects of a project.

Table 1-1: Baseline Conditions for PIRs

Condition	*Assumptions*	*Applications*
Pre-CERP Baseline	• Conditions on date of enactment of WRDA 2000	• Savings Clause analyses (see GM #3)
Future Without CERP Baseline	• 2050 conditions and demands • 2050 non-CERP activities • No CERP projects	• "Without condition" for formulation and evaluation of alternatives (see GM #2)
NEPA Analysis Baseline	• Actual conditions at initiation of PIR	• NEPA analysis
Next-Added Increment (NAI) Baseline[2]	• 2050 conditions and demands • 2050 non-CERP activities • Authorized CERP projects with approved operating plans at (20xx)	• "Without condition" for NAI analysis (see GM #2) • "No action" alternative • Identification of water for other water-related needs (see GM #4)
Existing Conditions PIR Baseline[1]	• (20xx) conditions and demands • Authorized CERP projects with approved operating plans at (20xx) • Non-CERP activities with approved operating plans at (20xx)	• Determine baseline water availability (see GM #2) • Identify State 373.1501 requirements[2]

Note: 20xx refers to the scheduled date of the AFB for the PIR.

[1]This model condition must be operationally "optimized."
[2]Use 20xx unless State determines that additional modeling is required.

Table 1-2: Summary of Analyses for PIRs

Analysis	*"Without Condition"*	*"With Condition"*
Screening Analyses		
Determining if Pre-CERP Baseline Water is Still Available	Pre-CERP Baseline	Existing Conditions PIR Baseline
Savings Clause Screening of Alternative Plans	Pre-CERP Baseline	Existing Conditions PIR Baseline
Formulation and Evaluation		
Formulation and Evaluation of Alternative Plans	Future Without CERP Baseline	Future Without CERP Baseline + alternative plan + rest of the Plan
Next-Added Increment Analysis	NAI Baseline	NAI Baseline + tentatively selected plan
Savings Clause Analyses		
No Intervening Non-CERP Activities	Pre-CERP Baseline	Initial Operating Regime
Intervening Non-CERP Activities	Existing Conditions PIR Baseline	Initial Operating Regime
Operating Manuals		
Project Operating Manual	N/A	Initial Operating Regime
Identification of Water		
Identification of Water for the Natural System	Existing Conditions PIR Baseline	Initial Operating Regime
"Condition A" for identifying water for other water-related needs	Existing Conditions PIR Baseline	Initial Operating Regime
"Condition B" for identifying water for other water-related needs	NAI Baseline	NAI Baseline + selected alternative plan

1.16

MAJOR PIR ACTIVITIES

There are three major groups of activities to prepare the PIR – develop base conditions and models; plan formulation and evaluation; and design selected plan. These categories are illustrated in Figure 1-1 and are described in the following paragraphs. Attachment 1-B provides more detailed information on these activities.

1.16.1 Develop Base Conditions and Models

1. Review the information provided in the Plan regarding the project's: purpose, cost, benefits, and contributions to achieving the goals and purposes of the Plan.

2. Conduct NEPA scoping to identify additional problems, opportunities, constraints, and other issues related to the project. Scoping should explore the problems and opportunities (at the local, regional, and system level), as well as describing any agency or public workshops that were held to gather additional information on the problems and opportunities. Scoping will reveal any new issues or opportunities or lead to gathering new data and information.

3. Revise the above information if needed, by developing additional problems and opportunities, project goals, and planning objectives and constraints. Confirm that all additional goals, objectives, opportunities and constraints contribute to achieving the Plan's goals and purposes.

4. Obtain the Pre-CERP Baseline, the Future Without CERP Baseline and the with CERP condition provided by RECOVER. Develop the NEPA Analysis Baseline, and the Existing Conditions PIR Baseline.

5. Update the cost of the project described in the Plan based on new information.

6. Develop project performance measures and targets, including the tools to measure changes in performance of alternative plans. The conceptual ecological models developed for the South Florida ecosystem should guide the selection of the ecological performance measures; other ecological and hydrologic performance measures should be applied as needed.

7. Conduct appropriate screening analyses to determine if the project as described in the Plan will still achieve the benefits of the project as described in the Plan in a cost-effective manner. Rough order of magnitude costs should be used in the analysis.

8. Conduct a Feasibility Scoping Meeting (FSM) meeting with Headquarters (HQ) and Office of the Assistant Secretary of the Army for Civil Works [OASA (CW)] to determine whether plan formulation should focus on optimization and detailed design of the project described in the Plan, or if additional alternative plans should be formulated. The extent of additional plan formulation will be based on whether the project as described in the Plan will

still achieve the benefits of the project as described in the Plan in a cost-effective manner. Rough order of magnitude costs should be presented for the alternatives.

1.16.2 Plan Formulation and Evaluation

1. If it is determined that the PIR effort should continue with optimization and detailed design of the project described in the Plan, then the Project Delivery Team should develop alternative design configurations to optimize the project described in the Plan. Optimization is conducted to enhance design, size and/or configuration of the project and to achieve outputs required for the system in a cost-effective manner. The Project Delivery Team will:
   a. Evaluate and compare using appropriate performance measures.
   b. Determine which of the alternative plans are considered cost-effective, based on a comparison of the selected hydrologic and ecologic outputs and their costs.
   c. Retain only cost-effective alternatives for further analysis by eliminating alternative plans that are not cost-effective.
   d. Conduct NEPA evaluation on the Next-Added Increment Baseline (i.e. no-action alternative) and all alternatives developed.

2. If additional alternative plans need to be developed, formulate additional alternatives by developing management measures at different scales or sites to meet the project's goals and purposes. The Project Delivery Team will:
   a. Evaluate and compare alternatives using appropriate performance measures.
   b. Determine which of the alternative plans are considered cost-effective, based on a comparison of the selected hydrologic and ecologic outputs and alternative plans costs.
   c. Retain only cost-effective plans for further analysis to demonstrate the efficiency (cost per unit of output) for successively larger (greater output) cost-effective plans. Based on this analysis, describe why some alternative plans were eliminated and identify the alternative plans retained.
   d. Conduct NEPA evaluation on the Next-Added Increment Baseline (i.e. no-action alternative) and all alternatives formulated.

3. Identify a tentatively selected plan based on the evaluation and comparison analyses that identifies the plan with the greatest net system-wide benefits produced by a project (as measured by appropriate outputs).

4. Conduct next-added increment analyses on the tentatively selected plan to determine the level of output or benefits that can be achieved in absence of unauthorized or unapproved CERP projects. See Guidance Memorandum #2.

5. Hold an Alternative Formulation Briefing (AFB) to obtain approval of the tentatively selected plan as the selected alternative plan.

1.16.3 Design Selected Plan

1. Complete design analyses on the selected alternative plan including:

a. Engineering design
b. Real estate information
c. M-CACES cost estimate

2. Complete additional analyses on the selected alternative plan to comply with Federal and State laws. These include:

a. Determining if there has been an elimination or transfer of existing legal sources of water. See Guidance Memorandum #3.

b. Confirming that the level of service for flood protection in existence on the date of enactment of WRDA 2000 and in accordance with applicable law will not be reduced by implementation of the project. See Guidance Memorandum #3.

c. Identifying the appropriate quantity, timing, and distribution of beneficial water for the natural system; the amount of water to be reserved or allocated for the natural system; and the quantity, timing, and distribution of water for other water-related needs See Guidance Memorandum #4.

d. Describing the project's contribution to the achievement of the interim goals and interim targets.

e. Determining compliance with applicable water quality standards and permitting requirements.

3. Compare the selected alternative plan's costs to the component's cost described in the Plan (or Section 902 cost limit for the initially authorized projects in WRDA 2000) to determine if there are any issues related to increases in cost, excluding inflation. If a cost issue exists, an IPR meeting with HQ and OASA(CW) will be held to resolve the issue.

4. Develop the draft Project Operating Manual. See Guidance Memorandum #5.

5. Develop the project monitoring plan.

6. Develop an implementation schedule for the project. Compare the project's schedule and costs to the Master Implementation Sequencing Plan. Based on this comparison, adjustments to the project's scheduling or the Master Implementation Sequencing Plan may be necessary.

7. Determine the cost sharing between the USACE and non-Federal sponsor.

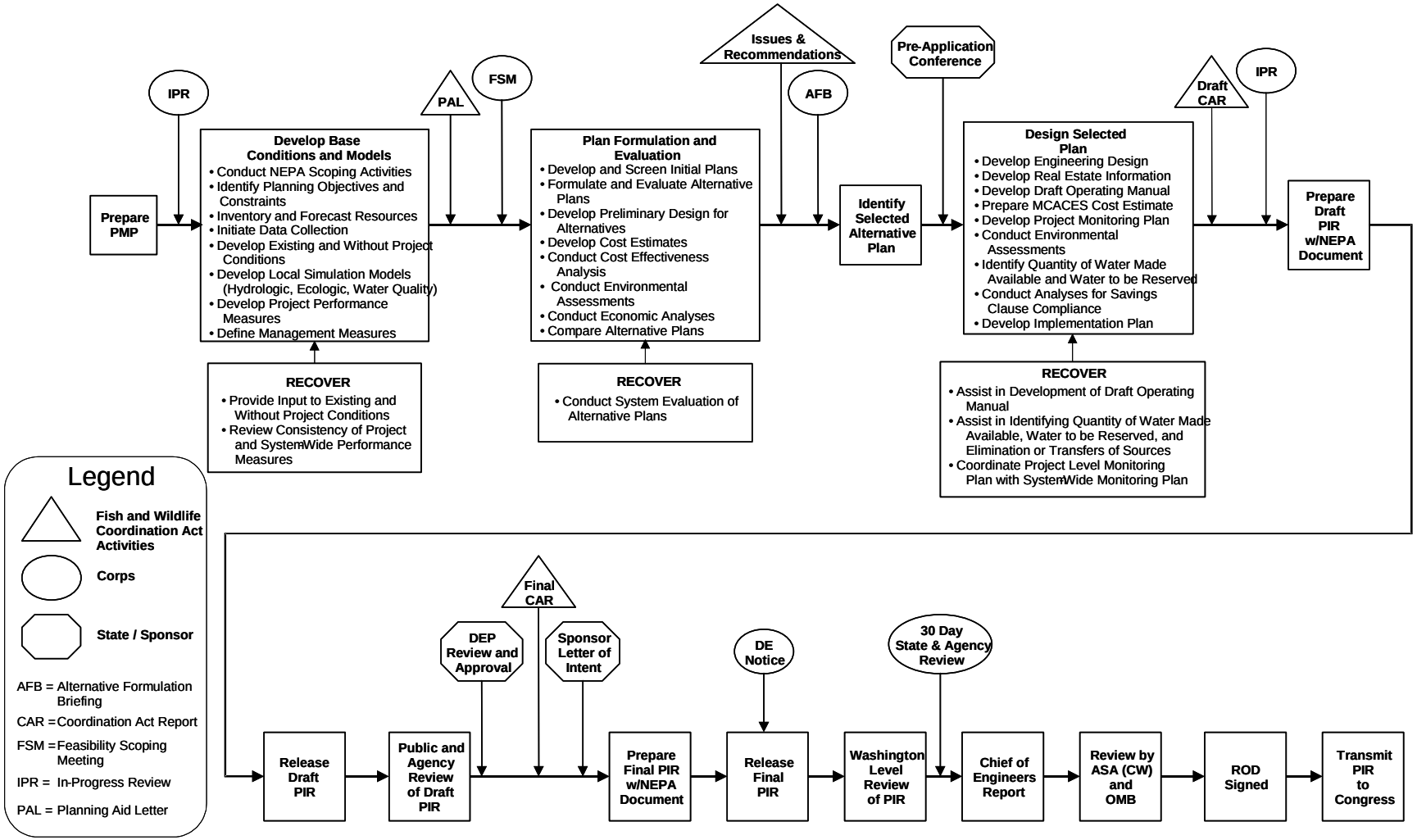
1.17 FORMAT AND CONTENT OF PIRS

The activities conducted for the Project Implementation Report (PIR) and the results of those activities will be documented in the PIR. Attachment 1-C provides an outline for the content of the PIR. The PIR must contain the detail necessary to satisfy Federal statutory requirements (e.g., NEPA), USACE regulations (e.g., USACE Engineering Regulation (ER) 1105-2-100 Guidance for Conducting Civil Works Planning Studies), CERP specific guidance (e.g., programmatic regulations), and State Laws (e.g. Section 373.1501). The information pertaining to these requirements should be included in the body of the main report or within the appropriate Annex. The Annexes of the PIR are considered an integral

part of the main report and should always accompany the main report since they contain detailed information necessary to satisfy these requirements. The Appendices include detailed technical information that may not be required by all readers and is not considered part of the main report.

The format for a PIR is standard for all CERP projects. The format is designed to facilitate the documentation of information, processes and decisions as they occur in the planning process, and includes guidelines that are specific to formulating and evaluating CERP projects (e.g., performance measures, system benefits and next added increment). Since the PIR is an integrated document, the format also provides technical information necessary to fulfill NEPA requirements.

The PIR should be prepared using the fonts, margins and spacing designated in the approved CERP Master Program Management Plan (MPMP) and USACE standards. If the MPMP is revised during development of the PIR, the MPMP standards in place at the initiation of the planning process should be used. The use of pictures, maps and graphics is encouraged throughout the document to provide visual depictions of pertinent information. In addition, to facilitate clear and concise explanation of data, information should be displayed in tabular format whenever possible.



*Additional formulation and evaluation to be conducted is commensurate with the level of detail contained within the Plan.

Figure 1-1: Typical Project Implementation Report (PIR) Process

ATTACHMENT 1-A
DETERMINING HYDROLOGIC CONNECTIONS AND SPATIAL EXTENT OF PROJECT EFFECTS

This attachment provides a guide for Project Delivery Teams to use in: determining whether a project is hydrologically separate from the regional water management system; selecting the model used to perform evaluations; and identifying the spatial extent of the effects of a project.

DETERMINE WHETHER THE PROJECT IS HYDROLOGICALLY SEPARATE.

During plan formulation and evaluation, the Project Delivery Team should determine whether the project is hydrologically connected to, or separate from, the regional water management system. Most of the components that comprise the Plan are hydrologically connected. For these projects, a hydrologic connection (i.e., surface water flow via canal discharges, sheet flow, groundwater flow, etc) exists between the components through the regional water management system (i.e., the C& SF Project and associated secondary and tertiary water conveyance structures). Hydrologic connections between projects and the regional water management system may also be created by seepage or groundwater flow. The synergistic effect of the components due to hydrologic connectedness was recognized during the initial formulation of Plan alternatives.

However, some components of the Plan are hydrologically separate from the regional water management system. Projects may be hydrologically separate for several reasons, including:

- The project does not have hydrologic connections to the regional water management system;
- The project is too small in scope to meaningfully affect the quantity of water available in the regional water management system, with the result that project effects can not be discerned with the regional modeling tools; and,
- The project does not involve substantial hydrologic alterations.

While a project may be hydrologically separate from the regional water management system, it may have effects outside of the intended footprint or basin. Guidance for determining the spatial extent of project effects is found later in this attachment. Additionally, the section on determining the spatial extent of project effects in this attachment provides guidance to the Project Delivery Team if they discover that the project results in a change to the boundary condition in the sub-regional model. When this occurs, the project can no longer be considered to be hydrologically separate.

SELECT THE MODEL TO USE TO PERFORM THE EVALUATIONS.

The type of model used is dependent upon the expected effects of the project. For those projects that will result in system-wide effects, and system-wide benefits and quantifications of water are required, a regional-scale computer model, such as the South Florida Water Management Model, should be used. However, if the project area is not covered by a regional-scale model, or if a project component is too small to be modeled by a regional scale model or is hydrologically separate from the regional water management system, sub-regional models can be used.

It is also important to identify potential regional system effects from projects that fall outside the domain of the current system-wide hydrologic model or projects that use only local project-scale models. If the project-scale modeling predicts changes to hydrology components used as boundary conditions in the system-wide model (inflows, outflow or stages), the system-wide model should be applied with the updated boundary conditions to determine the upstream or downstream effects on the water management system and natural areas. Examples include: a project in the Kissimmee Chain of Lakes area outside of the boundary of the system-wide hydrologic model that increases or decreases inflows to Lake Okeechobee, or a project in the Caloosahatchee Basin that reduces the amount of outflow that can be sent from Lake Okeechobee to the Caloosahatchee River. These changes in Lake Okeechobee flows should be analyzed with the system-wide model to determine potential system-wide effects.

Typically, hydrologic data (e.g., rainfall, surface and groundwater elevations, flow, etc.) are used in a hydrologic model to simulate the project's hydrologic, hydraulic, environmental and economic effects. Other statistical tools may also be used to evaluate project effects.

The Project Delivery Team should use the same model to evaluate alternative plans, calculate benefits, quantify water, and develop operating criteria used in the preparation of Operating Manuals. If multiple models are required such as a site-specific model and regional model, the Project Delivery Team should use the consistent boundary conditions. Selected models should also meet the following criteria:

- Simulate major components of the hydrologic cycle in South Florida including rainfall, evapotranspiration, infiltration, overland and ground water flow and their interactions, canal flow, canal-ground water seepage, levee seepage, and ground water pumping.

- Incorporate current or proposed water management operational procedures, regulation schedules, and control structures, consumptive use demands, land use, and current or proposed operational rules, consistent with the existing conditions baseline.

- Simulate effects of implementing water shortage policies on urban and agricultural water uses, and natural systems.

- Utilize a spatial resolution that is appropriate for the size of the project and expected effects.

- Reflect potential hydrologic and ecologic effects resulting from the project consistent with the agreed upon performance measures for the project.

- Utilize time steps that permit the evaluation of changes in timing, which is particularly important for analyses required in Guidance Memorandum #3 and Guidance Memorandum #4.

- Affirm the State and Federal assurance requirements pertaining to existing legal sources (users), level of service for flood protection, and existing legal users.

- Incorporate boundary conditions from the regional scale model.

- The time series of data (beginning with the date of the first data point through the date of the last data point) that comprises the full range of known conditions constitutes the period-of-record for undertaking this analysis. The longest historic period available (currently 36 years) of daily simulated values are recommended for the analysis. If a shorter period is used, the full range of hydrologic conditions must be represented including inter- and intra- annual variations due to droughts, periods of high and low water levels and natural fluctuations. An appropriate period-of-record will include natural fluctuations in rainfall and water levels, including droughts and periods of high water levels. Uncertainty about the adequacy of the data for compiling an appropriate period-of-record should be reflected in project documents. All simulations considered should use the same period of climatic record.

IDENTIFY AND DESCRIBE THE SPATIAL EXTENT OF THE EFFECTS OF THE PROJECT.

The Project Delivery Team is responsible for identifying the spatial extent of project effects for quantifying benefits of the project, performing savings clause evaluations, and quantifying water made available by the project within that geographical boundary. This should be done for all projects regardless of whether the project is hydrologically separate from the regional water management system. Even though they may not affect the regional system, hydrologically separate projects may have effects outside of the intended footprint or basin in which they reside.

Projects may result in changes in water availability for the natural system and other water-related needs in two general ways:

1. <u>System-wide effects</u>

   Hydrologic effects that occur outside of the watershed or basin in which the project is located through the storage, management, treatment, and delivery of water via the regional water management system.

2. Project-level effects

Hydrologic effects that occur within the watershed or basin in which the project is located (e.g., natural areas, wetlands, salinity control) or within the features of project components (e.g., reservoirs, storm water treatment areas, wellfield recharge distribution canal).

The Project Delivery Team should identify benefits, perform savings clause analyses, and quantify water made available by the project on both a system-wide (or regional, if applicable) and project-level scale.

Projects may affect the spatial distribution of water on a system-wide level by causing a change in stage, duration of stage, timing, or flow volume in water delivered to, retained in, or discharged from the natural system or delivered for other water-related needs via hydraulic connection to the system-wide water management system. An example of a system-wide effect is a project that is designed to retain water in Loxahatchee National Wildlife Refuge (WCA 1) to meet hydrologic targets, which may then result in a change in stage, duration of stage, or flow in Lake Okeechobee, WCA 2A, WCA 3A, and Everglades National Park. Such effects on the system-wide spatial distribution of water may be small in magnitude; however, it is important to remember that these small changes in stage in the natural system represent large total volumes of water. Regardless of magnitude, system-wide effects due to hydrologic changes are inherent in the hydraulic interconnectedness of many of the components of CERP and should be reflected in the evaluation of system-wide effects of the project using a system-wide hydrologic model (e.g., SFWMM).

The second type of effect on the spatial distribution of water by projects for the natural system or for other water-related needs is the change in spatial and temporal distribution of water availability in the immediate vicinity of the project as a result of the design and operation of project features. Examples of project-level effects resulting from a project include management measures such as diversion of flow from one stream or canal reach to another to restore a target hydrologic regime or the construction of spreader swales to change a canal (point-source) discharge to a more diffuse flow across a natural area boundary. In these cases, a transect along a boundary can be used to measure changes in spatial distribution, and the average annual flow across the transect at an appropriate spatial resolution should be reported.

Determining the spatial extent of project effects is done by first identifying the basins or watershed where the project is located and where other structural or operational changes occur. These are the basins in which the Project Delivery Team should look for project-level effects. Next, the boundary fluxes for those basins or watersheds are compared against the without project simulation. If the boundary fluxes did not change, the Project Delivery Team can assume that areas or regions outside of the basin in which the project resides are not affected and do not need to be analyzed. However, if changes in the boundary fluxes were observed, the Project Delivery Team must then progressively evaluate the boundary fluxes for the adjacent basins or watersheds until they reach one where the fluxes remain constant. Modeling results should be evaluated to look for project effects in each basin or watershed in

which the Project Delivery Team identified boundary flux changes. These are potential areas in which the CERP project may produce effects.

If the Project Delivery Team uses a sub-regional model, the same boundary flux method should be employed with one additional step. If the boundary fluxes at the boundary of the model change, these changes should be fed back into the regional model to determine how far the changes propagate throughout the regional system. This is also an indication that the project is hydrologically connected to the regional water management system and has system-wide effects.

ATTACHMENT 1-B
OVERVIEW OF MAJOR PIR ACTIVITIES

This attachment provides more detailed information about the major activities that are to be conducted and documentation that is needed to complete a Project Implementation Report (PIR). The three major categories of activities are: develop base conditions and models; plan formulation and evaluation; and design selected plan. This content will be documented within the PIR as outlined in Attachment 1-C.

I. DEVELOP BASE CONDITIONS AND MODELS

Each component or project of the Plan has previously been formulated to a certain level and the component or project has been developed to accomplish specific CERP goals. As such, formulation in the PIR always begins with the formulation already completed in developing the Plan. The Project Delivery Team should extract the information from the Plan documents and continue the formulation and evaluation necessary to complete the Project Implementation Report. In most cases, it is envisioned that this process will entail optimization of the component detailed in the Plan. However, in some cases, additional formulation may be needed.

A. Project Purpose and Need

State the purpose, background, and contextual setting of the project as described in the Plan, and describe how this individual project is linked to the system by providing system-wide, regional and project area and benefit descriptions. This information will be found in the Plan or other previous studies and will be compiled, summarized and updated, if necessary.

1. Purpose and Background

CERP Overview - Provide a brief overview of the Plan. Explain how this project fits into the Plan and helps achieve system-wide goals and purposes. Include a description of project authorization, if applicable.

Project Purpose - Explain CERP goals and purposes that apply to this project and the project-specific objectives as described in the **"**Final Integrated Feasibility Report and Programmatic Environment Impact Statement" dated April 1, 1999, or subsequent Plan documents, and if necessary, explain any changes in the project's scope since the completion of the Plan.

CERP Partnership and Cooperating Agencies - Describe the USACE and non-Federal sponsor partnership for this project. Explain the roles of cooperating agencies and other stakeholders.

Relationship to Other USACE/Non-Federal Sponsor Efforts, Studies, Documents, and Projects - Describe other ongoing and completed efforts or research that pertains to this project or the CERP component.

2. Project Need and Setting

Pre-CERP Conditions - Describe the conditions in the South Florida ecosystem that existed prior to implementation of CERP. This information should be available in the Plan documents.

Project Area - Describe the location and boundaries of the project area, and explain in general terms the resource concerns in the project area.

B. Identify Problems and Opportunities, Objectives and Constraints, and Evaluation Criteria

In this section of the PIR, identify the issues and concerns of the area and provide a description of the coordination and involvement that was included to accomplish the scoping of problems and opportunities; identify the objectives and constraints, and performance measures for the project.

Note: Problems and opportunities, as well as planning objectives and constraints, should already be defined in the Plan. PIRs should only address those objectives and constraints, plus additional issues that came out of scoping with public, agency, and stakeholder involvement. Use of a table to depict this information is advised. Discuss the development of additional objectives beyond those described in the Plan.

1. Identification of Problems and Opportunities

Existing Information from the Plan - Discuss the problems and opportunities as described in the Plan documents.

Scoping Problems and Opportunities - Describe the scoping process used to explore the problems and opportunities (at the local, regional, and system level), as well as any agency or public workshops that were held to gather additional information for the problems and opportunities. Describe the range of problems and opportunities that were explored for this PIR. Explain why issues were either eliminated or retained for consideration in this PIR.

Additional Information Collected - Explain how scoping identified any new issues or opportunities. Explain how they were refined or changed, if applicable. Describe any new data or information collected by the Project Delivery Team to fill in any data gaps for the identification of the problems and opportunities, such as other types and sources of

background and existing information available, pertinent documents, reports or articles the Project Delivery Team reviewed.

Problem and Opportunity Statements - List the problem and opportunity statements for the PIR.

2. Identification of Planning Objectives and Constraints

Planning Objectives and Constraints from the Plan - Discuss the planning objectives and constraints described in the Plan.

Scoping Objectives and Constraints - Describe the scoping process used to explore the planning objectives and constraints at the local, regional, and system level. Explain how the objectives and constraints link to resolution of a problem or achievement of an opportunity. Show how objectives lead to achievement of project goals. Show how the project planning objectives and constraints relate to system-wide performance measures. Explain why issues were either eliminated or retained for consideration in the PIR.

Identify the Project Goals - Based on the Plan's goals and problem and opportunity statements described earlier, state the project goal(s) to be achieved.

Planning Objectives and Constraints - List the planning objectives and constraints adopted for the PIR.

3. Development of Project Evaluation Criteria

Description of Evaluation Criteria Selection Process - Explain the process for developing the project performance measures, including the tools used to calculate the results. Include a description of other evaluation criteria the Project Delivery Team plans to use to evaluate alternative plan performance. Differentiate between quantitative, measurable performance measures and targets, and qualitative evaluation criteria.

Relationship to Planning Objectives and Constraints - Provide a display (e.g., table or chart) that shows the relationship between each performance measure and evaluation criterion, and the planning objectives and constraints for this project.

Relationship to CERP System-Wide Performance Measures - Provide a display (e.g., table) that shows the relationship between system-wide performance measures developed by REstoration COordination and VERification (RECOVER) and any project performance measures developed by the Project Delivery Team. This should include a summary of any coordination that was conducted with RECOVER.

Relationship to Interim Goals and Interim Targets - Describe any linkages between project performance measures and the interim goals and interim targets.

4. Choosing Evaluation Methods and Models

Investigation of Evaluation Methods and Models - Briefly explain the process the Project Delivery Team followed to research and investigate viable methods and models to evaluate alternative plan benefits. List the models and methodologies considered by the team and discuss selection criteria.

Overview of Selected Methods/Models - Describe the evaluation methodology selected for the PIR, and reasons for its selection. Include a discussion of its relationship to the system and project-level performance measures. Furthermore, describe the benefits that will be measured for this PIR and explain how the benefits relate back to the planning objectives, and problems and opportunities.

C. Existing and Future Without Conditions of the Area

In this section of the PIR, the Project Delivery Team will describe: 1) the existing conditions (NEPA Analysis Baseline and Existing Conditions PIR Baseline); 2) forecasted conditions in the future if CERP is not implemented at all (Future Without CERP Baseline); 3) the forecasted conditions in the future if all of the Plan is implemented; and 4) the forecasted conditions in the future, if no further CERP projects are approved (Next-Added Increment Baseline). Provide information that allows the reader to visualize the surroundings that are part of the project area, as well as the regional and system-wide area.

Existing Conditions - Describe the general existing conditions of the project area, region, and system (NEPA Analysis Baseline and Existing Conditions PIR Baseline). Note the difference between the NEPA Analysis Baseline and the Existing Conditions PIR Baseline (see Table 1-1). Include a discussion of resource usage and demands. Describe the CERP projects that have been authorized with approved operating plans and the non-CERP activities with approved operating plans. Effective use of maps, tables, graphs, charts, and pictures is important.

Overview of Without CERP Baseline - Describe the system-wide conditions at the end of the period of analysis without implementation of any of the projects of the Plan. This information is available from RECOVER.

Overview of With CERP Condition - Describe the system-wide conditions at the end of the period of analysis assuming implementation of all of the projects of the Plan. This information is available from RECOVER.

Overview of Next-Added Increment Baseline - Describe the local, regional, and system-wide conditions at the end of the period of analysis (and several points along the way), assuming CERP projects already authorized are in place, but no other CERP projects are implemented. Forecast and summarize resources. This summary should depict the general

state of resource conditions, usage, and demand. Use maps and graphics to help whenever possible.

Availability of Baseline Water - Describe the availability of Pre-CERP Baseline water for the natural system.

Consideration of Existing Water Reservations – Describe any existing reservations of water made under State law either for CERP or for non-CERP activities.

Comparison of Significant Resources in the Existing and Future Without Conditions - Describe and quantify, as appropriate, the current and future resources without the proposed project in place. Show how the existing state of significant resources compares to the state of significant resources at several points throughout and at the end of the period of analysis. A table is recommended to compare resources (which may include hydrology; water management; physical landscape; water resources; water supply; flooding; navigation; water quality; natural environmental; threatened and endangered species; essential fish habitat; socio-economic setting; land uses; cultural/historical resources; climate/weather; air quality; noise; recreation; aesthetics; hazardous, toxic and radioactive wastes; and transportation and other infrastructure).

II. PLAN FORMULATION AND EVALUATION

A. Plan Formulation

Determine whether plan formulation should focus on continuing with detailed design of the alternative described in the Plan (optimization) or if additional plans should be formulated. Formulation and evaluation procedures are discussed in Guidance Memorandum #2.

1. Optimizing the Alternative Defined in the Plan

The Project Delivery Team will describe the development of design alternatives to optimize the project described in the Plan. Such optimization alternatives might include incremental changes in component size, configuration, or specific location.

2. Formulation of Additional Plans

When additional alternatives need to be formulated to meet the planning objectives, describe the process the Project Delivery Team followed when developing management measures and alternative plans. This section should describe the process for generating the alternatives for achieving the planning objectives and performance measure targets that were established earlier in the planning process. Identify the screening criteria used in order to eliminate management measures and alternative plans at this point in the planning process. Describe how the screening criteria were applied and clearly describe why those screening criteria were appropriate to use at this point in the process. Be sure to discuss any and all iterations of screening and selection. A flowchart may be useful.

Alternative Plan Described in Comprehensive Plan - Describe the project that was included in the Plan. Also, explain how well the project does (or does not) achieve the benefits of the project as described in the Plan based on current conditions. Describe any new or changed circumstances; conditions or other considerations that may affect project performance. For example: project conditions and objectives may have changed since the Plan was approved; new scientific research may have provided new information regarding project goals, objectives or feasibility; or adaptive management activities may indicate new or changed needs.

Development of Management Measures - Document the ideas developed for operational, structural, and non-structural measures (include a list of all three types of management measures) to meet the planning objectives and constraints and CERP goals and purposes. Describe the information used, and who was involved (e.g. stakeholder/team involvement, public input).

Development of Screening Criteria - Describe the screening criteria developed based on performance measures and project objectives and constraints, and include what information was used, how values were set for each screening criteria and who was involved (e.g. stakeholder/team involvement, public input). Describe how system-wide performance measure targets were considered in screening criteria development. Describe the application of the screening criteria and provide lists of management measures or features eliminated and management measures or features retained for further consideration.

Organizing Measures into Alternative Plans - Document the process of organizing, linking and combining management measures to create alternative plans. List the alternative plans formulated and show how each alternative plan performs with respect to the screening criteria applied at this point. Identify the screening criteria applied and explain how the Project Delivery Team used them to determine which alternatives would be eliminated and which would be retained for further consideration. A table format may be useful. Be sure to

document the relationship of each alternative plan to the planning objectives and constraints, and consideration of CERP system-wide performance measure targets.

Alternative Plans Eliminated from Further Evaluation - List the alternative plans eliminated from further analysis. Explain the reasoning for elimination using screening criteria results.

Alternative Plans Retained for Further Evaluation - Describe the alternative plans retained for further consideration in the planning effort. Provide screening criteria results and interpretation.

B. Evaluation of Alternative Plans

In this section, document the evaluation of the changes each alternative plan would make when compared to the Future Without CERP Baseline. It is this difference between the Future Without CERP Baseline and the future with each alternative plan that defines the outputs or benefits of the alternative plan. See Guidance Memorandum #2 for specific information about the evaluation process.

Describe in sufficient detail how the changes in future with conditions are related to project objectives. This is not an absolute comparison. It is likely that each alternative plan will have differing levels of success for each objective and performance measure. It is important to reflect those differences, since that will aid the selection of the final alternative plan from the group of likely candidates.

Describe the process by which alternative plans were evaluated, making sure to discuss any and all iterations. A table may be an effective way to display this information.

Overview of Future Conditions with Each Alternative Plan - Concisely describe the general conditions of the project area, region, and system in the future with each alternative plan in place. This summary should depict the overall state of the resource conditions, usage and demands that are predicted and likely for the period of analysis for this project. Use of maps and pictures is encouraged to assist in describing the future with conditions for each alternative.

Comparison of Significant Resources (Alternative Plans vs. Future-Without CERP Baseline) - Describe and quantify, as appropriate, the different future with and without conditions for significant resources. Furthermore, show how the state of significant resources in each alternative plan compares to the state of significant resources in the future without condition. Table format is recommended for reflecting this comparison across resources (e.g. hydrology; water management; physical landscape; water resources; water supply; flooding; navigation; water quality; natural environmental; threatened and endangered species; essential fish habitat; socio-economic setting; land uses; cultural/historical resources; climate/weather; air quality; noise; recreation; aesthetics; hazardous; toxic and radioactive wastes; transportation and other infrastructure; cumulative impacts; unavoidable adverse

effects; relationship between short term uses and long term productivity; irreversible or irretrievable commitments of resources; and benefits associated with alternative plans). RECOVER will prepare an evaluation of the alternative's contribution towards achieving the system-wide goals and purposes of CERP, including, as appropriate, suggestions for improving the performance of he selected alternative plan. The RECOVER evaluation will be included in the PIR as required by the programmatic regulations.

Savings Clause Considerations - While the required Savings Clause analysis will be conducted on the selected alternative plan, the Project Delivery Team should consider any major potential Savings Clause issues that have been identified for each alternative plan evaluated at this point. Guidance Memorandum #3 provides details on the Savings Clause analyses.

C. Comparison of Alternative Plans

In this section, describe the outcome of comparing all of the alternative plans to each other to identify the differences among the alternative plans. Describe the relationships between outputs and the alternative plan costs. Conduct cost-effectiveness and incremental cost analysis, as appropriate.

1. Alternative Plan Comparison

Alternative Plan Achievement of Objectives - Describe each alternative plan's degree of achievement of planning objectives and performance targets (table is recommended). Include sufficient detail to show differences in performance between alternative plans. If performance measures are too coarse to show differences, the Project Delivery Team should document this and describe other potential performance measures or methods of determining differences between plans.

Alternative Plan Effects - Compare benefits and achievement of evaluation performance measures for alternative plans. Identify the resources (if any) that may be adversely affected. Explain how various benefits relate to the quality of the intended project outcome. Document if trade-offs occur in the attainment of one or more planning objectives. Discuss the consequences of trade-offs and relative importance of each objective affected.

Alternative Plan Contributions Towards Achievement of Interim Goals and Interim Targets - Describe and compare how each alternative plan contributes to the achievement of the interim goals and interim targets.

Significance of Ecosystem Outputs - Describe the significance, from a planning perspective, of ecosystem outputs each alternative plan would produce. Along with other evaluation techniques, this information will help determine whether the proposed project is worth the cost, and whether a particular alternative should be recommended. Significance should be described in terms of institutional, public and/or technical importance. Basis for such significance includes: (1) acknowledgment of output importance in laws, policies and

adopted plans; (2) volunteer or financial support or cultural veneration of a resource by a segment of the general population; (3) scarcity, limiting nature to survival/recovery of species, connectivity, recoverability, declining status or downward trend, and biodiversity of the ecosystem outputs.

Alternative Plan Comparison - Based on the information presented previously, describe the process for elimination of certain alternative plans (if any) from further comparison and list the alternative plans retained for further consideration. Include a discussion of the four Principles and Guidelines Criteria (completeness, effectiveness, efficiency, and acceptability) and the degree to which each alternative plan satisfied them. A table may be useful for this purpose. Discuss alternative plans that were eliminated based on this analysis.

Costs of Alternative Plans - Provide the construction cost estimates of each plan feature, as well as other costs associated with implementation, operation and maintenance of each alternative plan.

2. Cost-Effectiveness/Incremental Cost Analyses of Alternative Plans

Overview of Cost-Effectiveness Analysis - Determine which of the alternative plans are considered cost-effective, based on a comparison of the ecological outputs (or surrogates, if necessary) they provide and their costs. Only cost-effective alternative plans should be retained for further analysis. Based on this analysis, describe why some alternative plans were eliminated and identify the alternative plans retained.

I**ncremental Cost Analyses of Alternative Plans -** In cases where additional alternative plans other than the optimized component from the Plan have been developed, an Incremental Cost Analysis (ICA) is necessary to evaluate each alternative plan. Calculate incremental costs and incremental outputs for the cost-effective alternative plans to determine that they are "best buy" alternatives (e.g., greatest return of ecological outputs or surrogates if necessary for a given level of investment). The ICA will be necessary to demonstrate the efficiency (cost per unit of output) for successively larger (greater output) cost-effective plans. If all of the alternative plans yield identical outputs, cost-effectiveness analysis (which identifies the least cost alternative plan) will be the critical procedure. The ICA would be limited in this case to demonstrating the efficiency of the single "best buy" alternative plan.

3. Trade-Off Analysis

Describe any trade-offs that are being evaluated among the benefits associated with the planning objectives (and performance measures).

4. Risk and Uncertainty Analysis

Level of Risk and Uncertainty - Determine the level of risk or uncertainty that is associated with any factor of an alternative plan (e.g., structural integrity, land suitability, and ecological return). In addition, identify any uncertainties associated with assumptions made during the

planning process, predictions of future conditions, models and methodologies employed, cost estimates, etc. The uncertainty analysis should be as quantitative as feasible. A tabular format may be helpful. It is important for decision makers to know where the sources of greatest uncertainty lie. Describe any risks foreseeable to the achievement of project goals if assumptions or predictions are inaccurate, or if structural or operational problems arise.

Sensitivity Analysis - If the findings of the risk and uncertainty analysis indicate a significant level of risk or uncertainty associated with parameters of certain alternative plans, a sensitivity analysis should be performed. A sensitivity analysis will help decision makers estimate the magnitude of the effect on plan performance that a change of a given parameter would make. If, for example, a slight change in ecological relationships would result in a huge difference in project performance, the Project Delivery Team should document this fact.

D. Plan Selection Process

> Explain how the selected alternative plan was selected from the final array of alternative plans. Explain the results of cost effectiveness/ incremental cost analyses (CE/ICA) and other significant conclusions resulting from comparison of the final array of alternative plans. Describe selection criteria used and how they reflect the planning objectives and performance measure targets. Explain how selection criteria were applied. In addition, provide information on project implementation; including costs, general schedule, and Federal and non-Federal sponsor responsibilities.

Integration of Planning Objectives and Performance Measures - Explain the information used to establish and set values for selection criteria for selection of the plan from the final array of alternative plans. Criteria may include such things as achievement of planning objectives, the degree of risk or uncertainty that is acceptable, achievement of performance measure targets and the necessity of undesirable trade-offs. Explain how the criteria were applied and how each alternative plan was rated. Use of tables or charts may be helpful to display information.

Other Criteria Considered for Plan Selection - Describe any other criteria used to choose the selected alternative plan. Such criteria will be unique to each project but may include such things as achievement of Principles and Guidelines criteria, land availability, public preference, achievement of interim goals and interim targets, incidental benefits, mitigation requirements, or compatibility with other CERP or C&SF Project system features.

Justification - In addition to USACE requirements for project justification, the PIR must demonstrate that each project is justified on a next-added increment basis. Describe benefits if this increment were the last one implemented, in addition to those already authorized. Include an analysis of next-added increment (Guidance Memorandum #2 provides additional information on the next-added increment), system-wide benefits, and achievement of system-wide performance measures and targets.

III. DESIGN SELECTED PLAN

A. Selected Alternative Plan Description

Selected Alternative Plan Features and Actions - Describe in technical detail the specific features and of the selected alternative plan. Include a clearly labeled project drawing and map showing the project location and context. Include any other graphics, charts or photographs necessary to provide the reader with a clear and accurate understanding of the selected alternative plan's features.

Selected Alternative Plan's Contribution Towards Achieving CERP Goals and Purposes - Show that the selected alternative plan is an integral part of the Plan and describe its contribution to achievement of the goals and purposes of the Plan.

Selected Alternative Plan's Contribution to Achievement of Interim Goals and Interim Targets - Describe how the project contributes to the achievement of interim goals and the interim targets established according to the programmatic regulations.

Relationship to Problems and Opportunities Statements - Demonstrate that the selected alternative plan effectively addresses the problem and opportunity statements developed earlier in the planning process.

Relationship to Planning Objectives and Constraints - Describe the relationship of selected alternative plan to the planning objectives and constraints.

Project Operating Plan - Provide summary information from the Draft Project Operating Manual that is included as an annex to the PIR. See Guidance Memorandum #5 for additional guidance on Operating Manuals.

Project Monitoring Plan - Describe the monitoring activities that will be conducted for this project. Only those monitoring activities needed to ensure that project features perform as designed or to comply with regulatory requirements should be included.

Selected Alternative Plan Costs - Provide a general breakdown of all the costs associated with the selected alternative plan. Include costs for: construction; lands, easements, relocations, rights-of-way and disposals (LERRDs)**;** operations and maintenance, repair, rehabilitation, and replacement (OMRR&R); and project monitoring.

Permits, Entitlements, Certifications, Etc. - List all of the necessary permits, certifications, and entitlements that are required to construct and implement the selected alternative plan. Describe any actions taken to begin the procurement or application processes for such permits and certifications. Describe actions still to be taken.

Mitigation and Environmental Commitments - List any commitments that have been made by any agency in order to implement the project. Describe the specific mitigation

actions that may be required to implement this project. Show that the mitigation is justified. The resources for which mitigation is required should also be described clearly.

B. Project Assurances

Address Federal and State requirements unique to CERP Project Implementation Reports as required by WRDA 2000, the programmatic regulations, and State Statutes.

Elimination or Transfer of Existing Legal Sources of Water - Determine if implementation of the selected alternative plan would result in the elimination or transfer of an existing legal source of water (see Section 385.36(a) of the programmatic regulations). If the Project Delivery Team determines that implementation of the project will cause an elimination or transfer of existing legal sources of water, then the PIR will include an implementation plan that ensures that such elimination or transfer will not occur until a new source of water of comparable quality and quantity is available. Guidance Memorandum #3 provides further guidance on how to conduct these analyses to determine if transfers or elimination of existing legal sources of water will occur as the result of implementation of the project.

Project Effects on Level of Service for Flood Protection - As required by the Savings Clause of WRDA 2000, appropriate analyses must be conducted to demonstrate that the levels of service for flood protection that: (1) were in existence on the date of enactment of Section 601 of WRDA 2000; and (2) are in accordance with applicable law, will not be reduced by implementation of the project. See Guidance Memorandum #3 for details on the evaluation of levels of service for flood protection required for the Savings Clause.

Identification of the Appropriate Quantity, Timing, and Distribution of Water to Achieve the Benefits of the Plan - Guidance Memorandum #4 provides a detailed discussion of: 1) the identification of the appropriate quantity, timing, and distribution of beneficial water for the natural system; 2) identification of the amount of water to be reserved for the natural system; and 3) the quantity, timing and distribution of water for other water-related needs.

Compliance with Applicable Water Quality Standards and Permitting Requirements - The Florida Department of Environmental Protection (FDEP) is responsible for issuing Water Quality Certification (WQC) and/or State permits for CERP Projects. The Project Delivery Team should work to provide as much detail as possible about the construction and operation of the selected alternative plan to facilitate timely issuance of the WQC and/or State permits.

Compliance with Florida Statutes - Section 373.026(8)(b), Florida Statutes (F.S.), requires that prior to submitting a PIR to Congress for authorization or receipt of an appropriation of State funds for construction of a CERP project, the FDEP must first approve the project component. Section 373.470, F.S., requires that prior to executing a Project Cooperation Agreement with the USACE, a PIR must contain sufficient information to receive FDEP approval under Section 373.026(8)(b), F.S. In order to receive approval of the project

component by the FDEP, the SFWMD must provide documentation to demonstrate compliance with the criteria set forth in Section 373.1501(5), F.S.

D. Implementation of the Selected Plan

Schedule - Provide the timeline for implementing the features of the selected alternative plan, explain any relationship between the implementation of the different components (e.g., dependencies) and describe any specific time-of-year requirements associated with any features of the selected alternative plan.

Costs: Engineering and Design, Construction, LERRDS, OMRR&R - Provide all the costs associated with the items and tasks listed in the schedule.

Cost-Sharing - Provide the cost breakdown over the duration of the implementation period between the USACE and non-Federal sponsor(s). If cost-sharing of water quality features is recommended, it should be explicitly stated here. Such statements must also show that any features to improve water quality are implemented in a manner consistent with the cost-sharing provisions in WRDA 1996 and WRDA 2000.

Summary of Federal/Non-Federal Implementation Responsibilities - Based on the schedule and costs reflected, explain each party's responsibilities for implementation. This will include the Federal and non-Federal sponsors, and will sometimes also include other agencies.

Unresolved External Issues - Describe the unresolved external constraints and factors, if any, that may affect project implementation (e.g., land use, land ownership and management issues) as well as other risk factors for the project. Present any issues that are outside the purview of the USACE or non-Federal sponsor's authority, including issues discussed but determined to not be relevant to the project purpose.

ATTACHMENT 1-C
PROJECT IMPLEMENTATION REPORT OUTLINE

*Cover Page and Abstract

*Executive Summary

PIR/NEPA Organization and Layout

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- c. Existing Conditions and Future Without Conditions of the Area
  - i. Determining Existing and Future Without Conditions
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*Alternative Optimization and/or Development of Additional Alternatives
- a. Optimizing the Alternative Defined in the Plan; ***or*** Establishing Management Measures, Development of Alternative Plans, and Screening
- *b. Evaluation of Alternative Plans
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  - ii. Relationship of Alternative Plans to PIR Goals and Planning Objectives
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Recommendations

*NEPA Index

Acknowledgements

*List of Project Delivery Team Members and Report Preparers

*Glossary of Terms

*References

ANNEXES

ANNEX A – Fish and Wildlife Coordination Act and Endangered Species Act Compliance
Planning Aid Letters (FWS, FWC)
Coordination Act Reports (FWS, FWC, Draft, supplements, final)
Listing of Threatened and Endangered Species, EFH, critical habitat, etc. (State and Federal)
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ANNEX B – NEPA Information
Compliance with Environmental Laws
Pertinent Correspondence
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References

Draft & Final Report recipients

ANNEX C – Legislative and Statutory Requirements

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ANNEX D – Draft Project Operating Manual

ANNEX E – Reports and Information Provided by RECOVER

APPENDICES

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B Engineering
C Cost Estimates
D Environmental Information (ecosystem model data, habitat unit decisions)
E Real Estate
F Agency/Public Coordination
G Economic and Social Conditions
H Recreation

* Elements marked with an asterisk (*) are required for NEPA compliance according to CEQ Regulations.

SECTION 2: GUIDANCE MEMORANDUM #2 FORMULATION AND EVALUATION OF ALTERNATIVE PLANS FOR PROJECT IMPLEMENTATION REPORTS

2.1 PURPOSE

The programmatic regulations for the Comprehensive Everglades Restoration Plan require that a guidance memorandum be developed to "describe the processes to be used to formulate and evaluate alternative plans and their associated monetary and non-monetary benefits and costs, determine cost-effectiveness and optimize the project's contributions towards achieving the goals and purposes of the Plan, and the basis for justifying and selecting an alternative plan to be recommended for implementation…" and "… provide a process for evaluating projects that are outside the boundary of regional computer models or projects whose effects cannot be captured in regional computer models."

In addition, the programmatic regulations include other provisions related to formulation and evaluation that need to be addressed in this guidance memorandum. These areas include:

- Describing a process for including each alternative plan with all the other components of the plan;
- Evaluating the total monetary and non-monetary benefits and costs of the resulting comprehensive plan when compared to the without CERP condition; and
- Describing the process for identifying the tentatively selected plan, as well as evaluating the tentatively selected plan as the next-added increment.

This guidance memorandum provides information for Project Delivery Teams about the formulation and evaluation of alternatives for Project Implementation Reports.

2.2 APPLICABILITY

This guidance memorandum applies to Project Implementation Reports (PIRs) for all CERP projects and provides additional information on the plan formulation and evaluation activities described in Guidance Memorandum #1. There may be differences in the level of detail included in each PIR based on specific situations. For example, the amount of detail necessary to complete the formulation and evaluation for the PIR, the extent of previous formulation, the planning research activities, and/or the design detail may differ from project to project.

2.3 FORMULATION AND EVALUATION PRINCIPLES FOR PIRS

The programmatic regulations require that alternative plans be formulated and evaluated to optimize the project's contributions towards achieving the goals and purposes of the Plan,

and to develop justified and cost-effective ways to achieve the benefits of the Plan. Prior to the initiation of the PIR development process, the Project Delivery Team needs to have an understanding of certain principles that will provide the framework for the formulation and evaluation activities that are to be conducted for a PIR.

2.3.1 Updating Goals; Problems and Opportunities; Objectives and Constraints; Evaluation Criteria; and Performance Measures

As described in Guidance Memorandum #1, the initial step in the PIR process, developing base conditions and models, involves reviewing and collecting the project information from the contextual setting of CERP. Goals, problems and opportunities, and planning objectives and constraints should be directly taken from the Plan. Upon completion of scoping with agencies and the public on the previously developed criteria, the Project Delivery Team should identify any new issues, conditions, etc, that may require additional goals, problem and opportunity statements, or objectives and constraints for the project. RECOVER should be consulted regarding any additional problems and opportunities that may have been identified related to the project on a system-wide basis. In developing any new evaluation criteria, it is incumbent on the Project Delivery Team to ensure that the new evaluation criteria still meet the intent of the Plan.

Evaluation criteria and performance measures that are used in the PIR process should be consistent with the goals and planning objectives of the projects. To evaluate system-wide effects of projects, the system-wide performance measures developed by RECOVER should be used to the greatest extent possible. Contributions toward the achievement of the interim goals and interim targets should also be used in project evaluation. Depending on the scale of the project and the scope of formulation, project-level evaluation criteria and performance that are consistent with the RECOVER system-wide performance measures should be identified and developed.

2.3.2 Use Actual Acquisition Costs in Plan Formulation, Cost Estimating, and Crediting

As described in Guidance Memorandum #1, the Project Delivery Team should use actual acquisition costs in plan formulation, cost estimating, and crediting subject to those costs being reasonable, allocable, and allowable. For those projects where the non-Federal sponsor has already acquired lands, formulation of alternative plans using other sites will be minimized if the intended project purposes can be achieved and no more cost-effective sites are identified during formulation.

2.3.3 Period of Analysis

The period of analysis for calculating the benefits and associated costs for a project will begin the year in which the project will be functional (base year). The end-point for the period of analysis used in a PIR will coincide with the period of analysis end-point used in the most current version of the Plan (e.g. the April 1999 “Final Integrated Feasibility Report and Programmatic Environmental Impact Statement” used 2050). This end-point consistency

is necessary for calculation of system-wide benefits. The Project Delivery Team should note that this could result in a period of analysis shorter than 50 years. As periodic CERP updates are completed in accordance with section 385.31(c) of the programmatic regulations, the end-point for the period of analysis will be revised to reflect the new condition.

The Project Delivery Team should also recognize that a period of analysis shorter than 50 years might lead to higher average annual costs per unit of output. Such costs may require more justification to reviewing authorities.

2.3.4 Consideration of Existing Water Reservations

During the initial phase of plan formulation, the Project Delivery Team must identify if any existing reservations of water made under State law need to be considered. The Project Delivery Team must use the information related to the performance measures and associated targets from modeling for the existing reservations made by the SFWMD to aid in the identification of beneficial water made available for the natural system by the project.

2.3.5 Determining if Pre-CERP Baseline Water is Still Available

Section 385.35(b)(2) of the programmatic regulations requires that:

> "Each Project Implementation Report shall take into account the availability of Pre-CERP Baseline water and previously reserved water as well as the estimated total quantity of water that is necessary for restoration for the natural system and the quantity of water anticipated to be made available from future projects in identifying the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system, determining whether improvements in water quality are necessary to ensure that water delivered to the natural system meets applicable water quality standards; and identifying the amount of water for the natural system necessary to implement, under State law, the provisions of section 601(h)(4)(A)(iii)(V) of WRDA 2000."

The Pre-CERP Baseline is a description of assumed hydrologic conditions on the date of enactment of WRDA 2000 (December 11, 2000). The Project Delivery Team will compare the Existing Conditions PIR Baseline to the Pre-CERP Baseline to determine if there are changes in baseline water availability. The results of this comparison will be used in project formulation and evaluation. If the Pre-CERP Baseline water is no longer available for the natural system, then the Project Delivery Team may consider such things as:

- Developing alternatives that capture additional water; or
- Changes in system operations to increase the amount of water made available to the natural system.

More detailed information regarding the Pre-CERP Baseline is contained in Guidance Memorandum #3 and the Pre-CERP Baseline document.

2.3.6 Screen Alternative Plans for Existing Legal Sources and Levels of Service for Flood Protection

It is recommended that the Project Delivery Team perform a preliminary screening analysis for each alternative to determine potential effects on existing legal sources and levels of service for flood protection. The Project Delivery Team should identify a subset of evaluation criteria correlated to existing legal sources and flood protection considerations and for protection of fish and wildlife and the natural system. A detailed Savings Clause analysis for existing legal sources and flood protection will be done on the selected alternative plan.

Selection of screening criteria can be guided by information developed in comparing the Existing Conditions PIR Baseline to the Pre-CERP Baseline. In some areas or for some users, the Pre-CERP Baseline quantity of water will be exceeded in the Existing Conditions PIR Baseline. In other areas or for other users, the Pre-CERP Baseline quantity may no longer be available, or may be marginally exceeded; these areas can be identified for screening alternative plans during formulation of alternative plans. These types of indications are likewise true for flood protection.

2.3.7 Trade-Off Analysis

Trade-off analysis is the procedure to identify the potential gains and/or losses associated with producing a larger or lesser amount of a given output or outputs. The Project Delivery Team will identify and analyze potential trade-offs as part of the formulation and evaluation process. The results of trade-off analysis are to be displayed in the PIR.

2.3.8 Risk and Uncertainty Analysis

The Project Delivery Team will identify areas of risk and uncertainty in their analysis and describe them clearly, so that decisions can be made with the knowledge of the degree of reliability of the estimated benefits and costs and of the effectiveness of the selected alternative plan. When the costs and outputs of alternate plans are uncertain and/or there are risks that outcomes will not be achieved, the identification of a selected alternative plan becomes more complex. It is essential to document the assumptions made and uncertainties encountered during the course of planning analysis. Some activities may have relatively low risk while other activities may have higher risks. When identifying the selected alternative plan, the associated risk and uncertainty of achieving the proposed level of outputs must be considered. For uncertainties that may significantly affect project performance, the Project Delivery Team should conduct sensitivity analyses or scenario modeling. Adaptive management (see Guidance Memorandum #6) provides a means for addressing uncertainty in ecosystem responses.

2.4 PLAN FORMULATION AND EVALUATION

While the PIR has many aspects of a USACE Feasibility Study, the primary difference with the PIR is the steps taken to complete plan formulation and evaluation of the project. Unlike

a feasibility study, the PIR is based on a component or components that have previously been formulated to a certain level in developing the Plan and are expected to accomplish specific Plan goals. As such, formulation in the PIR always begins with the formulation already documented in the Plan.

During the development of the base conditions and models (See Guidance Memorandum #1) for the PIR, the Project Delivery Team should extract the relevant information from the Plan documents. In addition, the project described in the Plan should be reviewed and cost information updated based on available information. The Project Delivery Team should conduct an initial screening effort to determine if the project as described in the Plan will still achieve the benefits of the project as described in the Plan in a cost-effective manner. The results of this initial screening effort will be presented at the Feasibility Scoping Meeting (FSM) with Corps Headquarters (HQ) and the Office of the Assistant Secretary of the Army for Civil Works [OASA(CW)] to determine if the project plan formulation process will entail optimization of the project described in the Plan or if formulation of additional alternatives is necessary.

If the project as described in the Plan is reaffirmed, then the Project Delivery Team's efforts will focus on development of design alternatives and optimization of the project features, cost-effectiveness, satisfaction of programmatic regulations requirements for PIRs, Micro-Computer Aided Cost Engineering System (M-CACES) cost estimates, and the integrated NEPA documentation to supplement the information contained in the Programmatic Environmental Impact Statement for the Plan.

If formulation of additional alternatives is necessary, then the Project Delivery Team will formulate additional alternatives by developing management measures at different scales or sites to meet the project's goals and purposes.

When the project described in the Plan no longer achieves the benefits of the project as described in the Plan, additional formulation will be required prior to initiating detailed design of the selected plan. However, the formulation completed and described in the Plan will provide the foundation for the Project Delivery Team to formulate additional alternatives. The new or changed circumstances requiring additional formulation should be documented. As noted previously, for projects where the non-Federal sponsor has already acquired lands, formulation of alternative plans using other sites will be minimized if the intended project purposes can be achieved and no more cost-effective sites are identified during formulation. Additional management measures to address the new circumstances should be developed and screening should occur based on the project's evaluation criteria and performance measures. From the screening process additional alternatives will be formulated.

In both cases, either when a project is further optimized in a PIR or when additional formulation is needed, evaluations should be conducted on a system-wide basis in the context of the rest of the Plan using regional modeling tools such as the South Florida Water Management Model (SFWMM) when possible. Evaluation of system-wide effects of alternative plans conducted using regional models will be supported by RECOVER.

In some cases, a project is hydrologically separate from the C&SF Project or the regional model cannot capture its effects. In those cases, any necessary formulation and evaluation will utilize sub-regional or site-specific models that focus on more localized project outputs. Project performance measures will provide the link to describing system-wide benefits of the project.

2.4.1 Acceler8 Projects

The State has approved a SFWMD plan, called "Acceler8," for the SFWMD to design and construct a number of CERP projects. For each PIR that encompasses an Acceler8 project, the proposed Acceler8 project will be analyzed as one of the alternative plans considered or encompassed within the alternatives considered in the PIR. If the selected alternative plan includes the proposed Acceler8 project, then the Acceler8 project should be identified as Part I of the phased construction of the selected alternative plan.

2.4.2 Plan Formulation and Evaluation Procedure

The requirements for plan formulation and evaluation are described in the programmatic regulations:

> "The guidance memorandum shall describe the process for formulating and evaluating alternative plans for their ability to optimize contributions for achieving the goals and purposes of the Plan. The guidance memorandum shall describe the process for including each alternative plan with all of the other components of the Plan and evaluating the total monetary and non-monetary benefits and costs of the resulting comprehensive plan when compared to the without CERP condition. In formulating alternative plans to be evaluated, the project as described in the "Final Integrated Feasibility Report and Programmatic Environmental Impact Statement," dated April 1, 1999 shall be included as one of the alternative plans that is evaluated. For the selected plan, the guidance memorandum shall also describe the process for evaluating that plan as the next-added increment of the Plan.
>
> The guidance memorandum shall also include a process for identification of a selected alternative plan, based on the analyses conducted in paragraph (b)(2) of this section. The alternative plan to be selected should be the plan that maximizes net benefits, both monetary and non-monetary, on a system-wide basis, provided that this plan is justified on a next-added increment basis. Alternative plans that are not justified on a next-added increment basis shall not be selected. The guidance memorandum shall describe an iterative process for evaluating and/or combining alternative options until an alternative is identified that maximizes net benefits while still providing benefits that justify costs on a next-added increment basis."

The formulation and evaluation approach for CERP considers the system-wide interdependencies of CERP projects. The formulation and evaluation procedure includes four steps: 1) system formulation and evaluation; 2) cost-effectiveness and incremental cost analysis; 3) identification of the tentatively selected plan; and 4) next-added increment analysis. These steps are described in more detail in the following paragraphs.

2.4.2.1 Step 1: System Formulation and Evaluation

Once the level of formulation necessary for the PIR has been determined, the Project Delivery Team will initiate the formulation and evaluation process for the PIR. The Project Delivery Team will formulate and evaluate alternatives that maximize the achievement of the system-wide benefits of the Plan.

The Project Delivery Team is responsible for development of the set of alternative plans to be considered. For those projects where the formulation effort is to focus on optimization of the project described in the Plan, the Project Delivery Team will develop various configurations. For those projects where formulation of additional alternatives is necessary, the Project Delivery Team will consider different measures, components, features, and project scales within the study area to achieve the planning objectives and to achieve the benefits of the project described in the Plan. In accordance with the programmatic regulations, the initial alternative to be considered by the Project Delivery Team will be the project as defined in the Plan. While new information and implementation of other CERP components may show that this is an unrealistic alternative for consideration, evaluation of this alternative is required to demonstrate the differences between the approved Plan and the alternatives being considered. For each PIR that encompasses an Acceler8 project, the proposed Acceler8 project will be analyzed as one of the alternative plans considered or encompassed within the alternatives considered in the PIR.

Although the Project Delivery Team will be formulating and evaluating projects individually as part of the planning process, it is important that the tentatively selected plan maximize net system benefits. The Project Delivery Team, in coordination with RECOVER, should evaluate system-wide effects of alternatives. It will be these system-wide benefits that the Project Delivery Team will use as the basis for project justification.

In accordance with the programmatic regulations, the evaluation of alternatives involves the comparison of the future with condition to the Future Without CERP Baseline. For this purpose, the future with condition for an alternative plan will be built from the Future Without CERP Baseline and include all of the other projects of the Plan (authorized and not yet authorized) along with the alternative plan being evaluated. This will result in a system-wide "comprehensive plan" that be compared to the Future Without CERP Baseline.

Performance Measures and Project Benefits

Alternative plans will be evaluated and compared by calculating each alternative's outputs or benefits, both monetary and non-monetary, using appropriate National Ecosystem Restoration (NER) outputs. A complete discussion of NER evaluation may be found in

USACE guidance such as ER 1105-2-100. Benefits should be based on metrics that can be assessed as well as predicted, and that are consistent with RECOVER performance measures used in evaluation, assessment and development of interim goals and interim targets. Performance measures are a subset of the broader set of evaluation criteria that can be used to formulate and evaluate alternative plans. They are quantifiable measures of how well a project meets defined hydrological or ecological targets. Performance measures are used in both the planning phase and in post-construction monitoring and assessment of a project. They are used in plan formulation, alternative plan evaluation, and where appropriate, calculations of plan benefits. Performance measures are also used to monitor and assess project performance following construction. The interim goals and interim targets are a subset of the performance measures.

Because CERP projects are required to be selected and justified based on their system-wide benefits, the evaluation process should be based on the system-wide performance measures developed by RECOVER. The interim goals and interim targets should also be used in the evaluation process. In addition to system-wide performance measures, the Project Delivery Team may develop project-specific performance measures, if necessary, to capture localized alternative effects.

Performance measures should be linked to project goals and planning objectives and to the overall goals and purposes of CERP. A good set of performance measures will have the following attributes:

- Performance measures for the natural system should be based on the conceptual ecological models; performance measures for other water-related needs should be related to defined project objectives for other water-related needs;
- Cover the full range of potential effects of a plan on the project's planning objectives;
- Include no more measures than are necessary;
- Be supported by best-available scientific and technical information; and
- Be specific and sensitive enough to differentiate between alternative plans.

If project scale performance measures are developed, RECOVER will conduct a review of the project-level performance measures for consistency with the system-wide performance measures. The Project Delivery Team and RECOVER need to ensure that the targets are generally supported by the scientific literature or legal requirements.

Further, information from the U.S. Fish and Wildlife Service's Planning Aid Letters and Fish and Wildlife Coordination Act reports, the scientific literature, and scientific peer review will be used to assist in defining project benefits. Collaboration with appropriate agency partners will also be maintained in the process of developing such metrics.

Performance Measures for the Natural System

Performance measures for the natural system should be based on conceptual ecological models. The use of conceptual ecological models is a key element of the Applied Science

Strategy, as described in Guidance Memorandum #6, and a primary foundation for the development of CERP performance measures. Conceptual ecological models illustrate the links among societal actions, environmental stressors and ecological responses; they describe the major causal hypotheses that explain why the natural systems in south Florida have been altered; and they document the scientific rationale for the management actions undertaken to restore these systems (Gentile et al., 2001). Conceptual ecological models have guided the development of RECOVER's system-wide performance measures, the interim goals for the natural system, and the CERP Monitoring and Assessment Plan (MAP). The MAP provides documentation for the conceptual ecological models developed to date as well as additional information about their application in CERP (RECOVER, 2004).

In addition to the system-wide performance measures, additional ecological and hydrologic performance measures for the natural system may be developed and applied as needed. Ecological, biological, and water quality performance measures should be used along with the hydrologic measures when tools are available. To support project assessment and adaptive management, a single integrated set of performance measures with both predictive (evaluation) and assessment elements should be used for system-wide tasks including project alternative evaluation, assessments, and interim goals and interim targets.

Performance Measures for Urban and Agricultural Water Supply and Flood Protection

The CERP system-wide performance measures integrate multiple performance measures to evaluate the effects of projects on urban and agricultural water supply, flood protection, and resource protection. The Project Delivery Team should use these performance measures as appropriate or develop additional measures to gauge the effects of the project on the ability to supply water for urban and agricultural users or continue providing flood protection. If project performance measures are developed, they should be linked to State and Federal laws and policies (e.g. the State level of certainty planning goal for water supply is based on meeting needs in a 1 in 10 drought event).

2.4.2.2 Step 2. Cost-Effectiveness and Incremental Cost Analysis

The second step in the formulation and evaluation process is to evaluate cost-effectiveness and incremental cost analysis. A discussion of the metric that is used to conduct cost-effectiveness and incremental cost analysis (ICA) should be provided. This will include a summary of the ecological outputs and benefits as well as benefits to other water-related needs based on performance measures and a description of improvements to significant resources. A discussion of the system-wide benefits of the alternatives should be included. In some cases, the Project Delivery Team may not have tools available that adequately capture differences in outputs between alternative plans, particularly when considering design optimization alternative plans. In this case, the cost-effectiveness analysis is the critical analysis in selecting an alternative plan. Incremental cost analysis would not be necessary, or would be limited to demonstrating the efficiency (cost per unit of output) of each alternative plan. If available tools are able to capture differences in outputs between alternative plans, an incremental cost analysis should be conducted to determine which plans are "best buy" plans. The ICA demonstrates the increase in cost required for each additional unit of output. Only

cost-effective alternative plans that demonstrate viable benefits should be retained for further analysis.

2.4.2.3 Step 3: Identification of Tentatively Selected Plan

The third step of the formulation and evaluation process is the identification of the tentatively selected plan. This is done after consideration of the various alternative plans, their effects, public comments, and success in meeting Federal, State, and other requirements. In this final iteration of the planning process, the final array of alternatives is presented. This group will also include the no-action plan. These alternatives are representative of those alternatives that have made it through all previous iterations of formulation, screening, and evaluation. In addition, they have been assessed to comply with the Principles and Guidelines (complete, effective, efficient, and acceptable) as well as with NEPA requirements. Any of the alternatives in this final array provide a feasible option for implementation, meeting the intended goals and planning objectives of the PIR. Once a tentatively selected plan is identified, the next-added increment analysis (described in the next section) must be conducted.

2.4.2.4 Step 4: Next-Added Increment Analysis

The programmatic regulations require evaluation of the tentatively selected plan as the "next-added increment." The next-added increment analysis evaluates the effects, or outputs, of the tentatively selected plan as the next project to be added to the group of already approved CERP projects. This analysis helps illuminate the amount of benefits the selected alternative plan contributes without regard to future CERP projects. It also helps to ascertain whether sufficient benefits would accrue to the selected alternative plan to justify the cost, if no additional CERP projects (other than those already existing or authorized) were implemented.

The Project Delivery Team will conduct the next-added increment analysis on the tentatively selected plan and display the results so that the justification of the tentatively selected plan may be demonstrated. In accordance with the programmatic regulations, the next-added increment analysis will be conducted by adding the tentatively selected plan to the set of CERP projects that have been approved according to general provision of law or specific authorization of Congress and are likely to have been implemented by the time the selected alternative plan is completed (i.e. the Next-Added Increment Baseline). The addition of the tentatively selected plan will be compared to the Next-Added Increment Baseline to determine the justification of the tentatively selected plan on a next-added increment basis. The tentatively selected plan must be justified on a next-added increment basis. The Project Delivery Team should note that the Next-Added Increment Baseline, which only includes those CERP projects that have already been approved, is synonymous with the no-action alternative, which is different than the Future Without CERP Baseline.

The Project Delivery Team will estimate the percentage that the benefits that the tentatively selected plan will provide as the next-added increment compared to the total benefits to be provided by the tentatively selected plan. If the selected alternative plan cannot be justified

on a next-added increment basis, the Project Delivery Team should consider combining the selected alternative plan with other CERP components to identify an alternative that can be justified on a next-added increment basis or to consider delaying the implementation of the tentatively selected plan in order for the tentatively selected plan to be justified on a next-added increment basis.

SECTION 3: GUIDANCE MEMORANDUM #3
SAVINGS CLAUSE REQUIREMENTS

3.1 PURPOSE

This guidance memorandum provides guidance to Project Delivery Teams in their use of the Pre-CERP Baseline, which is described in another section and more fully described in the "Pre-CERP Baseline for the Comprehensive Everglades Restoration Plan" document, along with other tools and information in determining whether or not existing legal sources of water have been eliminated or transferred and whether levels of service for flood protection will be reduced under the Savings Clause of WRDA 2000.

While the programmatic regulations do not explicitly require guidance in using the Pre-CERP Baseline for flood protection analyses, guidance for Project Delivery Teams is needed and is provided in this guidance memorandum.

3.2 APPLICABILITY

This guidance memorandum applies to Project Implementation Reports (PIRs) for all CERP projects. Identifying if an elimination or transfer of existing legal sources of water will occur as a result of implementation of CERP and whether levels of service for flood protection will be reduced is required by section 601(h)(5) of WRDA 2000. These analyses will be conducted on the selected alternative plan. It is important for the Project Delivery Team to note that the analyses described in this guidance memorandum pertain specifically to the analyses required for compliance with the Savings Clause of WRDA 2000. In addition to the analyses conducted under the Savings Clause, the Project Delivery Team should conduct other appropriate analyses to determine if the selected alternative plan will affect other rights provided under Federal or State law (see Attachments 3-B, 3-C, and 3-F).

3.3 SAVINGS CLAUSE

For the components of CERP, the original purpose and intent is to create new sources of water by capturing water now lost to tide and to make more water available for the natural system and other water-related needs of the region. It is anticipated that if more water is made available for the natural system in South Florida through implementation of the Plan, more water should also be available for other existing and future uses. Under some circumstances, depending on the project components, the hydrologic changes inherent in the design of those components, and the sequence for implementation of CERP projects, existing legal sources of water may be partially or entirely eliminated or transferred to new sources as a result of project implementation. The Project Delivery Team must determine whether a project will cause an elimination or transfer of an existing legal source that was in existence on the date of enactment of WRDA 2000 (i.e. December 11, 2000). The specific requirement in WRDA 2000 is:

> "Until a new source of water supply of comparable quantity and quality as that available on the date of enactment of this Act is available to replace the water to be lost as a result of implementation of the Plan, the Secretary and the non-Federal sponsor shall not eliminate or transfer existing legal sources of water, including those for--
>
> (i) an agricultural or urban water supply;
> (ii) allocation or entitlement to the Seminole Indian Tribe of Florida under section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
> (iii) the Miccosukee Tribe of Indians of Florida;
> (iv) water supply for Everglades National Park; or
> (v) water supply for fish and wildlife."

In addition to the provision regarding elimination or transfer of existing legal sources, the Savings Clause requires that levels of service for flood protection that were legal and in existence as of the date of enactment of WRDA 2000 will not be reduced by the implementation of Plan projects. To help meet this statutory obligation, the programmatic regulations require that the operational conditions included in the Pre-CERP Baseline be considered in the appropriate analyses in each PIR. The specific requirement in WRDA 2000 is:

> "Implementation of the Plan shall not reduce levels of service for flood protection that are--
>
> (i) in existence on the date of enactment of this Act; and
> (ii) in accordance with applicable law."

Lastly, the Savings Clause has specific protections regarding the Seminole Tribe's compact:

> "Nothing in this section amends, alters, prevents, or otherwise abrogates rights of the Seminole Indian Tribe of Florida under the compact among the Seminole Tribe of Florida, the State, and the South Florida Water Management District, defining the scope and use of water rights of the Seminole Tribe of Florida, as codified by section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e)."

Projects are allowed to eliminate or transfer an existing legal source; however a replacement source that is a comparable source needs to be identified and be available prior to the elimination or transfer. Projects may not reduce levels of service for flood protection. Evaluation criteria for existing legal sources and for flood protection should not be used as performance measures to compare or rank alternative plans, to select a preferred alternative, or to measure project benefits. However, the Project Delivery Team should conduct preliminary screening analyses of alternative plans to determine potential effects on existing legal sources and levels of service for flood protection. These preliminary screening analyses should provide additional information that may affect which alternative plan is identified as the selected alternative plan.

3.4 DEFINITION OF EXISTING LEGAL SOURCE

The term "existing legal source" is unique to WRDA 2000 and is not defined in State or Federal law. The programmatic regulations require that a definition be developed in this guidance memorandum. Accordingly, the following definition for existing legal source is adopted for CERP:

> "Existing legal source means the quantity and quality of water available within a water basin (including seepage, surface water, direct rainfall, and groundwater) used for a water supply, including the quantity and quality necessary for protection of the source of supply, consistent with State and Federal law, as of December 11, 2000, for:
>
> 1. An agricultural or urban water supply;
> 2. Allocation or entitlement to the Seminole Indian Tribe of Florida under Section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
> 3. The Miccosukee Tribe of Indians of Florida;
> 4. Water supply for Everglades National Park; or
> 5. Water supply for fish and wildlife."

This guidance memorandum provides analytical procedures for evaluating existing legal sources as defined above.

3.5 RELATIONSHIP OF SAVINGS CLAUSE TO OTHER REQUIRED ANALYSES

The Savings Clause has a very specific purpose: to protect existing legal sources of water from elimination or transfer until a new source of comparable quantity and quality is available and to protect levels of service for flood protection, existing and in accordance with applicable law, from reduction by CERP projects. It is important for the Project Delivery Team to understand that just because implementation of the selected alternative plan would not cause a Savings Clause impact, there are other analyses that the team needs to conduct to evaluate whether there are impacts to the natural system or other water users. See Attachments 3-B, 3-C, and 3-F.

3.6 LEGAL ENTITLEMENTS

There are several existing legal entitlements that must be considered in the Savings Clause analysis. The following sections describe these entitlements and how those entitlements should be considered.

3.6.1 Seminole Tribe of Florida

The Seminole Tribe of Florida has a distinct set of water rights governed by Federal and State law and various Agreements. In 1987, the United States Congress passed the Seminole Indian Land Claims Settlement Act, P.L. 100-228, which incorporates the Water Rights Compact among the Seminole Tribe of Florida, the State of Florida and the South Florida Water Management District. The Florida Legislation enacted Chapter 87-292 and codified section 285.165, F.S., as the companion State legislation regarding the Water Rights Compact. The intent of the Compact, the Act, and the legislation was to create specifically defined water rights for the Tribe.

Section VI.A. of the Compact addresses agreements with landowners who may be affected by operations of the Tribe under a tribal Work Plan. This Work Plan must be submitted to the South Florida Water Management District for approval and amendment and is typically approved on an annual basis. Under Section VI.A., the Governing Board may approve private agreements between landowners, and if they are approved in that manner, the agreements will have the force and effect of the Compact as between the parties to the agreement. Section VI.B. addresses specific surface water entitlements for the Brighton Reservation, the Hollywood Reservation, and the Big Cypress Reservation.

The Compact describes an Evaluation Criteria Manual to further define and explain the conditions, criteria, and objectives of the Compact. The Compact also describes a Tribal Water Code to ensure compliance with the Compact.

In 1989, an Agreement was approved between the South Florida Water Management District and the Tribe on an Emergency Plan for Implementation of Technical Report on Water Availability Estimates for the Brighton Seminole Reservation – Water Shortage Conditions. The Agreement stated that when Lake Istokpoga can no longer release water, but while canals are still at or near optimum levels, the District will deliver the Tribe fifteen percent (15%) of the available water in the canals.

In 1992, under Section VI.A. of the Compact, an Agreement was signed between the South Florida Water Management District and the Seminole Tribe of Florida entitled "Providing for Water Quality, Water Supply and Flood Control Plans for the Big Cypress Seminole Indian Reservation and the Brighton Seminole Indian Reservation Implementing Section V.C. and VI.D. of the Water Rights Compact." This Agreement has the full force and effect of the 1987 Water Rights Compact. This 1992 Agreement provided for cooperation between the South Florida Water Management District and the Tribe to ensure that water quality criteria are addressed in the C-139 Basin and in waters entering the Big Cypress Seminole Indian Reservation. This 1992 Agreement also addresses the Tribe's Compact rights to surface waters for the Brighton Reservation.

The Compact, Evaluation Criteria Manual, Tribal Water Code, various Agreements and applicable Federal and State laws constitute the sources of regulation of consumptive water use, the management and storage of surface water and groundwater on Reservation and Tribal Trust lands.

As part of each PIR, the Project Delivery Team will use the following estimated Tribal Work Plan Allocation for the Brighton Reservation of 2,561.47 million gallons per maximum month to calculate the Tribe's existing legal source for the Brighton Reservation. Allocations for the Tribe's other reservations are captured in the Pre-CERP baseline.

3.6.2 Miccosukee Tribe of Indians of Florida

The Miccosukee Tribe of Indians of Florida has lived in the Everglades for generations and their culture and way of life is dependent on a healthy Everglades The Miccosukee Tribe is generally recognized to be successor to any existing rights of the Seminole Indians under the Everglades National Park Enabling Act, 16 U.S.C. 410 (b), which are not in conflict with the purposes for which the Everglades National Park (ENP) is created. On October 30, 1998, Congress clarified the rights of the Miccosukee Tribe, which became Federally recognized in 1962, to live and govern its own affairs in perpetuity in manners consistent with the MRAA for purposes of the administration, education, housing and cultural activities of the Tribe within a 666.6 acre Miccosukee Reserved Area (MRA) within the boundary of ENP. See Miccosukee Reserved Area Act, 16 U.S.C. 410 (MRAA). The MRAA also contains provisions to protect the ENP outside the boundaries of the MRA from adverse effects of structures or activities within that area, and to support restoration of the South Florida ecosystem, including restoration of the environment of the ENP. The Tribe's interests also include a 75,000-acre Federal Indian Reservation that is held in trust by the Federal government. The Tribe has established water quality standards under the Clean Water Act for the Federal Reservation. The Tribe also has a perpetual lease from the State of Florida to a Leased Area in Water Conservation Area 3 in accordance with The Florida Indian Land Claims Settlement Act. The Leased Area has for many years comprised part of Water Conservation Area 3 as part of the Federally authorized project of flood control and water management for central and southern Florida. The Tribe is subject to and shall not interfere with rights, duties and obligations of the SFWMD or the United States Army Corps of Engineers, pursuant to the requirements of the Central and South Florida Project pursuant to the requirements of the Federally authorized project, conveyances, easements, grants, rules, statutes, or any other present or future lawful authority to manage, regulate, raise or lower the water levels within the Leased Area in Water conservation Area 3. Additionally, the Tribe is permitted, under Public Law 93-440, to continue their usual and customary use and occupancy of Federal or Federally acquired lands and waters within the Big Cypress Preserve and the Addition Lands, including hunting and fishing on a subsistence basis, gathering of native plants, and conducting tribal ceremonies. In addition, there are Indian communities consisting of several Indian camps along Tamiami Trail.

3.6.3 Minimum Deliveries for Everglades National Park

In 1970, Congress passed the Minimum Deliveries Act, Public Law 91-282. The Act mandated that deliveries to ENP will not be less than 315,000 acre-feet annually or 16.5 per cent of the total deliveries from the C&SF Project System for all purposes, including ENP, whichever is less. The accompanying Senate Report divided this quantity of water between

Shark Slough, Taylor Slough, and the Eastern Panhandle of the Park, and provided monthly schedules for each of the delivery points.

In 1983, the Experimental Water Deliveries Program was authorized to develop a better hydrologic regime (PL 98-181). The 1983 Act authorized the USACE with the concurrence of the National Park Service and the SFWMD, to modify the schedule for delivery of water to ENP as required by the Minimum Deliveries Act for two years to conduct an experimental program of water deliveries from the C&SF Project to ENP. Then in 1991, PL 102-104 amended PL 98-181 to allow the Experimental Program to continue until the modifications to the C&SF Project authorized in the Everglades National Park Protection and Expansion Act of 1989 are completed and implemented.

It is important to note, however, that while the experimental program modified the minimum deliveries schedule, it had not been superseded or repealed by a subsequent Federal law on the date of enactment of WRDA 2000. For purposes of the Savings Clause, CERP projects will not eliminate or transfer water deliveries to Everglades National Park used as water supply as they were available on the date of enactment of WRDA 2000. However, for each PIR, the Project Delivery Team will follow the procedure set forth in Attachment 3-I to account for the amount of water delivered under the Minimum Deliveries Act to Everglades National Park.

3.7 THE PRE-CERP BASELINE

The Pre-CERP Baseline is a description of assumed hydrologic conditions on the date of enactment of WRDA 2000 (December 11, 2000), including a simulation of these conditions, which has been developed to satisfy the requirements of the programmatic regulations as a tool in the implementation of the Savings Clause (section 601(h)(5) of the Water Resources Development Act of 2000). The programmatic regulations define the Pre-CERP Baseline as:

> "…the hydrologic conditions in the South Florida ecosystem on the date of enactment of WRDA 2000, as modeled by using a multi-year period of record based on assumptions such as land use, population, water demand, water quality, and assumed operations of the Central and Southern Florida Project."

The Pre-CERP Baseline document (Department of the Army, in preparation) provides a description of the model assumptions necessary to simulate the pre-CERP hydrologic conditions. It also provides the results of a South Florida Water Management Model (SFWMM v5.4) simulation based on these assumptions.

3.7.1 Agricultural and Urban Water Supply

The existing legal sources for agricultural and urban water supplies in the Pre-CERP Baseline were determined using model assumptions based on the actual levels of consumptive use in existence as of the date of enactment of WRDA 2000. This methodology is consistent with the basic underlying principle used to choose assumptions for other

existing legal sources, which is to represent as closely as possible the actual conditions in place in the system as of the date of enactment of WRDA 2000 (December 11, 2000). The use of permitted allocations in existence as of the date of enactment of WRDA 2000 would have incorporated projected demands over the life of the permit that may or may not have been in existence at that date.

As a result, non-irrigation urban demands were calculated based on the actual pumpage and distribution in the year 2000. Urban irrigation and agricultural demands, including diversion and impoundment uses to supply these demands, were calculated based on the land use and crop acreage that existed as of 2000.

In addition, there are water deliveries made to the Lower East Coast in order to prevent salt water intrusion into water supply sources for urban and agricultural uses. Operations of the C&SF Project for these purposes are identified in the "Corps Water Control Plan for the Lower East Coast Canals" and are incorporated into the assumptions in the Pre-CERP Baseline.

3.7.2 Water Supply for Everglades National Park and for Fish and Wildlife

Water supply for Everglades National Park is primarily provided through regulatory and environmental releases through the S-12 structures and other operations of the C&SF Project. In December 2000, the C&SF Project in south Miami-Dade County was being operated according to the Interim Structural and Operational Plan (ISOP) in an attempt to meet the Reasonable and Prudent Alternative to avoid jeopardizing the Cape Sable Seaside Sparrow. This version of ISOP failed to meet the Reasonable and Prudent Alternative and was later replaced by the Interim Operational Plan (IOP), which is anticipated to remain in place until the Combined Structural and Operating Plan (CSOP) is implemented. For purposes of the Pre-CERP Baseline, the model assumptions for ISOP model run 9dr (also known as ISOP 2001), the operational regime actually in place on the date of enactment of WRDA 2000, are used in the Pre-CERP Baseline.

Due to the highly manipulated nature of south Florida's hydrology, much of the water on which fish and wildlife depend is affected, directly or indirectly, by deliveries made through the C&SF Project system for regulatory releases and other activities not explicitly intended to benefit fish and wildlife. Fish and wildlife habitat occurs in uplands, wetlands and estuaries throughout the region in vegetation communities that depend on appropriate sources of groundwater, surface water and flows to tide. The Savings Clause protection applies to sources available on the date of enactment of WRDA 2000 that were beneficial in supporting fish and wildlife including habitat.

3.8 INTERVENING NON-CERP ACTIVITIES

The Savings Clause only applies to changes from the date of enactment of WRDA 2000 that result from "implementation of the Plan." In some cases, the existing legal sources and the

level of service for flood protection that existed at that time may be altered or changed before a Plan project is implemented. These changes may result from actions by Federal, State, tribal, and local governments – actions that are wholly outside the Plan process. These "intervening" conditions, brought about by the implementation of non-CERP activities after the date of enactment of WRDA 2000, but before a CERP project component becomes operational, will change the hydrologic conditions from those reflected in the Pre-CERP Baseline. Examples include construction of government public works projects that impact the configuration of the C&SF Project system (e.g., Modified Water Delivery, C-111, C-51); construction of projects that impact the use of water from the C&SF Project system (e.g., stormwater treatment areas); changes to operations of the C&SF Project system (e.g., Interim Operational Plan, Combined Structural and Operating Plan) and the issuance of consumptive use permits under State law. When the Pre-CERP Baseline conditions have already been altered by this kind of intervening non-CERP activity, a different analysis is required for the purpose of applying the Savings Clause.

The programmatic regulations do not address intervening non-CERP activities. This guidance memorandum provides guidance to Project Delivery Teams in their analyses when dealing with such conditions. In general, the following principles will apply:

- The Savings Clause does not require CERP to make up for reductions in quantity and quality of existing legal sources or levels of service for flood protection caused by intervening non-CERP activities, but it does prohibit the Plan from further reductions.
- The Savings Clause does not prohibit CERP from reducing quantity and quality of existing legal sources or levels of service for flood protection that were increased by intervening non-CERP activities, but it does prohibit the Plan from reducing those increases below those in place at the date of enactment of WRDA 2000.

As an example, there have already been intervening non-CERP activities that have altered the hydrology affecting Everglades National Park (ENP). There have been operational changes since the Interim Structural Operating Plan, which is the operating schedule used in the Pre-CERP Baseline modeling. These operational changes, including the Interim Operating Plan (IOP), have had as their primary purpose avoiding jeopardy to the Cape Sable Seaside Sparrow until completion of construction of the Modified Water Deliveries Project and the 1994 C-111 GRR modifications and the implementation of the Combined Structural Operating Plan (CSOP), at which point in time these projects will become intervening non-CERP activities. The IOP is considered an intervening non-CERP activity. The future construction of the Modified Water Delivery Project and 1994 C-111 GRR features, together with the implementation of CSOP, will also be intervening non-CERP activities.

Additional examples and further guidance are provided in Attachments 3-A and 3-E. It is important for the Project Delivery Team to note that although the Savings Clause does not prohibit the Plan from reducing benefits increased by intervening non-CERP activities, other analyses may prohibit the Plan from reducing benefits increased by intervening non-CERP activities as discussed elsewhere; also see Attachment 3-B, 3-C, and 3-F.

3.9 MODEL SELECTION FOR SAVINGS CLAUSE ANALYSES

The Project Delivery Team should use its best professional judgment to determine the most appropriate model (see Attachment 1-A of Guidance Memorandum #1) to use for Savings Clause analyses considering the following general guidance:

- Modeling for the Saving Clause analyses of both existing legal sources and levels of service for flood protection should use the same assumptions and project operations.
- Evaluations should be done across a full range of hydrologic conditions, including wet, average, and dry years.
- The method used to quantify existing legal sources should be sensitive to conditions during which users of a source are most likely to be affected by changes in water quantity or quality.

The major regions of the South Florida ecosystem have been separated into water basins to determine existing legal sources. These water basins are shown as Figure 3-H-1 and listed in Table 3-H-1 in Attachment 3-H.

The model chosen for the evaluation should incorporate the full range of available meteorological conditions since the determination of elimination or transfer and levels of service for flood protection are based on the performance of the system as modeled against a range of weather conditions. However, it is recognized that the Project Delivery Team may determine that modeling with the full period of record is impractical and that, in their professional judgment, modeling a subset of the full period of record is an adequate substitute. If a subset of years is chosen it should be representative of the range of conditions in the historical period of record including intra- and inter-annual variations that are relevant to the protection of existing legal sources or levels of service for flood protection. The Project Delivery Team should document the selection of period of record used in the model.

As many CERP components are regional in scale, the Pre-CERP Baseline currently uses the South Florida Water Management Model (SFWMM) as the regional modeling tool for the area within the geographical limit of the model. Since regional models typically consist of large grid cells, only a general indication of flood protection can be determined through regional analysis. For that reason, smaller-scale integrated ground and surface water models may also be necessary for specific analysis of levels of service for flood protection and the Project Delivery Team should use such models when available. If regional modeling of a proposed alternative shows a negative direction in those evaluation criteria, it may be a trigger to do more site-specific modeling.

If the Project Delivery Team decides to use a smaller scale model, the model should use the same set of assumptions as the Pre-CERP Baseline with boundary conditions consistent with the regional model where applicable. Additionally, the Project Delivery Team must determine whether the effects of the project extend beyond the boundaries of the model. If it is determined that effects extend beyond the model boundaries, the Project Delivery Team must use a regional model or other tool to evaluate existing legal sources and levels of service for flood protection for those additional areas.

3.10 IDENTIFYING IF THERE IS AN ELIMINATION OR TRANSFER OF EXISTING LEGAL SOURCES

3.10.1 Identifying Existing Legal Sources to be Evaluated

The Project Delivery Team should identify all existing legal sources that could be affected by the project. The procedures in Attachment 1-A of Guidance Memorandum #1 should be used to determine the spatial extent of project effects. Once this geographical boundary is identified, the Project Delivery Team should identify all existing legal sources within the boundary. Several sources of information are available to assist the Project Delivery Team:

- Defined project purposes
- Information developed in the last completed PIR
- Maps of existing legal source basins within the regions affected by the project
- The Pre-CERP Baseline
- Spatial Data for Use in Identifying Existing Legal Sources of Water for Fish and Wildlife (U.S. Fish and Wildlife Service, In Preparation)

Some projects are intended to transfer users to different sources and clearly will require evaluation. Other cases of elimination or transfer of a source may be an incidental or unanticipated effect of a project. The analysis will need to address both types of elimination or transfer of sources.

Several basins within the South Florida ecosystem include existing legal sources for multiple user categories. For multiple user basins where an existing legal source is affected by the project, such effects must be evaluated separately for each of the user categories set forth in the definition of existing legal source.

Individual PIRs may also need to quantify water at a sub-basin level to evaluate local project effects on existing legal sources. Attachment 4-D of Guidance Memorandum #4 contains guidance on identification of natural and developed areas within the water basins.

3.10.2 Development of Evaluation Criteria

Evaluation criteria for the elimination or transfer analyses should be developed at the same time as other evaluation criteria and metrics to be used in project planning. Appropriate criteria should have the following properties:

- Include an appropriate scale for each measure;
- Be sensitive enough to detect effects during periods when impacts are most likely to occur;
- Be consistent with measures used in project evaluation; and
- For existing legal sources, metrics will express the volume of water provided to the source.

The measures used to evaluate existing legal sources are generally similar to those used to identify beneficial water for natural systems and water for other water-related needs.

3.10.3 Consider Project-level and System-wide Effects on All Existing Legal Sources of Water

Evaluation of existing legal sources should be conducted at both a system-wide level and at a local project-level, using available regional and sub-regional hydrologic and water quality models and other information. Projects that do not affect regional water deliveries are exempt from the system-wide evaluation; for these, project-level evaluation is sufficient. For both types of evaluations, the geographical evaluation area should be large enough to consider all potential effects on existing legal sources. Existing legal sources and levels of service for flood protection that are not affected should be identified and documented using an appropriate model in the PIR. Attachment 1-A of Guidance Memorandum #1 provides a procedure for determining whether a project has system-wide or project-level effects and for determining the spatial extent of project effects.

3.10.4 Identifying an Elimination or Transfer of Water

After the selected alternative plan is identified, the Initial Operating Regime will be developed. See section 4.5.4.1 of Guidance Memorandum #4 for a description of how the Initial Operating Regime will be developed.

The Initial Operating Regime will be compared to the Pre-CERP Baseline using the water basins in Attachment 3-H and any identified sub-basins to determine if the selected alternative plan will result in an elimination or transfer of existing legal sources. The Project Delivery Team will use changes in the volume of water as the basis for determining if implementation of the selected alternative plan will result in an elimination or transfer of existing legal sources. The primary available sources of water include local surface water storage, groundwater from the Biscayne Aquifer and other aquifers, surface water discharge and groundwater seepage from the Water Conservation Areas, and surface water from Lake Okeechobee.

If the comparison of the Initial Operating Regime with the Pre-CERP Baseline shows no reduction in volume from the Pre-CERP Baseline, then implementation of the selected alternative plan will not cause an elimination or transfer of existing legal sources, and the requirements of the Savings Clause have been met. If analysis of the Initial Operating Regime shows a reduction in volume from the Pre-CERP Baseline, then the Project Delivery Team must determine if the reduction is due to intervening non-CERP activities. In that case, the Initial Operating Regime will be compared to the Existing Conditions PIR Baseline to analyze if there is a reduction in volume caused by the selected alternative plan. If there is a reduction in volume between the Initial Operating Regime and the Existing Conditions PIR Baseline, the Project Delivery Team should not conclude that the reduction is due to implementation of the Plan. If required, additional analyses to determine whether an elimination or transfer is caused by the CERP project will be undertaken by inserting the demands and land use assumed in the Pre-CERP Baseline into the Initial Operating Regime

and the results compared. The Project Delivery Team may need to make additional model runs or conduct other analysis, on a case-by-case basis, to determine if implementation of the project is causing the change or if other non-CERP activities such as land use changes or future demands are causing the change. Additional guidance as to the effect of intervening non-CERP activities on determining if implementation of the selected alternative plan would result in an elimination or transfer is provided in Attachment 3-A.

Attachment 3-D provides a flow chart for the Project Delivery Team to follow in identifying eliminations or transfers of existing legal sources.

3.10.4.1 How Much of a Difference Between the Conditions Does it Take to Have an Elimination or Transfer?

It requires more than a simple volume change to have an elimination or transfer of existing legal sources under the Savings Clause. Volume differences between the Initial Operating Regime and the Pre-CERP Baseline should be significant. In the case of intervening non-CERP activities volume differences between the Initial Operating Regime and the Existing Conditions PIR Baseline should be significant. There are no specific criteria for determining if differences are significant; however the Project Delivery Team should consider all technical information, including performance measures in determining if the reduction in volume is significant, and thus an elimination or transfer of existing legal sources.

3.10.4.2 How to Determine if a Replacement Source is a Comparable Source?

Implementation of a CERP project cannot result in the elimination or transfer of an existing legal source of water unless that source will be replaced with a source of comparable quantity and quality as that available on the date of enactment of WRDA 2000.

If implementation of the selected alternative plan would cause an elimination or transfer of an existing legal source of water, then the PIR will include an implementation plan that ensures that such elimination or transfer will not occur until a source of comparable quantity and quality is available to replace the water to be lost as a result of implementation of the Plan.

If the Project Delivery Team determines that an elimination or transfer will occur, the team must then ensure that the replacement source is a comparable source in terms of water quality and quantity. The Project Delivery Team will make this determination utilizing specific technical information available to the team. The following determinations must be included in the evaluation of whether a replacement source is a comparable source:

1. Determine whether the yield of the proposed source is sufficient to meet the demands from the existing legal source assumed in the Pre-CERP Baseline to the extent that such demands were met during the various hydrologic conditions assumed in the Pre-CERP Baseline model run.

2. Determine whether the replacement source is sufficiently similar to that of the existing legal source in terms of its legal feasibility. In order to make this determination, the Project Delivery Team will need to identify that the necessary legal authorization to implement and use the sources of supply for the intended purpose can be obtained. This analysis includes a comparison of the feasibility of obtaining all required Federal, State, regional, and local authorizations, including State water quality standards, for the existing legal source to those necessary for the replacement source.

3. Determine whether the replacement source is sufficiently similar to that of the existing legal source in terms of its economic feasibility. To make this determination, the Project Delivery Team will need to obtain information about the costs associated with the use of the existing legal source to perform a comparison to the costs associated with use of the replacement source. This analysis includes a comparison of the costs of accessing, treating and using the existing legal source to the replacement source.

4. Determine whether the replacement source is sufficiently similar to that of the existing legal source in terms of its technical feasibility. To make this determination, the Project Delivery Team will need to obtain information, including cost information, on the infrastructure necessary to treat and use the existing legal source to compare with the infrastructure necessary to treat the replacement source.

3.10.4.3 What to Do if a Comparable Source Cannot Be Identified

The following are examples of actions that the Project Delivery Team may evaluate if analyses show that implementation of the selected alternative plan would result in an elimination or transfer of an existing legal source and a comparable replacement source cannot be identified:

- Modify the operations of the selected alternative plan to avoid an elimination or transfer.
- Redesign the selected alternative plan to avoid an elimination or transfer.
- Determine if there are other CERP projects scheduled concurrently with the subject project that will solve the elimination or transfer issue. If so, the elimination or transfer by the subject project is no longer an issue.
- Consider rescheduling the project concurrently with other components to avoid an elimination or transfer.
- If there is no other CERP project that can be scheduled concurrently with the subject project to solve the elimination or transfer issue, and a change in operations or design is not possible, it may be necessary to solve the elimination or transfer issue through consideration of other alternative plans or modifications to the Plan.

If the above actions are not feasible, then the Project Delivery Team will need to consider eliminating the project.

3.11 DETERMINING IF LEVELS OF SERVICE FOR FLOOD PROTECTION HAVE BEEN REDUCED

3.11.1 Levels of Service for Flood Protection to be Evaluated

WRDA 2000 did not limit levels of service for flood protection only to Federal law, but includes Federal and State law. State law includes levels of service for flood protection provided by subdivisions of the State, including water management districts, special taxing districts, and local governments. As such, in order to meet the second requirement, operational conditions associated with approved Federal, State, and local public works projects were included as assumptions in the Pre-CERP Baseline model run. These operational conditions incorporate regulation schedules for the natural system and the secondary and tertiary canal systems in South Florida to ensure that levels of service for flood protection are maintained both in the natural system and urban and agricultural areas. Generally, it should not be necessary to conduct Savings Clause analyses below this level. Depending upon site-specific conditions, it may be necessary to do more detailed analyses. The level of evaluation performed must be consistent for natural system and urban and agricultural areas.

The Project Delivery Team should identify all existing legal sources and areas within the study area where levels of service for flood protection could be affected by a project. The procedures in Attachment 1-A of Guidance Memorandum #1 should be used to determine the spatial extent of project effects. Once this geographical boundary is identified, the Project Delivery Team should identify all existing legal sources within the boundary. Several sources of information are available to assist the Project Delivery Team:

- Defined project purposes
- Information developed in the last completed PIR
- Maps of existing legal source basins within the regions affected by the project
- The Pre-CERP Baseline
- Spatial Data for Use in Identifying Existing Legal Sources of Water for Fish and Wildlife (U.S. Fish and Wildlife Service, In Preparation)

The Project Delivery Team must evaluate levels of service for flood protection in accordance with applicable law on a project-by-project basis.

3.11.2 Levels of Service for Flood Protection are Based on Performance Modeled Against a Range of Weather Conditions and Other Assumptions

The levels of service for flood protection are the performance of the system actually in place when modeled against a range of weather conditions and the other assumptions identified in the Pre-CERP Baseline. They are not statements of design purposes or planning goals. The history of the Governor's Commission for a Sustainable South Florida, the Restudy, and WRDA 2000 show that the intent was to protect existing legal flood protection benefits, but not necessarily to confer additional benefits.

The purpose of the Savings Clause is not to allow implementation of CERP projects to reduce levels of service for flood protection existing as of December 2000; levels of service vary from goals and design targets because of a number of factors, including changing land use. In the definition of "levels of service for flood protection" in the programmatic regulations, the term "expected performance" refers to the performance of the system actually in place when modeled against the period of record weather. It does not refer to specific design flood targets such as the 10-year or 100-year flood event, which may be considered in detail design.

3.11.3 Standard Project Flood and Other Design Flood Indicators Should Not Be Used for Levels of Service

Standard project flood and project design flood are not the same as Savings Clause "levels of service of flood protection…in existence on date of enactment." Standard project flood and similar terms are shorthand statements of design goals. They do not reflect the levels of service in existence in December 2000. There are several reasons for this:

- The project may not have been authorized as designed.
- Congress may not have funded the complete project as it was designed.
- Separate reaches of a project may have different levels of protection because of variance in the scope of project response to the flood threat.
- The level of protection may change over time because of new land uses or upstream development or because of other changed conditions, such as additional projects.
- Other projects may have been built which affected the original design level of flood protection; subsequent projects may have modified or superceded the original design plan.
- Operations of connected projects may have been changed and affected the feasibility of the originally projected level.
- Other circumstances may have affected the design level originally projected.

For example, there may be Endangered Species Act or other considerations that required a change in operations and made the originally projected level unfeasible. Finally, the Pre-CERP Baseline is defined by the programmatic regulations to mean the hydrological response of the system and operations in existence in December 2000 to weather in a specific period of record rather than to a design flood level.

3.11.4 Analyze the Selected Alternative Plan for Reductions in Levels of Service for Flood Protection

After the selected alternative plan is identified, the Initial Operating Regime will be developed. The Initial Operating Regime will be compared to the Pre-CERP Baseline to determine if the selected alternative plan will result in a reduction in levels of service for flood protection.

If the comparison of the Initial Operating Regime with the Pre-CERP Baseline shows no reduction in levels of service for flood protection from the Pre-CERP Baseline, then implementation of the selected alternative plan will not cause a reduction in levels of service for flood protection, and the requirements of the Savings Clause have been met. If analysis of the Initial Operating Regime shows a reduction in levels of service for flood protection from the Pre-CERP Baseline, then the Project Delivery Team must determine if the reduction is due to intervening non-CERP activities. In that case, the Initial Operating Regime will be compared to the Existing Conditions PIR Baseline to determine if there is a reduction in levels of service for flood protection caused by the selected alternative plan. If there is a reduction in levels of service for flood protection between the Initial Operating Regime and the Existing Conditions PIR Baseline, the Project Delivery Team should not conclude that the reduction is due to implementation of the Plan. If required, additional analyses to determine whether a reduction in levels of service for flood protection is caused by the CERP project will be undertaken by inserting the demands and land use assumed in the Pre-CERP Baseline into the Initial Operating Regime and the results compared. The Project Delivery Team may need to make additional model runs or conduct other analysis to determine if implementation of the project is causing the change or if other non-CERP activities such as land use changes or future demands are causing the change. Additional guidance as to the effect of intervening non-CERP activities on determining if implementation of the selected alternative plan would reduce levels of service for flood protection is provided in Attachment 3-E.

Attachment 3-F provides a list of other analyses of flood protection to be performed in addition to that required by the Savings Clause. Attachment 3-G provides a checklist for the levels of service for flood protection analysis for the selected alternative plan.

3.11.4.1 How Much of a Difference Between the Conditions Does it Take to Have a Reduction in Levels of Service for Flood Protection?

It requires more than a simple change in hydrological response to "reduce levels of service for flood protection" under the Savings Clause. Differences between the Initial Operating Regime and the Pre-CERP Baseline should be significant and adverse. In the case of intervening non-CERP activities differences between the Initial Operating Regime and the Existing Conditions PIR Baseline should be significant and adverse. There are no specific criteria for determining if differences are significant; however the Project Delivery Team should consider all technical information, including performance measures in determining if the reduction in levels of service for flood protection is significant and adverse, and thus prohibited.

Projects are not authorized with a certain level of protection, such as canal levels; they consist of structural or non-structural components that are operated in accordance with project purposes, usually multiple project purposes, including purposes other than flood control. The introductory statement to the programmatic regulations states, "We have concluded that the existing levels of service for flood protection for a particular area should be determined on a project-by-project basis."

Additionally, the same water levels may affect the same area differently during different seasons of the year. Similar water levels may affect paved areas differently than unpaved areas. The stage duration curves for a proposed alternative may show slight increases in water levels for brief periods during flood events, but a reduction in water levels for longer periods during flood events, resulting in an overall improvement in the level of service. Finally, water levels that have no impact in urban areas might have an important impact in an agricultural area and perhaps an even greater impact in critical habitat for an endangered species. The intent of the Savings Clause is to avoid harm to existing levels of service for flood protection, and not to avoid harmless differences in project operations.

3.11.4.2 What to do if a Selected Alternative Plan Reduces the Levels of Service for Flood Protection

No alternative plan can be selected if it fails the test for levels of service for flood protection. The Project Delivery Team should consider the following if analyses show that operation of the project would result in a reduction in the levels of service for flood protection. Any action taken should not change the purpose or benefits of the project.

- Modify the operations of the selected alternative plan to avoid a reduction in the levels of service.
- Redesign the selected alternative plan to avoid a reduction in the levels of service.
- To the extent consistent with Federal and State law, consider acquisition (fee or easement) of affected property if redesign of the selected alternative plan would not be cost-effective. Cost-effectiveness is required by the programmatic regulations, and the Project Delivery Team should carefully evaluate whether acquisition of a flowage or conservation easement is more cost-effective than fee acquisition.
- If a redesign or property acquisition is not justified and cost-effective for the project alone, consider whether combining the project with other components would be justified and cost-effective.
- Consider other alternative plans or modifications to the Plan.

If the above actions are not feasible, then the Project Delivery Team will need to consider eliminating the project.

ATTACHMENT 3-A
EFFECT OF INTERVENING NON-CERP ACTIVITIES ON EXISTING LEGAL SOURCES

As described in section 3.8, when the Pre-CERP Baseline conditions have already been altered by an intervening non-CERP activity, the Project Delivery Team applies a different analysis. In general, CERP will deal with intervening non-CERP activities as follows:

- The Savings Clause does not require CERP to make up for reductions in quantity and quality of existing legal sources or levels of service for flood protection caused by intervening non-CERP activities, but it does prohibit the Plan from further reductions.
- The Savings Clause does not prohibit CERP from reducing quantity and quality of existing legal sources or levels of service for flood protection that were increased by intervening non-CERP activities, but it does prohibit the Plan from reducing those increases below those in place at the date of enactment of WRDA 2000.

The Project Delivery Team must make a determination in the PIR as to this elimination or transfer by the intervening non-CERP activities. The following examples are provided as guidance to the Project Delivery Team for analyzing whether the project will eliminate or transfer quantities of existing legal source water in cases where the Pre-CERP Baseline hydrology has been altered by an intervening non-CERP activity:

Example (1):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity eliminates or transfers the water quantity or quality of an existing legal source that existed on the date of enactment. The proposed CERP project does not change the elimination or transfer caused by the intervening non-CERP activity.

Q. Is this an "elimination or transfer of an existing legal source" under the Savings Clause?

A. No. The existing legal source quantity or quality was eliminated or transferred by the non-CERP activity, not by implementation of CERP. The statute does not require the proposed CERP project to restore the quantity or quality that existed on date of enactment after that quantity or quality had been changed by an intervening project.

Example (2):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity eliminates or transfers the existing legal source quantity or quality that existed on the date of enactment. A proposed CERP project would increase the quantity or quality above that of the non-CERP activity, but it would not restore the existing legal source quantity or quality existing on date of enactment.

Q. Is this an "elimination or transfer" under the Savings Clause?

A. No. The elimination or transfer of quantity or quality was caused by the non-CERP activity, not by implementation of CERP. The statute does not require the Plan to restore the existing legal source quantity or quality that existed on date of enactment after it had been changed by an intervening non-CERP activity.

Example (3):

After date of enactment, a non-CERP activity is implemented. The non-CERP activity provides an improved quantity or quality of water than existed on the date of enactment. A proposed CERP project would eliminate or transfer the existing legal source quantity or quality below that provided by the non-CERP activity but still provide a higher existing legal source quantity or quality than on the date of enactment.

Q. Is this an "elimination or transfer" under the Savings Clause?

A. No. There is no elimination or transfer of an existing legal source quantity or quality from the date of enactment. The Savings Clause does not prohibit a reduction in the non-CERP improvement in existing legal source water quantity or quality provided by the intervening non-CERP activity because the increased quantity or quality wasn't in existence on the date of enactment. However, the Project Delivery Team should be aware that there might be other reasons why the proposed CERP project cannot reduce the increased water quantity or quality (see Attachments 3-B and 3-C).

Example (4):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity eliminates or transfers an existing legal source quantity or quality that existed on the date of enactment. A proposed CERP project would eliminate or transfer that existing legal source quantity or quality that existed on date of enactment even more than the non-CERP activity.

Q. Is the additional elimination or transfer of the existing legal source quantity or quality an "elimination or transfer" under the Savings Clause?

A. Yes. The initial elimination or transfer was not due to implementation of the CERP project; the Savings Clause does not require the proposed CERP project to restore that existing legal source quantity or quality. However, the additional elimination or transfer was due to implementation of the Plan. The intent of the Savings Clause prohibits the proposed CERP project from eliminating or transferring the existing legal source quantity or quality more than it had been already eliminated or transferred by the non-CERP activity.

Example (5):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity provides a greater quantity or quality than existed on the date of enactment. A proposed CERP project would eliminate the increased quantity or quality

provided by the non-CERP activity, but would not reduce the benefit from that which existed on the date of enactment.

Q. Is this an "elimination or transfer" under the Savings Clause?

A. No. The Savings Clause prohibits the implementation of CERP from eliminating or transferring the existing legal source quantity or quality existing on the date of enactment. The Savings Clause does not prohibit elimination or transfer of the non-CERP activity increased quantity or quality because it was not in existence on the date of enactment. The proposed CERP project is not required to restore the increased quantity or quality provided by the non-CERP activity. However, the Project Delivery Team should be aware that there might be other reasons why the proposed CERP project cannot reduce the increased water quantity or quality (see Attachments 3-B and 3-C).

Example (6):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity provides an increased water quantity or quality than existed on the date of enactment. A proposed CERP project not only would eliminate and transfer the greater water quantity or quality provided by the non-CERP activity, but also would eliminate or transfer the existing legal source water quantity or quality existing on the date of enactment.

Q. Is this an "elimination or transfer" under the Savings Clause?

A. Yes. The elimination or transfer of the existing legal source quantity or quality in existence on date of enactment is due solely to implementation of the CERP project. The Savings Clause prohibits implementation of the Plan from eliminating a legal source quantity or quality in existence on date of enactment. The Savings Clause does not prohibit an elimination or transfer of the non-CERP quantity or quality because it was not in existence on the date of enactment. The proposed CERP project is not required to restore the quantity or quality provided by the non-CERP activity. However, the Project Delivery Team should be aware that there might be other reasons why the proposed CERP project cannot reduce the increased water quantity or quality (see Attachments 3-B and 3-C).

Note: It is important for the Project Delivery Team to note that the Savings Clause analyses described in Guidance Memorandum #3 pertain specifically to the analyses required for compliance with the Savings Clause of WRDA 2000. The Project Delivery Team should conduct other appropriate analyses to determine if the selected alternative plan will affect other rights provided under Federal or State law.

ATTACHMENT 3-B
OTHER ANALYSES AND PROTECTIONS FOR THE NATURAL SYSTEM

The protection provided by the Savings Clause in WRDA 2000 is limited to protecting sources of water identified as of the date of enactment of WRDA 2000, such as those for the natural system, from elimination or transfer by CERP projects. Projects that will provide beneficial water for the natural system – Modified Water Deliveries to Everglades National Park and the 1994 C-111 GRR modifications to the to the C&SF Project – were not included in the assumptions for quantifying the natural system's existing legal sources because the Combined Structural and Operating Plan (CSOP) process, which will determine the operations of these features, was not completed as of the date of enactment of WRDA 2000. For the purpose of the Savings Clause evaluation, these projects are considered intervening non-CERP activities.

The purpose of this attachment is to make the Project Delivery Team aware that there are other analyses which provide protection for the increased beneficial flows from the Modified Water Deliveries to Everglades National Park and the 1994 C-111 GRR modifications to the to the C&SF Project as part of the PIR process. Both of these projects were included in the Future Without CERP Baseline. PIRs will evaluate the benefits from these projects in the following ways:

- Evaluation and protection of non-CERP activity benefits by WRDA 2000 Section 601(f): WRDA 2000 Section 601(f)(2) requires that the proposed activity be justified by the environmental benefits derived by the South Florida ecosystem. This will require consistency of the project with the benefits provided by existing non-CERP activities and the Future Without CERP Baseline identified in the Plan.

- Evaluation and protection of non-CERP activity benefits by "optimizing" process in the programmatic regulations: The programmatic regulations (33 CFR 385.26(b)) require that, in preparing a PIR, the USACE and the non-Federal sponsor follow a formulation and evaluation process for alternative plans. The regulations provide that this process will optimize the project's contributions towards achieving the benefits of the Plan. Achieving the benefits of the Plan assumes that the benefits provided by non-CERP activities, like the Modified Water Deliveries, C-111, and the Everglades Construction projects, and other elements of the Future Without CERP Baseline described in the Plan are necessary to achieve the benefits of the Plan.

- Evaluation and protection of non-CERP activity benefits by NEPA analysis: The environmental effects of proposed CERP projects will be evaluated under NEPA. NEPA requires a comparison of a range of alternative plans with conditions that will exist if no action is taken.

- Evaluation and protection of non-CERP activity benefits by the Fish and Wildlife Coordination Act, the Endangered Species Act, the Coastal Zone Management Act, and

other Federal laws: The environmental effects of Plan proposed CERP projects on fish and wildlife resources available at the time of the PIR will be evaluated under the Fish and Wildlife Coordination Act, the Endangered Species Act, the Coastal Zone Management Act, and other Federal laws. This evaluation will consider any loss of benefits to fish and wildlife, any impacts on endangered or threatened species, and any impacts on resources of Florida's coastal zone, including benefits provided by non-CERP activities, even though they did not exist on date of enactment.

- Evaluation and protection of non-CERP activities benefits by Florida law: The environmental effects of proposed CERP projects will be evaluated under applicable Florida laws, including minimum flows and levels, and Florida Statute Section 373.1501. For example, the Modified Water Delivery Project to Everglades National Park and the 1994 GRR modifications to the C-111 Canal projects both were included in the Future Without CERP Baseline and were assumed by Congress to be constructed & operational before related Plan projects become operational. They are part of the framework Plan, as well as the benefits provided by Florida's Everglades Construction Project, and the water treatment requirements of the 1994 Everglades Forever Act.

ATTACHMENT 3-C
OTHER ANALYSES AND PROTECTIONS FOR OTHER WATER-RELATED NEEDS

The protection provided by the Savings Clause in WRDA 2000 is limited to protecting existing legal sources of water identified as of the date of enactment of WRDA 2000 for the specified user classifications. In addition, the primary State authority regarding the implementation of CERP is Chapter 373, F.S., provides assurances that implementation of CERP will not have adverse affects. These provisions provide responsibility to the State, including the SFWMD and the Florida Department of Environmental Protection, to ensure restoration of the Everglades and the protection of existing legal uses of water and existing levels of flood protection when designing and implementing CERP project components.

Assurances are provided under State law requiring that CERP be used as a "guide and framework ... to:… 2. ensure that the project components will be implemented to achieve the purposes of the Federal Water Resources Development Act of 1996 that include restoring, preserving and protecting the South Florida ecosystem, …and providing such features as are necessary to meet the other water-related needs of the region, including flood control, the enhancement of water supplies, and other objectives served by the project" (section 373.470(3)(b)2., F.S).

Section 373.1501(2), F.S., in part, provides that CERP components must be implemented through appropriate processes under Chapter 373 and consistent with the balanced policies and purposes of Chapter 373, F.S. Specifically, Section 373.1501(5) provides assurances to natural systems, existing legal users and for flood protection, including requirements that SFWMD for each project component:

a. Analyze and evaluate all needs to be met in a comprehensive manner and consider all applicable water resource issues, including water supply, water quality, flood protection, threatened and endangered species, and other natural system and habitat needs.

b. Consistent with [Chapter 373], the purposes for the Restudy provided in the Water Resources Development Act of 1996, and other applicable Federal law, provide reasonable assurances that the quantity of water available to existing legal users shall not be diminished by implementation of project components so as to adversely impact existing legal users, that existing levels of service for flood protection will not be diminished outside the geographic area of the project component, and that water management practices will continue to adapt to meet the needs of the restored natural environment.

Prior to executing a Project Cooperation Agreement, the SFWMD must develop a Project Implementation Report with the U.S. Army Corps of Engineers to address the requirements in Section 373.1501, F.S., and to obtain approval under Section 373.026, F.S., from the DEP.

This ensures that the PIR will be sufficient to meet both State, as well as Federal, law requirements for implementing a CERP project.

Definition of Existing Legal Uses Pursuant to Chapter 373, F.S.

As explained above, State law protects existing legal uses of water when implementing CERP. Permitted consumptive uses and domestic water uses (which are exempt from requirements to obtain a permit) have the legal status of an "existing legal use." The existing legal use is defined by the consumptive use permit authorizing the use of a specified source to meet an identified reasonable-beneficial demand for water for a limited duration. They receive the permits pursuant to the statutes and rules set forth in Part II of Chapter 373, F.S. The existing legal use is conditioned to ensure that the consumptive use activities under the permit continue to be conducted in accordance with Chapter 373, F.S. Existing presently existing legal uses under a consumptive use permit are protected so long as they are "not contrary to the public interest." Unauthorized, including, unpermitted, consumptive uses do not constitute an "existing legal use" and are not protected by the statute.

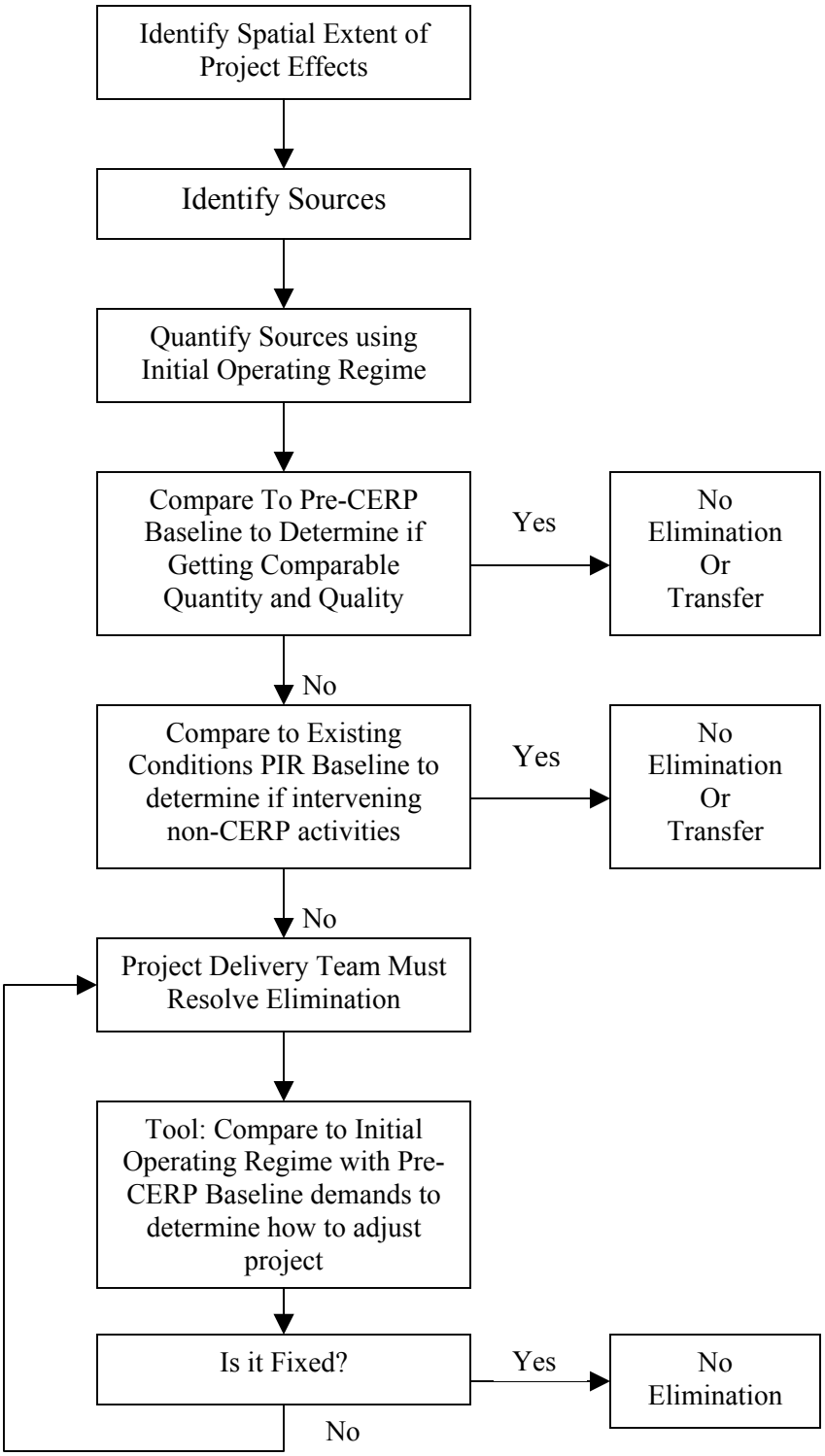
Other Chapter 373 Tools for Protecting Existing Legal Uses of Water

Chapter 373, F.S., addresses the protection of existing legal uses in several places. Section 373.171, F.S., provides that no rule or order of the water management district shall require modification of an exiting legal use unless such use is detrimental to other water users or to the water resources of the state. In addition, there are limited grounds upon which revocation of consumptive use permits can occur, as set forth in Section 373.243, F.S., including willful violation of permit conditions and submission of false material information required under law.

Existing legal uses of water are also protected when adopting water reservations pursuant to Section 373.223(4), F.S. Specifically, existing legal uses are protected so long as they are "not contrary to the public interest." This public interest balancing is conducted by the Governing Board of the water management district when establishing a reservation. For CERP project reservations, Section 373.1501 provides additional direction for protection of existing legal uses.

Furthermore, existing legal use rights are considered when implementing water shortage declarations under Section 373.246, F.S. Specifically, under this section, water supplies are to be equitably distributed during droughts so as to protect water resources from serious harm and to reasonably meet the continued demands of the permitted users. This is commonly referred to as the "shared adversity" standard, in which both existing legal uses and water resources share in the adversity that occurs during water shortages. These provisions are implemented through water management district rules, including the SFWMD water shortage plan set forth in Chapter 40E-21, F.A.C.

ATTACHMENT 3-D
FLOW CHART FOR ELIMINATION OR TRANSFER TEST AND INTERVENING NON-CERP ACTIVITIES



ATTACHMENT 3-E
EFFECT OF INTERVENING NON-CERP ACTIVITIES ON REDUCTION IN LEVELS OF SERVICE FOR FLOOD PROTECTION

The Savings Clause applies to reduction in levels of service for flood protection only caused by "implementation of the Plan." The Project Delivery Team should not assume that differences between the Initial Operating Regime and the Pre-CERP Baseline are due to implementation of the Plan. The Project Delivery Team must use some appropriate method to identify any reduction in levels of service caused by implementation of non-CERP activities since December 2000.

After the Project Delivery Team has determined the reduction in levels of service caused by the intervening non-CERP activity, the Project Delivery Team must then determine if the CERP project will further reduce the levels of service from that reduction caused by the intervening non-CERP activity. If the CERP project will significantly impact levels of service beyond those caused by the non-CERP activity, guidance is provided in Attachment 3-G as to next steps for the Project Delivery Team.

The following examples for the effect of intervening non-CERP activities on the Savings Clause analysis for levels of service for flood protection are provided:

Example (1):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity reduces the level of service that existed on the date of enactment. The proposed CERP project does not change the level of service provided by the intervening non-CERP activity.

Q. Is this a "reduction in levels of service for flood protection" under the Savings Clause?

A. No. The level of service was reduced by the non-CERP activity, not by implementation of CERP. The statute does not require the proposed CERP project to restore the level of service that existed on date of enactment after that level of service had been changed by an intervening project.

Example (2):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity reduces the level of service that existed on the date of enactment. A proposed CERP project would increase the level of service above that of the non-CERP activity, but it would not restore the levels of service existing on date of enactment.

Q. Is this a "reduction in levels of service for flood protection" under the Savings Clause?

A. No. The level of service was reduced by the non-CERP activity, not by implementation of the Plan. The statute does not require the Plan to restore the level of service that existed on date of enactment after it had been changed by an intervening non-CERP activity.

Example (3):

After date of enactment of WRDA 2000, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity provides a greater level of service than existed on the date of enactment. A proposed CERP project would reduce the level of service below the non-CERP activity but still provide a higher level of service than on the date of enactment.

Q. Is this a "reduction in levels of service for flood protection" under the Savings Clause?

A. No. There is no reduction in level of service from the date of enactment. The Savings Clause does not prohibit a reduction in the non-CERP level of service because it wasn't in existence on the date of enactment.

Example (4):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity reduces the level of service that existed on the date of enactment. A proposed CERP project would further reduce the level of service that existed on date of enactment even more than the non-CERP activity.

Q. Is the additional reduction in the level of service a "reduction in levels of service for flood protection" under the Savings Clause?

A. Yes. The initial reduction in level of service was not due to implementation of the Plan; the Savings Clause does not require the proposed CERP project to restore that level of service. However, the additional reduction in level of service was due to implementation of the CERP project. The intent of the Savings Clause prohibits the proposed CERP project from reducing the level of service more than it had been reduced by the non-CERP activity.

Example (5):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity provides a greater level of service than existed on the date of enactment. A proposed CERP project would eliminate the increased level of service provided by the non-CERP activity, but would not reduce the level of service from that which existed on the date of enactment.

Q. Is this a "reduction in levels of service for flood protection" under the Savings Clause?

A. No. The Savings Clause prohibits the implementation of CERP from reducing the level of service existing on the date of enactment. The Savings Clause does not prohibit a reduction

in the non-CERP level of service because it was not in existence on the date of enactment. The proposed CERP project is not required to restore the level of service provided by the non-CERP activity.

Example (6):

After date of enactment, a non-CERP activity is implemented in accordance with applicable law. The non-CERP activity provides a greater level of service than existed on the date of enactment. A proposed CERP project not only would eliminate the greater level of service provided by the non-CERP activity, but also would reduce the level of service existing on date of enactment.

Q. Is this a "reduction in levels of service for flood protection" under the Savings Clause?

A. Yes. The reduction in the level of service in existence on date of enactment is due solely to implementation of the CERP project. The Savings Clause prohibits implementation of the Plan from reducing the level of service in existence on date of enactment. The Savings Clause does not prohibit a reduction in the non-CERP level of service because it was not in existence on the date of enactment. The proposed CERP project is not required to restore the level of service provided by the non-CERP activity.

Note: It is important for the Project Delivery Team to note that the Savings Clause analyses described in Guidance Memorandum #3 pertain specifically to the analyses required for compliance with the Savings Clause of WRDA 2000. The Project Delivery Team should conduct other appropriate analyses to determine if the selected alternative plan will affect other rights provided under Federal or State law.

ATTACHMENT 3-F
OTHER ANALYSES OF FLOOD PROTECTION TO BE CONDUCTED IN ADDITION TO THE SAVINGS CLAUSE

Analysis of flood protection under the Savings Clause compares the proposed CERP project with conditions existing at a specific point in time, the date of enactment of WRDA 2000. The Savings Clause analysis is separate from, and different than, each of the following. All of these analyses may require additional analysis of flood protection in the PIR:

- NEPA analysis of impact of alternative plans on the Next-Added Increment Baseline. This analysis compares the impact of the proposed CERP project to conditions existing at a different point in time than the Savings Clause. Under NEPA alternative plans are compared to the no-action alternative.

- Takings analysis. This compares the impact of the proposed component to constitutional property rights, which may or may not be related to levels of service for flood protection at the time of enactment of WRDA 2000.

- Programmatic regulations, 33 CFR section 385.15, requires that "Project Implementation Reports will include such information and analyses, consistent with this part, as are necessary to facilitate review and approval of projects by the South Florida Water Management District and the State pursuant to the requirements of Florida law." The State requirements are different in several ways from the Federal law. The current Florida law (Florida Statute 373.1501(d)) requires the non-Federal sponsor to consider whether there is adverse impact of the proposed CERP project on users and uses existing at the current time, including providing "reasonable assurances" that "the existing levels of service for flood protection will not be diminished outside the geographic area of the Plan project component." Furthermore, State law defines changes in the project component as changes in the C&SF Project as it existed and was operated as of Jan. 1, 1999 (FS 373.1501(1)(g)), rather than changes made by the Plan from December 11, 2000 as WRDA 2000 Section 601 does.

- Consideration of additional flood protection under 33 CFR Section 385.37(c). This section of the programmatic regulations provides that "As appropriate, the USACE and the non-Federal sponsor shall consider opportunities to provide additional flood protection, consistent with restoration of the natural system, and the provisions of Section 601(f)(2)(B) of WRDA 2000 and other applicable laws." This comparison is different than, and in addition to, the Savings Clause analysis.

ATTACHMENT 3-G
CHECKLIST FOR LEVELS OF SERVICE FOR FLOOD PROTECTION

Step (1). Was there a Water Management District, Chapter 298 District, county or municipal flood protection project or stormwater management system constructed and operating in the proposed CERP project area on the date of enactment of WRDA 2000 (i.e. December 11, 2000)?

If the answer is "no," stop. Go to step (2).

If "yes," determine all the facts and circumstances, and determine if this qualifies as a level of service for flood protection "in accordance with applicable law" under the guidance in this memo. Then go to steps (2) and (3)

Step (2). On the date of enactment of WRDA 2000, was there a Federal or State flood protection project in the area affected by the proposed CERP project component?

If there was no Federal, State or local level of service for flood protection, stop. There is no "level of service for flood protection" issue. Go to step (12).

If "yes," go to step (3).

Step (3). Determine the actual stage-frequency curve(s) for the flood protection or stormwater management project as it was constructed and operating on the date of enactment of WRDA 2000. As required by the programmatic regulations, consider the operational conditions included in the Pre-CERP Baseline, and other appropriate analysis, in determining the actual stage-frequency curve. Go to step (4).

Step (4). Determine the stage-frequency curve(s) for the "with CERP project" alternative being considered. Go to step (5).

Step (5). Is there a difference between (3) and (4)?

If "no," stop. Go to step (11)

If "yes," go to step (6).

Step (6). Is the difference both significant and adverse to current land uses in the proposed CERP project component area?

If "no," stop. Go to step (11).

If "yes," go to step (7).

Step (7). Is the difference both significant and adverse to land uses that were in existence in the proposed CERP project component area on the date of enactment of WRDA 2000?

If "no," stop. Go to step (11).

If "yes," go to step (8).

Step (8). Are significant and adverse changes in the levels of service for flood protection due to changes in land use or to implementation of a non-CERP activity?

If there are no significant and adverse changes caused solely by the proposed CERP project component, stop. Go to step (11)

If there are significant and adverse differences caused by the proposed CERP project component, go to step (9).

Step(9). (a) Can the proposed alternative be changed to avoid either significant or adverse effects, or (b) can a mitigation feature (e.g. pumps, retention areas, and levees) be added to prevent either significant or adverse effects on the "levels of service for flood protection"?

If you determined the answer to either (a) or (b) as "yes," determine if the proposed alternative is still justified and cost-effective. CERP and the programmatic regulations require projects to be justified and cost-effective (WRDA 2000 Section 601(f)(2)).

If the redesigned alternative is still justified and cost-effective, stop. Change or mitigate the proposed alternative for the CERP component accordingly. Then go to step (11).

If the redesigned alternative is not justified and/or cost-effective, then go to step (10).

If both (a) and (b) answers are "no," stop. Eliminate this alternative.

Step (10). If redesign would not be cost-effective, consider acquisition of affected property.

If affected property cannot be acquired or if the alternative would no longer be justified or cost-effective if property were acquired, stop. Eliminate this alternative.

If the alternative is still justified or cost-effective, go to step (11)

Step (11). Determine if smaller scale modeling must be done to determine flood impacts on a site-specific basis.

Regional models such as the South Florida Water Management Model (SFWMM) may be used for the initial screening. Many CERP components are regional in scale. The Project Delivery Team may use their best professional judgment to determine

when smaller scale site-specific modeling is needed to determine whether there is a reduction in "levels of service for flood protection." Smaller sub-regional projects may be a likely candidate for smaller scale modeling.

RECOVER is developing performance measures for flooding in urban and natural system areas. If regional modeling of a proposed alternative shows a negative direction in those performance measures, that's an indication that more site specific modeling is needed.

If you determine that no further modeling is necessary, stop. There is no level of service for flood protection issue. Go to step (12).

If you determine that modeling on a smaller scale\more site-specific basis must be done in addition to the regional modeling, repeat steps (3)-(10), then go to step (12).

Step (12). Level of service for flood protection analysis complete.

ATTACHMENT 3-H
WATER BASINS

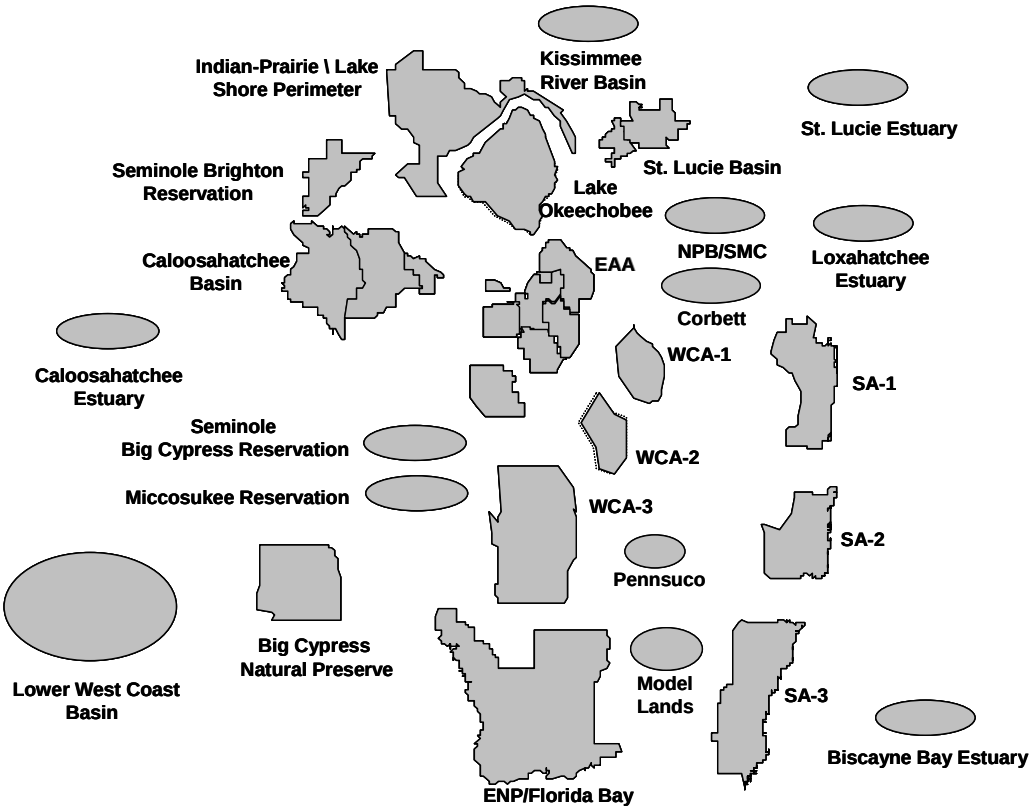


Figure 3-H-1: Water Basins

Legend
NPB – North Palm Beach
SMC – Southern Martin County
SA-1 – Service Area 1
SA-2 – Service Area 2
SA-3 – Service Area 3
WCA-1 – Water Conservation Area 1
WCA-2 – Water Conservation Area 2
WCA-3 – Water Conservation Area 3

Table 3-H-1: List of Water Basins

Water Basin
Kissimmee River Basin
Indian Prairie/Lake Shore Perimeter
St. Lucie Basin
St. Lucie Estuary
Lake Okeechobee
Seminole Brighton Reservation
Caloosahatchee Basin
Caloosahatchee Estuary
North Palm Beach and Southern Martin County (NPB/SMC)
Corbett
Loxahatchee Estuary
Everglades Agricultural Area (EAA)
Rotenberger/Holey Land
Seminole Big Cypress Reservation
Miccosukee Reservation
Big Cypress Natural Preserve
Lower West Coast Basin
Lower East Coast Service Area 1 (SA-1)
Lower East Coast Service Area 2 (SA-2)
Lower East Coast Service Area 3 (SA-3)
Water Conservation Area 1 (WCA 1)
Water Conservation Area 2 (WCA 2)
Water Conservation Area 3 (WCA 3)
Pennsuco Wetlands
Model Lands
Biscayne Bay Estuary
Everglades National Park and Florida Bay (ENP/Florida Bay)

ATTACHMENT 3-I
PROCEDURE FOR MINIMUM DELIVERIES TO EVERGLADES NATIONAL PARK WATER ACCOUNTING

The 1970 Minimum Deliveries to Everglades National Park Act "requires that the project deliver to the park annually not less than 315,000 acre-feet, or 16.5 percent of total water deliveries from the project, whichever is less." Monthly minimum deliveries to three parts of the park totaling the 315,000 acre-feet were specified.

For purposes of the Savings Clause, CERP projects will not eliminate or transfer water deliveries to Everglades National Park used as water supply as they were available on the date of enactment of WRDA 2000. However, in order to account for the deliveries to Everglades National Park in accordance with the Minimum Deliveries Act, the Project Delivery Team will undertake the following accounting procedure as part of each PIR:

> For each month, the sum of deliveries through the S-12 (A-D) structures, to Taylor Slough, and to the Eastern Panhandle should not be less than the quantities shown in Table 3-I-1.

Table 3-I-1: Minimum Monthly Deliveries to Everglades National Park

Month	Quantity (Acre-Feet)		
	S-12 (A-D)	Taylor Slough	Eastern Panhandle
January	22,000	740	1,540
February	9,000	370	630
March	4,000	185	290
April	1,700	185	110
May	1,700	370	110
June	5,000	6,600	340
July	7,400	7,400	510
August	12,200	2,960	860
September	39,000	5,920	2,690
October	67,000	7,770	4,630
November	59,000	3,700	4,060
December	32,000	740	2,230
TOTAL	260,000	37,000	18,000

SECTION 4: GUIDANCE MEMORANDUM #4 IDENTIFYING WATER NEEDED TO ACHIEVE THE BENEFITS OF THE PLAN

4.1 PURPOSE

This guidance memorandum provides instructions to Project Delivery Teams on how to identify the appropriate quantity, quality, timing and distribution of water for the natural system and for other water-related needs that is needed to achieve the benefits of the Plan. Section 385.35(b)(3) of the programmatic regulations requires that this guidance memorandum provide a process to be used in the preparation of PIRs for:

1. Identifying the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;
2. Determining the quantity, timing, and distribution of water made available for other water-related needs of the region;
3. Determining whether improvements in water quality are necessary to ensure that water delivered by the Plan meets applicable water quality standards; and
4. Identifying the amount of water for the natural system necessary to implement, under State law, the provisions of Section 601(h)(4)(A)(iii)(v) of WRDA 2000.

It is important for Project Delivery Teams to note that this guidance memorandum is to be used by the team after plan formulation is completed and after a selected alternative plan, as described in Guidance Memorandum #2, is identified. While some of the performance aspects should be specified in the identification of water for the natural system or for other water-related needs, the procedures described in this guidance memorandum are not intended to be sufficient to optimize the performance of the project nor to document all the types of benefits associated with the project. This guidance memorandum also describes the linkages between the identification of water and the assurances of project benefits.

4.2 APPLICABILITY

This guidance memorandum applies to PIRs for all CERP projects where the selected alternative plan has been identified and additional analyses required by WRDA 2000 are being conducted.

4.3 LEGAL FRAMEWORK FOR IDENTIFYING WATER

The requirements for identifying water are the foundation for the assurances of project benefits provisions that are contained in WRDA 2000. The programmatic regulations provide further guidance on identifying water and for providing the required assurances. The

President-Governor Agreement and the State of Florida's reservations of water statute provide the implementing mechanism for providing the assurances.

4.3.1 WRDA 2000 Requirements

Section 601(h) of WRDA 2000 sets forth specific assurances of project benefits to be achieved by implementation of the Plan. Specifically, the assurances require that the Plan be implemented to achieve and maintain the benefits to the natural system and the human environment for as long as CERP is authorized. Section 601(h)(4)(A)(iii) of WRDA 2000 describes the requirements for Project Implementation Reports and specifies that the PIR:

> "…(IV) identify the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system;
> (V) identify the amount of water to be reserved or allocated for the natural system necessary to implement, under State law, subclauses (IV) and (VI);
> (VI) comply with applicable water quality standards and applicable water quality permitting requirements under subsection (b)(2)(A)(ii);…"

4.3.2 Programmatic Regulations Requirements

In order to implement the above requirements of WRDA 2000, section 385.35(b)(2) of the programmatic regulations provides more specific guidance on identifying water to achieve the benefits of the Plan as part of the Project Implementation Report:

> "Each Project Implementation Report shall take into account the availability of Pre-CERP Baseline water and previously reserved water as well as the estimated total quantity of water that is necessary for restoration for the natural system and the quantity of water anticipated to be made available from future projects in identifying the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system, determining whether improvements in water quality are necessary to ensure that water delivered to the natural system meets applicable water quality standards; and identifying the amount of water for the natural system necessary to implement, under State law, the provisions of section 601(h)(4)(A)(iii)(V) of WRDA 2000."

The Pre-CERP Baseline is discussed in Guidance Memorandum #3 and in the Pre-CERP Baseline document.

Section 385.35(b)(3) of the programmatic regulations provides specific direction for the preparation of this guidance memorandum:

> "…The guidance memorandum shall provide a process to be used in the preparation of Project Implementation Reports for identifying the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system; determining the quantity, timing and distribution of water made available for other water-related needs of the region; determining

whether improvements in water quality are necessary to ensure that water delivered by the Plan meets applicable water quality standards; and identifying the amount of water for the natural system necessary to implement, under State law, the provisions of section 601(h)(4)(A)(iii) of WRDA 2000.

(i) The guidance memorandum shall generally be based on using a system-wide analysis of the water made available and may express the quantity, timing and distribution of water in stage duration curves; exceedance frequency curves; quantities available in average, wet, and dry years; or any other method which is based on the best available science. The guidance memorandum shall also provide for projects that are hydrologically separate from the rest of the system. The guidance memorandum also shall address procedures for determining whether improvements in water quality are necessary to ensure that water delivered to the natural system meets applicable water quality standards. These procedures shall ensure that any features to improve water quality are implemented in a manner consistent with the cost sharing provisions of WRDA 1996 and WRDA 2000.

(ii) The guidance memorandum shall generally take into account the natural fluctuation of water made available in any given year based on an appropriate period of record; the objective of restoration of the natural system; the need for protection of existing uses transferred to new sources; contingencies for drought protection; the need to identify the additional quantity, timing, and distribution of water made available by a new project component while maintaining a system-wide perspective on the amount of water made available by the Plan; and the need to determine whether improvements in water quality are necessary to ensure that water delivered by the Plan meets applicable water quality standards."

4.3.3 Reservations of Water

After water is identified, WRDA 2000 and the programmatic regulations contain additional assurances for the water made available for the natural system from each project. Specifically, WRDA 2000 requires that the State reserve this water from availability for consumptive use as part of its water supply permitting process. The State's authority to make reservations is section 373.223(4) of the Florida Statutes:

"The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be subject to period review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest."

While the reservation or allocation of water is a process solely undertaken by the State, WRDA 2000 and the programmatic regulations require that this reservation or allocation be based on the identification of water made available for the natural system outlined in the PIR.

Once the required reservations have been executed under State law, the USACE must verify that the reservation of water for the natural system was made as identified in the PIR. Specifically, the programmatic regulations require that:

> "The Project Cooperation Agreement shall include a finding that the South Florida Water Management District or the Florida Department of Environmental Protection has executed under State law the reservation or allocation of water for the natural system as identified in the Project Implementation Report. Prior to execution of the Project Cooperation Agreement, the District Engineer shall verify in writing that the South Florida Water Management District or the Florida Department of Environmental Protection has executed under State law the reservation or allocation of water for the natural system as identified in the Project Implementation Report. The District Engineer's verification shall provide the basis for the finding in the Project Cooperation Agreement and be made available to the public."

The programmatic regulations also describe the requirements should any changes to the reservations be made:

> "Reservations or allocations of water are a State responsibility. Any change to the reservation or allocation of water for the natural system made under State law shall require an amendment to the Project Cooperation Agreement.
>
> (1) The District Engineer shall, in consultation with the South Florida Water Management District, the Florida Department of Environmental Protection, the Department of the Interior, the Environmental Protection Agency, the Department of Commerce, the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, and other Federal, State, and local agencies, verify in writing that the revised reservation or allocation continues to provide for an appropriate quantity, timing, and distribution of water dedicated and managed for the natural system after considering any changed circumstances or new information since completion of the Project Implementation Report. In accordance with applicable State law, the non-Federal sponsor shall provide opportunities for the public to review and comment on any proposed changes in the water reservation made by the State.
>
> (2) The Secretary of the Army shall notify the appropriate committees of Congress whenever a change to the reservation or allocation of water for the natural system executed under State law as described in the Project Implementation Report has been made. Such notification shall include the Secretary's and the State's reasons for determining that the revised reservation or allocation continues to provide for an appropriate quantity, timing, and distribution of water dedicated and managed for the natural system after considering any changed circumstances or new information since

> completion of the Project Implementation Report. The Secretary of the Army's notification to the appropriate committees of Congress shall be made available to the public."

4.3.4 President-Governor Agreement

Section 601(h)(2) of WRDA 2000 requires that:

> "In order to ensure that water generated by the Plan will be made available for the restoration of the natural system, no appropriations, except for any pilot project described in subsection (b)(2)(B), shall be made for the construction of a project contained in the Plan until the President and the Governor enter into a binding agreement under which the State shall ensure, by regulation or other appropriate means, that water made available by each project in the Plan shall not be permitted for a consumptive use or otherwise made unavailable by the State until such time as sufficient reservations of water for the restoration of the natural system are made under State law in accordance with the project implementation report for that project and consistent with the Plan."

The President and the Governor entered into the agreement required by WRDA 2000 on January 9, 2002. The President-Governor agreement is included as Attachment 4-A.

4.4 KEY CONCEPTS FOR IDENTIFYING WATER

4.4.1 Achieving the Benefits of the Plan

Both WRDA 2000 and the programmatic regulations require that the identification of water needed to achieve the benefits of the Plan be undertaken as part of developing the Project Implementation Report. This guidance memorandum specifies how the identification of water will take place. Figure 4-1 illustrates the framework for assuring that the benefits of the Plan are achieved.

For the natural system, the assurances section of WRDA 2000 and the programmatic regulations require that all the water necessary to achieve the benefits of each project, and ultimately the Plan, be identified as each PIR is developed. WRDA 2000 and the programmatic regulations then set up specific requirements for making sure that part of this overall identification of water for the natural system is protected under Federal and State law- the water made available by each Project. However, it is key to achieving the benefits for the natural system that all the water necessary to achieve these benefits be identified – both water going to the natural system prior to implementation of CERP and water made available for the natural system by CERP projects - in order to ensure that the Plan's goals and purposes for the natural system are ultimately achieved. For this reason, this guidance memorandum requires identification of all water necessary to achieve the natural system benefits and water for other water-related needs.

As required by the programmatic regulations, each Project Operating Manual must be consistent with the reservation undertaken by the State, and the USACE must verify that the State has reserved or allocated the water as identified in the PIR before entering into a Project Cooperation Agreement. This consistency will be obtained by utilizing the operating criteria from the model run in the PIR for the selected alternative plan to develop the operating manual and the output from this same model run to identify the water to be managed and dedicated for the natural system.

The process of identifying water is integral to the specific assurances of WRDA 2000 and ultimately to ensuring that the overarching objective of the Plan – restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including flood protection and water supply – are met.

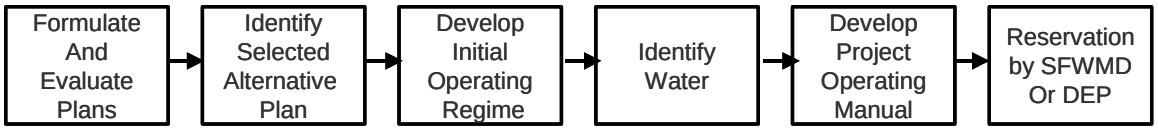


Figure 4-1: Relationship Among Assurances Elements

4.4.2 Beneficial Water for the Natural System

Identification of water for the natural system is based on a concept of "beneficial water." Beneficial water for the natural system is the water required for the protection of fish and wildlife within natural systems, including water that contributes to meeting hydrologic, water quality, and ecologic targets for restoration of natural systems. Not all water discharged to natural areas is necessarily beneficial water. Hydrologic, water quality, and ecologic targets for the natural system will be utilized to measure which of these existing supplies is beneficial to the natural system, versus that which may be harmful to it or otherwise not contributing to the natural system targets. Figure 4-2 illustrates the concept of beneficial water for the natural system.

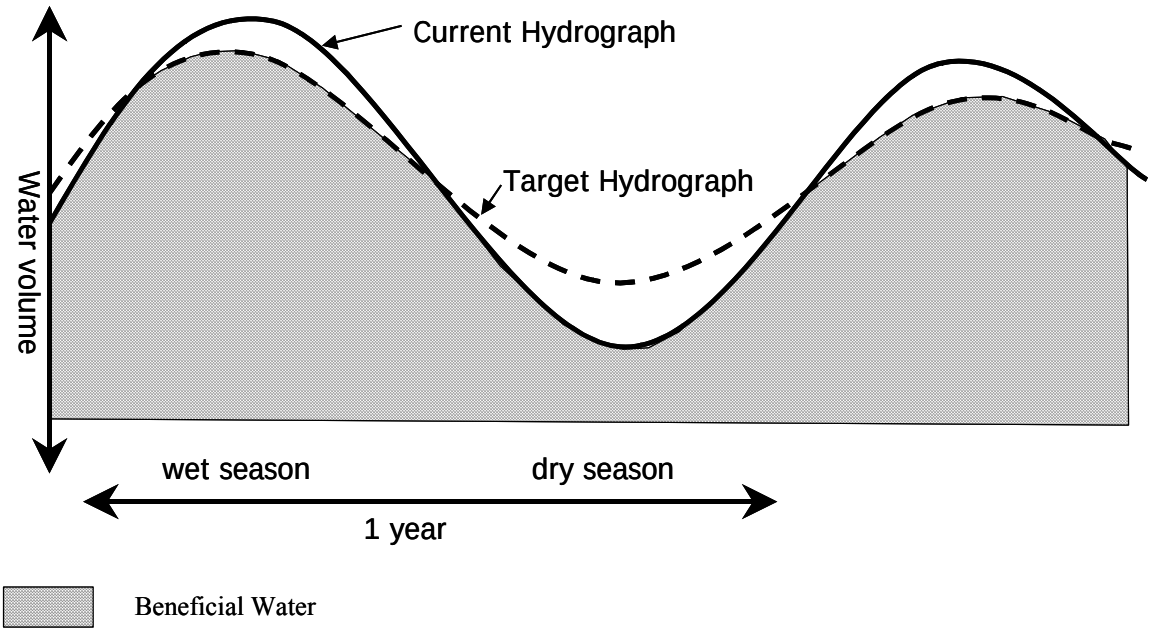


Figure 4-2: Beneficial Water for the Natural System

4.4.3 Existing Water and Water Made Available

The identification of water involves both: 1) water existing in the system at the time of PIR development that is available and beneficial to the natural system and available for other water-related needs and; 2) water made available by a project that is beneficial to the natural system and for other water-related needs. The sum of these two categories is the total water that is expected to be available and beneficial to the natural system and available for other water-related needs. The sum of available and beneficial water existing in the system and water made available with all CERP projects in place is the total water that is expected to be available as a result of the Plan.

The first category of water is water existing in the C&SF Project system at the time of development of the PIR that is both beneficial for the natural system and available. This water is composed of existing water supply in the C&SF Project system that is available to meet natural system targets and which is required for the protection of fish and wildlife, and water that is available for other water-related needs. The Existing Conditions PIR Baseline represents this condition. If the State has previously undertaken actions to protect the water for the natural system (for example, through a non-CERP or initial reservation or other available means), the Project Delivery Team should include the State's action in the quantification of the existing water in the Existing Conditions PIR Baseline. For areas where the State has not previously taken action to protect the existing and available water for the natural system in the C&SF Project system identified in the Existing Conditions PIR Baseline, the Project Delivery Team should quantify the existing water.

The second category of water that the Project Delivery Team must identify is water that is made available by the project. Water made available is defined by the programmatic regulations as "the water expected to be generated pursuant to the implementation of a Project of the Plan in accordance with the Project Implementation Report for that Project." The water made available includes both beneficial water for the natural system and water for other water-related needs. For purposes of quantifying water made available for the natural system, this quantification includes any changes the project makes in the quantity, timing, or distribution of water from the Existing Conditions PIR Baseline that is beneficial. This is the water that will be reserved by the State pursuant to Section 601(h)(4)(A)(iii)(V) of WRDA 2000.

4.4.4 Basins for Identifying Water

The major regions of the South Florida ecosystem have been separated into water basins for identifying water and are shown as Figure 3-H-1 and listed in Table 3-H-1 in Attachment 3-H of Guidance Memorandum #3. Taken together, these water basins represent the entire South Florida ecosystem and provide a system-wide accounting of water.

Several basins within the South Florida ecosystem include both natural areas and developed lands. Water in these basins must be subdivided into water beneficial to natural systems and water for other water-related needs. Attachment 4-D contains guidance on delineation of natural and developed areas within water basins.

Individual PIRs may also need to quantify water at a sub-basin level in order to identify water provided to meet specific project purposes. Water should be quantified for sub-basins in which the PIR has identified project benefits, including beneficial water retained in natural areas, improvements in the timing and distribution of water delivered to estuaries, water used to recharge groundwater used as supply, and stormwater treatment areas. Attachment 4-D contains guidance in identification of areas where water should be quantified at a sub-basin scale.

4.5 IDENTIFICATION OF WATER

4.5.1 Introduction

In general, the identification of the quantity of water for the natural system and other water-related needs follows similar procedures and requires the same type of model and the same baseline assumptions. For natural systems, additional steps are required to determine how much of the available water is beneficial to the protection of fish and wildlife according to restoration targets. Other aspects of the guidance included in this section are consideration of system-wide and project-level effects, water quality concerns, and consistency with the verification requirements of the programmatic regulations. Attachment 4-D provides a detailed technical step-by-step guide for the identification of water.

4.5.2 Overview of Identifying Water for the Natural System

Water that is identified for the natural system must be quantified using parameters that adequately describe the quantity, timing, and distribution of beneficial water for the natural system to be protected. Selecting the appropriate parameters for quantification is especially crucial for water made available by the project for the natural system because this information will be utilized by the State in developing the reservation of water pursuant to State law. The type of parameters used to quantify the water for the natural system will vary based on the type of natural system benefited by the project and the type of benefit to be achieved (e.g., water quality benefit versus water quantity benefit) as discussed elsewhere.

Water for the natural system must be identified for a wide range of natural areas including fresh and salt-water bodies and impounded and free-flowing marshes, rivers, and lakes. Three water budget components should be identified for each natural area: total inflows, total outflows, and storage of water in the area (Total flow is the sum of structural flow, surface water, and groundwater.). If water level alone is used, systems managed without flow or with too much flow would still satisfy the protections. The latter is of particular concern where nutrients concentrations are high because increases in flow through an area would mean higher nutrient loads. In addition, as an indicator of impacts to a natural area, water level may not be as sensitive as flow. Conversely, if flow alone is used, major changes in habitat types could occur if stage is not specified. The importance of each of these components depends on the type of natural area. For instance, in estuaries and other coastal zones, freshwater inflow is the most important component since changes in storage and outflow are uncontrolled. Stormwater Treatment Areas (STAs), depth (or storage) and other factors such as residence time are the components that are most linked to the function of the natural area. Regardless of the water budget component quantified, inter-annual variability of the available water should be presented using a volume-probability curve and the timing of the available water should be reported on a seasonal basis.

In order to promote consistency between the identification process in the PIRs and the State's reservation process, the PIR should provide the following information:

- The original source of water made available for the natural system;
- The potential conveyance route(s) of the water made available for the natural system;
- The quantification of the amount of water made available for the natural system both on a system-wide and project-specific basis;
- An estimate of when the water will become available for the natural system;
- The relevant elements defining the hydrologic conditions such as water year, wet season, dry season and a return period;
- Identify the restoration water bodies or areas that will be benefited; and
- The description of how the water made available for the natural system protects fish and wildlife.

4.5.3 Overview of Identifying Water for Other Water-Related Needs

Water made available by a CERP project for other water-related needs must be quantified based on the goals and purposes of the project as set forth in the Plan. The Plan contains goals and purposes for meeting both water supply and flood protection needs, which change through time up to 2050. These needs change as a result of increasing water supply demand projections and changing land uses. The other water-related needs assumed in the Plan include:

- Water supply for urban, tribes, and agriculture
- Water for resource protection (i.e., deliveries to canals to prevent saltwater intrusion, aquifer recharge)

These changing needs are to be met through appropriate management by the State of its presently existing water resources and water made available for other water-related needs through implementation of Plan projects.

To adequately identify the amount of water made available by a project for other water-related needs, the PIR should at a minimum provide the following information:

- The original source of the water made available
- The potential conveyance route(s) of the water made available
- The quantification of the amount of water made available both on a system-wide and a project specific basis
- An estimate of when the water will become available
- The relevant element defining the hydrologic conditions such as the water year, wet season, dry season, and return period.

4.5.4 Methodology for Identifying Water

This section identifies the modeling comparisons the Project Delivery Team will use in preparing the PIR to identify water for the natural system, other water-related needs and water beyond specific project purposes. Specific instructions on selection of models and treatment of hydrologically separate projects are provided in Attachment 1-A of Guidance Memorandum #1.

4.5.4.1 Initial Operating Regime

After the selected alternative plan has been identified, the Initial Operating Regime will be developed. The initial operating regime will be first modeled by including the selected alternative plan along with all previously authorized CERP projects with approved operating plans, and non-CERP projects with approved operating plans. Development of the initial operating regime will be guided by the purposes of the selected alternative plan. Land use and demand projections as reflected in the Plan at the end of the planning horizon (currently to 2050) will be used in developing the initial operating regime. This initial operating regime accounts for all the water in the system with the selected alternative plan in place. The

modeling for the initial operating regime will be optimized to meet the selected alternative plan purposes, goals, and planning objectives subject to the constraints of the existing system. Performance of the initial operating regime will be documented using project and system-wide performance measures. The Initial Operating Regime will be used to prepare the Operating Manuals.

4.5.4.2 Identifying Water

The identification of water will be conducted system-wide using the water basins shown as Figure 3-H-1 and listed in Table 3-H-1 in Attachment 3-H of Guidance Memorandum #3. Taken together, these basins represent the entire South Florida ecosystem and provide a system-wide accounting of water. The identification of water (i.e. beneficial natural system water and water for other water-related needs) will be determined for each basin. Where appropriate, basins will be subdivided as necessary to identify beneficial water for natural systems and water for other water-related needs. Probability curves of storage, inflow and outflow volumes, as described in Attachment 4-D, will be developed based on the water budget for each water basin. Each PIR will identify water in all of the water basins simultaneously (i.e., using the same model run) to express the cumulative quantity, timing, and distribution of water for the natural system and water available for other water-related needs.

As this process is followed for each successive PIR, each PIR will incrementally increase the total water made available until ultimately all of the water that is expected to be made available by the Plan is actually made available. In effect, this creates a system-wide accounting system for water that changes as the result of implementation of each project. This ensures that the effects of each project on water availability are analyzed and accounted for on a system-wide basis.

Identifying Water for the Natural System

The PIR will identify beneficial water that is made available for the natural system as follows:

1. The Initial Operating Regime will be compared to the Existing Conditions PIR Baseline and the difference in beneficial water available for the natural system will be quantified.

The PIR will identify the water to be reserved for the natural system under State law as the beneficial water for the natural system made available by the project. It is likely that a particular selected alternative plan will not affect all water basins; in that case, the identification of water to be reserved for the natural system would show no change from the Existing Conditions PIR Baseline in basins that are not affected.

Identifying Water for Other Water-Related Needs

The PIR will identify water that is available for other water-related needs as follows:

1. The Initial Operating Regime will be compared to the Existing Conditions PIR Baseline and the difference in water available for other water-related needs in these two conditions will be calculated ("Condition A"). This is the amount of water that the project would be expected to deliver for other water-related needs assuming no other CERP projects or non-CERP activities are implemented.

2. The Next-Added Increment Baseline plus the selected alternative plan (i.e. Next-Added Increment) will be compared to the Existing Conditions PIR Baseline and the difference in water made available for other water-related needs in these two conditions will be calculated ("Condition B"). This is the amount of water that the project would be expected to deliver for other water-related needs assuming no other CERP projects are implemented and all non-CERP activities in the Future Without CERP Baseline are implemented.

3. The Project Delivery Team will compare the quantity of water made available for other water-related needs at the time the project becomes operational as represented in "Condition A," to the quantity of water made available in 2050 for other water-related needs, as represented in "Condition B." The condition which has less water available for other water-related needs will be designated the total quantity of water made available by the project. If "Condition B" is less than "Condition A," the difference in water quantities in the two conditions may be available for an identified time period to meet other water-related needs, as designated by the State.

4.6 PROJECT IMPROVEMENTS IN WATER QUALITY

In general, water quality must be considered for all CERP projects during project plan formulation and evaluation. The project's effects on water quality, both from a construction and from an interim and long-term operational perspective must be considered as part of the identification and selection of the alternative plan to be recommended in the PIR. Improvements in water quality necessary to meet applicable water quality standards and to achieve ecosystem restoration are included in plan formulation and evaluation work leading up to the selection of the alternative plan to be recommended. The selected alternative plan is then evaluated to determine the quantity of beneficial water made available by the project for the natural system and made available for other water-related needs of the South Florida region. Features to improve water quality are included, if necessary, in the selected alternative plan, and the hydraulic effects (if any) of those features on the quantities of water to be identified are considered in the plan selection process.

As a result, the requirements of this guidance memorandum to address improvements in water quality necessary to ensure that water delivered by the Plan meets applicable water quality standards have been addressed in the application of the Plan Formulation and Evaluation procedures of Guidance Memorandum #2, which resulted in the selected alternative plan to which the technical methodologies in this guidance memorandum then apply. The requirement of Section 385.35(b)(3)(i) that the procedures will ensure that any

features to improve water quality are implemented in a manner consistent with the WRDAs of 1996 and 2000 are included in Guidance Memorandum #2.

4.7 TOTAL WATER ACCOUNTING

The programmatic regulations require that a document be prepared annually that includes, a water budget for the Plan using the water basins shown in Figure 3-H-1 and listed in Table 3-H-1 in Attachment 3-H of Guidance Memorandum #3. The annual requirement for a water budget provides a system-wide accounting mechanism for the total water expected to be generated by the Plan. The annual water budget should be updated to include the projects recommended in completed PIRs and the water identified for the natural system. This total water accounting should also describe the water that has been reserved for the natural system under State law for CERP as well as the total amount of water for the natural system that is expected to be made available by CERP.

4.8 PROVIDING ASSURANCES OF PROJECT BENEFITS

4.8.1 State Tools for Providing Assurances

Provisions in Federal and State law ensure that CERP implementation will achieve and maintain the benefits of the natural system and the human environment and the goals of the Plan. For purposes of providing background, these assurances are described in a summary of the applicable State and Federal authorities contained in Attachment 4-B.

4.8.2 Assurance Language for the PIR

The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Federal Government and the State of Florida are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to achieve and maintain the benefits to the natural system described in the Plan. As envisioned in WRDA 2000 and the programmatic regulations, each Project Implementation Report will identify this appropriate quantity, quality, timing, and distribution of water for the natural system.

The State will protect the water for the natural system by taking the following actions: 1) the State will use its water reservation authority to reserve the beneficial water made available for the natural system from each project as required by WRDA 2000; and 2) the State will protect the existing water that the Project Implementation Report identifies is available and beneficial to the natural system, using resource protection authority under Florida law. Language setting forth these commitments will be included in the “Project Assurances Section” of each PIR (See Guidance Memorandum #1, Attachment 1-C “PIR Outline”). Model language memorializing this concept is contained in Attachment 4-B.

4.8.3 Verification Process for PCAs

Section 385.27 of the programmatic regulations requires that the USACE verify that the State has reserved the water for the natural system as identified in each PIR. In order for the USACE to perform this verification process, the Project Delivery Team needs to clearly describe and label all the information developed in the PIR for this component of water. The USACE will use the details set forth in the PIR to evaluate the information contained in the State's reservation to ensure consistency between the reservation and the identification of the water made available in the PIR.

4.8.4 Changes in Water Reservations

Section 385.27 of the programmatic regulations requires that any changes in water reservations for CERP projects that are made under State law require an amendment to the Project Cooperation Agreement. The Jacksonville District Engineer is required to verify, in consultation with other Federal, State, and local agencies and the Tribes that the revised reservation still continues to provide for an appropriate quantity, timing, and distribution of water dedicated and managed for the natural system after considering any changed circumstances or new information since completion of the Project Implementation Report. In accordance with applicable State law, the non-Federal sponsor is to provide opportunities for the public to review and comment on any proposed changes in the water reservation made by the State.

In addition, the programmatic regulations require that the Secretary of the Army notify the appropriate committees of Congress whenever a change to the reservation has been made. The notification must include the Secretary's and the State's reasons for determining that the revised reservation or allocation continues to provide for an appropriate quantity, timing, and distribution of water dedicated and managed for the natural system after considering any changed circumstances or new information since completion of the Project Implementation Report. The Secretary of the Army's notification to the appropriate committees of Congress will be made available to the public.

ATTACHMENT 4-A
CERP ASSURANCE OF PROJECT BENEFITS AGREEMENT
(PRESIDENT-GOVERNOR AGREEMENT)

COMPREHENSIVE EVERGLADES RESTORATION PLAN ASSURANCE OF PROJECT BENEFITS AGREEMENT

WHEREAS, the Everglades ecological system is unique in the world and one of the Nation's great treasures;

WHEREAS, the Central and Southern Florida Project as originally authorized in 1948 has had unintended consequences on the Everglades and the South Florida Ecosystem;

WHEREAS, the Water Resources Development Act of 1992 authorized a Comprehensive Review Study (Restudy) of the Central and Southern Florida Project;

WHEREAS, as required by the Water Resources Development Act of 1996, the Restudy was submitted to the Congress of the United States on July 1, 1999;

WHEREAS, the Restudy, renamed the Comprehensive Everglades Restoration Plan, was authorized by the Congress in the Water Resources Development Act of 2000;

WHEREAS, the Comprehensive Everglades Restoration Plan (the "Plan") will restore, preserve, and protect the more than 2.4 million acres of the Everglades and the South Florida Ecosystem;

WHEREAS, implementation of the Plan will require a collaborative effort among Federal and State partners, and the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida, acting under Federal and State law, to achieve the shared goal of restoration of the Everglades and the South Florida Ecosystem;

WHEREAS, as the ecosystem is restored, all interests seek a level of assurance that they will receive the anticipated benefits from the Plan;

WHEREAS, the Federal interest in restoration flows largely from the substantial Federal resources in the ecosystem, including Everglades National Park and other National Parks, National Wildlife Refuges, and National Marine Sanctuaries, which comprise a significant portion of the natural system;

WHEREAS, in recognition of this interest, the Congress established that the overarching objective of the Plan is the restoration, preservation, and protection of the South Florida Ecosystem, while providing for other water-related needs of the region, including water supply and flood protection;

WHEREAS, section 601(h)(2) of the Water Resources Development Act of 2000 (the "Act"), requires that the President of the United States and the Governor of Florida enter into a binding agreement that ensures that water from the Comprehensive Everglades Restoration Plan will be made available for the restoration of the natural system;

WHEREAS, section 601(h)(3) of the Act further requires that the Secretary of the Army, with the concurrence of the Governor and the Secretary of the Interior, and in consultation with the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the Administrator of the Environmental Protection Agency, the Secretary of Commerce, and other Federal, State, and local agencies, promulgate programmatic regulations to ensure that the goals and the purposes of the Plan are achieved;

WHEREAS, section 601(h)(4)(A)(iii) of the Act requires that a Project Implementation Report (PIR) identify the amount of water to be reserved or allocated for the natural system under State law;

WHEREAS, section 601(h)(4)(B)(ii) of the Act requires that the Secretary of the Army shall not execute a Project Cooperation Agreement until any reservation or allocation of water for the natural system identified in the PIR is executed under State law;

WHEREAS, the State of Florida has the authority to reserve water for the natural system pursuant to Chapter 373, Florida Statutes;

The signatories to this agreement hereby affirm that:

As required by the Water Resources Development Act of 2000, water made available by each project in the Comprehensive Everglades Restoration Plan will not be permitted for a consumptive use or otherwise made unavailable by the State of Florida until such time as sufficient reservations of water for the restoration of the natural system are made by regulation or other appropriate means pursuant to Chapter 373, Florida Statutes, and in accordance with the project implementation report for the project and consistent with the Comprehensive Everglades Restoration Plan.

To effectuate this agreement, the Federal party agrees:

- To include within the President's budget submissions to the Congress requests for Federal appropriations in the amount the President deems necessary to implement the Federal share of the Plan's implementation;

- To initiate authorized project planning and design;
- To work with the State of Florida on developing information jointly to support the adaptive assessment component of the Plan;
- To use the planning process to supply information for both Federal and State legislative oversight requirements;

To effectuate this agreement, the State party agrees:

- To include within the Governor's budget submissions to the Legislature requests for State appropriations in the amount the Governor deems necessary to implement the State share of the Plan's implementation.
- To undertake reservations of water for the natural system upon completion of each PIR, and to ensure that reservations of water for the natural system will be consistent with information developed in the PIR, indicating appropriate timing, distribution, and flow requirements sufficient for the restoration of the natural system.
- To manage its water resource allocation process to ensure that water made available by each project in the Comprehensive Everglades Restoration Plan will not be permitted for a consumptive use or otherwise made unavailable for restoration of the natural system, consistent with the PIR and the provisions of the Water Resources Development Act of 2000.
- To monitor and assess the continuing effectiveness of reservations as long as the project is authorized to achieve the goals and objectives of the Plan.

PRESIDENT OF
THE UNITED STATES

GOVERNOR OF THE
STATE OF FLORIDA

Dated: January 9, 2002

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ATTACHMENT 4-B
STATE TOOLS FOR PROVIDING ASSURANCES

State law includes provisions that were specifically enacted to implement the Plan by the State as a partner with the Federal government. State law also contains provisions that will be utilized to reserve and allocate water to the natural system and for other water-related needs, sometimes referred to as "State water law." These legal tools provided under State water laws include water reservations, consumptive use permitting, water shortage management, and minimum flows and levels.

State and Federal law specifically provide that State water law controls the procedures and implementation of water reservations and allocation of water for natural systems and other water-related needs and that nothing in the Federal law should be interpreted as prescribing the process for implementing State water law. A description of the key provisions in State water law are provided in he following paragraphs solely to provide background for the guidance memoranda, as they will play a key role in assuring that the goals and purposes of the Plan will be achieved.

STATE LAWS REGARDING CERP IMPLEMENTATION

The primary State authority regarding the implementation of the Plan is Chapter 373, F.S. These provisions provide responsibility to the State, including the SFWMD and the Florida Department of Environmental Protection (FDEP), to ensure restoration of the Everglades and the protection of existing legal uses of water and existing levels of flood protection when designing and implementing CERP project components.

Assurances are provided under State law requiring the Plan be used as a "guide and framework…to ensure that the project components will be implemented to achieve the purposes of the WRDA 1996 that include restoring, preserving and protecting the South Florida ecosystem, …and providing such features as are necessary to meet the other water-related needs of the region, including flood control, the enhancement of water supplies, and other objectives served by the project." Section 373.470(3)(b)2, F.S.

To meet these assurances, State law provides specific provisions that apply to implementing, funding, and permitting of CERP projects. These include Sections 373.026(8), 373.1501, 373.1502, and 373.470, F.S. They are summarized in the following paragraphs.

Prior to any project component being submitted to Congress for authorization or receipt of an appropriation of State funds for construction, the FDEP must approve each project component, pursuant to Section 373.026(8), F.S., upon a finding that the SFWMD has complied with the requirements set forth in Section 373.1501, F.S.

Section 373.1501(2), F.S., in part, provides that CERP components must be implemented through appropriate processes under Chapter 373 and consistent with the balanced policies

and purposes of Chapter 373, F.S. Specifically, Section 373.1501(5) provides assurances to natural systems, existing legal users and for flood protection, including requirements that SFWMD for each project component:

> (a) Analyze and evaluate all needs to be met in a comprehensive manner and consider all applicable water resource issues, including water supply, water quality, flood protection, threatened and endangered species, and other natural system and habitat needs.
>
> (b) Consistent with [Chapter 373], the purposes for the Restudy provided in the WRDA of 1996, and other applicable Federal law, provide reasonable assurances that the quantity of water available to existing legal users shall not be diminished by implementation of project components so as to adversely impact existing legal users, that existing levels of service for flood protection will not be diminished outside the geographic area of the project component, and that water management practices will continue to adapt to meet the needs of the restored natural environment.

Prior to executing a PCA, the SFWMD must develop a PIR with the USACE to address the requirements in Section 373.1501, F.S., and to obtain approval under Section 373.026, F.S., from the FDEP. This ensures that the PIR will be sufficient to meet both State, as well as Federal, law requirements for implementing a CERP project.

STATE LAWS FOR RESERVING, ALLOCATING AND MANAGING WATER RESOURCES

As mentioned above, in addition to laws specifically enacted to implement the Plan, State law also includes a framework of several tools for reserving, allocating and managing water for the natural system and other water-related needs. These tools will play a key part in providing assurances that the goals and purposes of the Plan will be achieved as required by both State and Federal law. They are briefly summarized in the following paragraphs.

Reservations of Water for the Natural System

Section 373.470(3)(c), F.S., requires that each PIR identify the increase in water supplies resulting from a project component. These increased water supplies for the natural system must be allocated or reserved by the SFWMD under Chapter 373, F.S. Section 373.470(3)(c), F.S.

State law on water reservations, in Section 373.223(4), F.S., provides:

> "The governing board or the department, by regulation, may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. Such reservations shall be

subject to periodic review and revision in the light of changed conditions. However, all presently existing legal uses of water shall be protected so long as such use is not contrary to the public interest."

When water is reserved under this statute, it is not available to be allocated for use under a consumptive use permit and is protected for the natural system. The SFWMD anticipates that both CERP and non-CERP related reservations will be adopted for Everglades protection. For Plan reservations, the amount of water to be reserved is the water made available for the protection of fish and wildlife by a Plan project. That is the water quantified pursuant to the methods set forth in Guidance Memorandum #4.

Pursuant to WRDA 2000, CERP reservations for a specific project must be executed prior to entering into the PCA for the project. However, reservations are subject to periodic review based on changed conditions, such as the changes that will occur in the C&SF Project as Plan projects become operational. This provides flexibility to account for changes in implementation strategies, restoration objectives, and contingency plans during the life of the project.

Presently existing legal uses of water are protected so long as they are "not contrary to the public interest." Under Florida law, permitted uses and domestic water uses (which are exempt from requirements to obtain a permit) have the legal status of an "existing legal use." Unauthorized, including unpermitted, existing uses do not constitute an "existing legal use" and are not protected by the statute.

There are protections to ensure the benefits for the natural system described in the Plan are achieved in concert with the reservation of project water based on the analysis using the methods set forth in Guidance Memorandum #4. This analysis includes the demand projections in the Plan, currently 2050. The State will use the following to protect these benefits:

1. Develop a reservation rule that includes supplemental information identifying the expected water to be made available for the natural system and for other water-related needs based on the system formulation analysis to reflect the projected performance of the project through time up to the end of the period of analysis (currently 2050) ensuring that the benefits of the Plan will be achieved. The reservation rule will include language that the reservation will be updated in the future as necessary to meet the actual changed conditions as quantified in future PIRs. The reservation rule will be reviewed and revised appropriately, at least every five years.

2. Include a limiting condition in consumptive use permits stating that upon renewal a permit shall be modified as necessary to comply with consumptive use permit rules that ensure such use is consistent with the CERP goals and purposes, including adopted reservations.

The SFWMD is in the process of developing initial reservations of water for key areas within the South Florida ecosystem, including Everglades National Park and the Water

Conservation Areas. These initial reservations will set aside existing beneficial water that is required for the protection of fish and wildlife. It is expected that these initial reservations will provide the basis upon which CERP project reservations will build by reserving water made available by each project component.

Consumptive Use Permitting

In order to obtain a consumptive use permit, the permit applicant must provide reasonable assurances that the use is "reasonable-beneficial", will not interfere with any presently existing legal use of water, and is consistent with the public interest, pursuant to Section 373.223, F.S. The SFWMD implements this three-prong test pursuant to SFWMD rules, including Chapters 40E-2 and 40E-20, Florida Administrative Code (F.A.C.). Permits are conditioned to assure that uses are consistent with the overall objectives of Chapter 373, F.S. and are not harmful to the water resources of the area. Protection of water supplies for restoration of the Everglades natural system under CERP is recognized as a legitimate and essential component of consumptive use permitting pursuant to Chapter 373, Florida Statutes.

As part of this "three prong" permitting test for consumptive use permits, the SFWMD's rules contain requirements to demonstrate that a consumptive use will not cause harm to wetlands and other surface waters, will not cause pollution of the water resources, and will not cause saltwater intrusion. Water reservations are also key tool to ensure that consumptive uses are permitted consistent with meeting the goals and purposes of the Plan.

Permit durations under Florida law are tied to the time period for which the applicant can provide reasonable assurances that the use will not be harmful to the water resources of the area and are consistent with the overall objectives of the district. Under current district rules, duration of permits for water from the Central and Southern Florida Project are limited to allow renewal of existing levels of use for up to 20 years and to allow increased allocations over existing levels of use for a five year interval.

Under the "public interest" test the SFWMD is authorized to consider whether the project impacts fish and wildlife, among several other potential impacts and benefits of authorizing a given consumptive use of water. These "public interest" considerations are outlined in Chapter 373, F.S., including Section 373.016, F.S., which identifies the protection of fish and wildlife and development of water resources for meeting existing and future reasonable-beneficial uses of water. Section 373.1501(2), F.S, specifically requires that CERP implementation be consistent with the balanced policies and purposes of Section 373.016, F.S. Section 373.1502(2)(a) provides that implementation of CERP is in the public interest.

Minimum Flows And Levels

Minimum flows are established to identify where further withdrawals would cause significant harm to the water resources, or to the ecology of the area. Minimum levels are established to identify where further withdrawals would cause significant harm to the water

resources of the area. Specific minimum flows and levels (MFLs) are established by rule for specified priority water bodies that have been designated pursuant to Section 373.042(2), F.S.

Minimum flows and level rules have been adopted for several areas within the C&SF Project, including Everglades National Park and the Water Conservation Areas, which are contained in Chapter 40E-8, F.A.C. The recovery strategy for meeting these MFLs includes implementation of CERP and the SFWMD's Lower East Coast Regional Water Supply Plan (2000), which includes Plan components. Under SFWMD MFL rules for these areas consumptive use permit applicants must demonstrate that their use is consistent with this recovery strategy. As such, MFLs are a key component in assuring that the goals and purposes of CERP will be achieved.

Water Shortage Implementation

Pursuant to Section 373.246, F.S., water shortage declarations are designed to prevent serious harm from occurring to water resources during drought conditions, when shortfalls of water occur. Declarations of water shortages by the SFWMD Governing Board are used to equitably distribute the water resources for consumptive and non-consumptive uses during droughts, including fish and wildlife, as provided in Chapter 40E-21, F.A.C. Water shortage declarations are imposed in phases, with increasing water use cutbacks with increasing drought conditions. CERP Project Operating Manuals include drought contingency plans, which incorporate these water shortage rules for information purposes.

ATTACHMENT 4-C
MODEL LANGUAGE FOR ASSURANCES SECTION OF THE PIR

The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Federal Government and the State of Florida are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to achieve and maintain the benefits to the natural system described in the Plan. As envisioned in WRDA 2000 and the programmatic regulations, each Project Implementation Report will identify this appropriate quantity, quality, timing, and distribution of water for the natural system.

The State will protect the water for the natural system by taking the following actions: 1) the State will use its water reservation authority to reserve the beneficial water made available for the natural system from each project as required by WRDA 2000; and 2) the State will protect the existing water that the Project Implementation Report identifies is available and beneficial to the natural system, using resource protection authority under Florida law.

The following language setting forth these commitments will be included in the "Project Assurances Section" of each PIR (See Guidance Memorandum #1, Attachment 1-C "PIR Outline"):

> "The overarching objective of the Plan is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. The Federal Government and the non-Federal sponsor are committed to the protection of the appropriate quantity, quality, timing, and distribution of water to ensure the restoration, preservation, and protection of the natural system as defined in WRDA 2000, for so long as the project remains authorized. This quantity, quality, timing, and distribution of water shall meet applicable water quality standards and be consistent with the natural system restoration goals and purposes of CERP, as the Plan is defined in the programmatic regulations. The non-Federal sponsor will protect the water for the natural system by taking the following actions to achieve the overarching natural system objectives of the Plan:
>
> 1. Ensure, through appropriate and legally enforceable means under Florida law, that the quantity, quality, timing, and distribution of existing water that the Federal Government and the non-Federal sponsor have determined in this Project Implementation Report is available and beneficial to the natural system, will be available at the time the Project Cooperation Agreement for the project is executed and will remain available for so long as the Project remains authorized.

2a. Prior to the execution of the Project Cooperation Agreement, reserve for the natural system the beneficial water that the Federal Government and the non-Federal sponsor have determined in this Project Implementation Report will be made available by the project.

2b. After the Project Cooperation Agreement is signed and the project becomes operational, make such revisions under Florida law to this reservation of water that the non-Federal sponsor determines, as a result of changed circumstances or new information, is beneficial for the natural system.

3. For so long as the Project remains authorized, notify and consult with the Secretary of the Army should any revision in the reservation of water or other legally enforceable means of protecting water be proposed by the non-Federal sponsor, so that the Federal Government can assure itself that the changed reservation or legally enforceable means of protecting water conform with the non-Federal sponsor's commitments under paragraphs 1 and 2. Any change to a reservation of water made available by the project shall require an amendment to the Project Cooperation Agreement."

ATTACHMENT 4-D
TECHNICAL PROCEDURE FOR THE IDENTIFICATION OF WATER FOR THE NATURAL SYSTEM AND FOR OTHER WATER-RELATED NEEDS

This attachment provides a step-by-step guide for performing the calculations required to identify water for the natural system and for other water-related needs. It is intended to be used by technical staff on the Project Delivery Team. The detailed guidance describes requirements and offers suggestions in implementing each of the steps:

Step 1: Determine the areas for which water should be quantified for the natural system and other water-related needs.

Step 2: Select the model and associated results to perform the analyses.

Step 3: Identification of beneficial water for the natural system

Step 4: Identification of water for other water-related needs

Step 5: Graphically display the beneficial water made available for the natural system and water for other water-related needs results.

Step 6: Documentation requirements: documentation of methods and decisions; narrative explanation of the graphical results; summary table of water made available for different purposes and locations.

STEP 1. DETERMINE THE AREAS FOR WHICH WATER SHOULD BE QUANTIFIED FOR THE NATURAL SYSTEM AND FOR OTHER WATER RELATED NEEDS

During plan formulation and evaluation, the Project Delivery Team should use the procedure in Attachment 1-A of Guidance Memorandum #1 to determine whether the project is hydrologically connected to, or separate from, the regional water management system and to determine the spatial extent of project effects. The Project Delivery Team is responsible for quantifying, within that geographical boundary, all beneficial water made available for the natural system and water for other water-related needs. Water made available by the project on both the system-wide (or regional, if applicable) and project-level scales should be identified for the natural system and for other water-related needs.

After the geographical extent of the project's effects on water availability has been determined, the project-specific effects and system-wide effects should be displayed in tabular form along with brief summary statements describing the project's effects (see Table 4-D-1).

Table 4-D-1: Project Effects

CERP Project Name		
Project – Level Effects		
Performance Measure	Target	Project Effects
System – Wide Effects		
Affected Area		Project Effects

Most of the components that comprise the Plan are hydrologically connected. For these projects, beneficial water for the natural system and water for other water-related needs should be identified based on both system-wide and project-level effects. For components of the Plan that are hydrologically separate from the regional water management system, the identification of beneficial water would only involve identifying natural areas within the basin or watershed in which the project is located, or within project features that benefit from the delivery of water from the project. Similarly, the identification of water made available by a hydrologically separate project for other water-related needs would involve identifying consumptive and non-consumptive uses within the basin or watershed in which the project is located that may be affected by the water made available by the project. While a project may be hydrologically separate from the regional water management system, it may have effects outside of the intended footprint or basin. For example if the Project Delivery Team discovers that the project results in a change to the boundary condition in the sub-regional model, the project has created system-wide effects and can no longer be considered to be hydrologically separate.

Generally beneficial water for the natural system and water for other water-related needs should be quantified for basins where structural or operational changes occur and in any other basin where the boundary fluxes for the "with condition" are different than the "without condition" (i.e. Existing Conditions PIR Baseline). These basins represent areas in which water has been delivered or redistributed by the CERP project for the natural system and other water-related needs.

It is important to remember that while system-wide effects on the spatial distribution of beneficial water for the natural system and water for other water-related needs may be small in magnitude, they represent large total volumes of water and should be quantified.

Natural Systems

The Project Delivery Team should identify the beneficial water for the natural system for each of the basins identified within the spatial extent of project effects that contributes to the protection of fish and wildlife.

As discussed in Section 4.4.4, the South Florida ecosystem is divided into basins that include both natural areas and developed lands. Beneficial water made available by the project for the natural system must be quantified for each basin contained within the geographical boundary of project effects. The basins shown in Figure 3-H-1 and listed in Table 3-H-1 of Guidance Memorandum #3 may be subdivided for projects that have been determined to have beneficial project-level effects on the natural system in a specific basin. Information from the formulation and evaluation process (e.g., significant resources defined in Guidance Memorandum #2) as well as landcover maps combined with field information can assist the Project Delivery Team in delineating natural areas within basins. For assistance identifying natural areas requiring consideration, the Project Delivery Team should consult with Federal, State and local resource management agencies and make use of spatial data sources described in, "Spatial Data for Use in Identifying Existing Legal Sources of Water for Fish and Wildlife" (U.S. Fish and Wildlife Service, In Preparation).

While the Project Delivery Team must identify and quantify beneficial water made available to natural areas, it is recognized that CERP projects may also create incidental benefits to many natural systems that are not linked to the goals and purposes of the project. The Project Delivery Team is encouraged to identify and quantify all benefits observed as a result of the project.

Examples of types of natural systems that are important to fish and wildlife are listed below:

- Rivers, Streams and Riparian Ecosystems
- Freshwater Wetlands and Upland Areas
- Lakes
- Coastal Wetlands and Upland Areas
- Estuaries and Bays
- Stormwater Treatment Areas
- Aquifers and Canals (where they directly protect fish and wildlife)

Other Water Related Needs

The Project Delivery Team must identify and quantify water made available by the project for other water-related needs. For the basins within the spatial extent of project effects, the Project Delivery Team should identify improvements to all other water-related needs. Examples of other water-related needs assumed in the Comprehensive Everglades Restoration Plan include:

- Water supply for urban, tribes, and agriculture

- Water for resource protection (i.e., deliveries to canals to prevent saltwater intrusion, aquifer recharge)

STEP 2. SELECT THE MODEL AND ASSOCIATED RESULTS TO PERFORM THE ANALYSES.

Models selected for identifying water should be consistent with models used to evaluate alternative plans, calculate benefits, develop operating criteria used in the preparation of Operating Manuals and Savings Clause analyses (see Guidance Memorandum #3). The same model simulation must be used for identification of beneficial water for the natural system and water for other water-related needs. The type of model used to identify water for the natural system and water for other water-related needs is dependent upon the expected effects of the project. For those projects that will result in system-wide effects, and system-wide quantifications are required, a regional-scale computer model, such as the South Florida Water Management Model, should be used. However, if the project area is not covered by a regional-scale model, or if a project component is too small to be modeled by a regional scale model, or is hydrologically separate from the regional water management system, sub-regional models can be used. Site-specific computer models should be considered for site-specific quantification of beneficial water for the natural system and water for other water-related needs.

It is also important to identify potential regional system effects from projects that fall outside the domain of the current system-wide hydrologic model or projects that use only local project-scale models. If the project-scale modeling predicts changes to hydrology components used as boundary conditions in the system-wide model (inflows, outflow or stages), the system-wide model should be applied with the updated boundary conditions to determine the upstream or downstream effects on the water management system and natural areas. Examples include: a project in the Kissimmee Chain of Lakes area outside of the boundary of the system-wide hydrologic model that increases or decreases beneficial inflows to Lake Okeechobee, or a project in the Caloosahatchee Basin that reduces the amount of outflow that can be sent from Lake Okeechobee to the Caloosahatchee River. These changes in Lake Okeechobee flows should be analyzed with the system-wide model to determine potential system-wide effects.

The identification of beneficial water for the natural system and water for other water-related needs of the South Florida region involves analyzing hydrologic data. Typically, hydrologic data (e.g., rainfall, surface and groundwater elevations, flow, etc.) are used in a hydrologic model to simulate the project's hydrologic, hydraulic, environmental and economic effects. Other statistical tools may also be used to evaluate project effects.

Selected models should meet the following criteria:

- Models should be consistent with models used to evaluate alternative plans, calculate benefits, develop operating criteria used in the preparation of Operating Manuals and the Savings Clause analyses (Guidance Memorandum #3).

- Utilize time steps that permit the evaluation of timing associated with water that is identified for the natural system or made available for other uses.

- Affirm the State and Federal assurance requirements pertaining to existing legal sources, level of service for flood protection, and existing legal users.

- The time series of data (beginning with the date of the first data point through the date of the last data point) that comprises the full range of known conditions constitutes the period-of-record for undertaking this analysis. The longest historic period available (currently 36 years) of daily simulated values are recommended for the analysis. If a shorter period is used, the full range of hydrologic conditions must be represented including inter- and intra- annual variations due to droughts, periods of high and low water levels and natural fluctuations. An appropriate period-of-record will include natural fluctuations in rainfall and water levels, including droughts and periods of high water levels. Uncertainty about the adequacy of the data for compiling an appropriate period-of-record should be reflected in project documents. All simulations considered should use the same period of climatic record.

STEP 3: IDENTIFICATION OF WATER FOR THE NATURAL SYSTEM

INTRODUCTION

The primary objective in the identification of the appropriate quantity, timing and distribution of water for the natural system is to quantify the amount of water that is beneficial for the protection of fish and wildlife, including the habitats that support fish and wildlife. This section gives guidance to the Project Delivery Team on which metrics and water budget components are likely significant and require quantification in different aquatic systems. However, aquatic systems vary widely, and each situation needs to be thoroughly investigated. It is important to note that identification of water is required for all natural areas that are affected by the project within the geographical boundary of project effect.

The Law of Conservation of Mass is the fundamental scientific principle used to identify the quantity of water that is beneficial to fish and wildlife. This concept simply states that changes in storage volume, in a defined basin, over a specific time period, are equal to the net difference between inflows and outflows. Storage volume, inflows, and outflows are typically reported in a water budget, which can be readily extracted from the regional models. Storage is typically measured by determining the depth of water in the basin over a specified time period. Inflows to a basin are measured as the sum of all surface water and structure inflows, groundwater inflows, and rainfall. Outflows to a basin are measured as the sum of surface water and structure outflows, groundwater outflows, levee seepage, and evapotranspiration. Surface water flow would include overland, culvert, and structural flow into or out of the area. Ground water flow would include aquifer flow and levee seepage into or out of the area. Sheetflow is important because it is closely linked to chemical and physical processes within marshes. Since surface water flow targets do not yet exist for most

natural areas, structural flows to maintain stage targets can serve as a substitute. Since small changes in stage or water depth represent large volumetric changes in the water budget, to the extent practical all elements of flow should identified and quantified, preferably on an individual basis.

The procedure to be used depends on the anticipated project effects (e.g., changes in stage, changes in flow, etc.) and the type of area/region or water body to be restored. For instance, estuaries and rivers are considered flow driven systems, whereas isolated wetlands and lakes can be considered stage/volume-driven systems. Typically, stormwater treatment areas depend on a minimum depth or stage of water needed to sustain water quality improvement functions. Other areas, such as Everglades Ridge and Slough or Everglades Marl Prairies can be considered as both flow and stage/volume driven systems. Regardless of which method is used to identify water for the natural system, volume-probability curves and metrics that describe the ecological and hydrological performance of the plan are also required. Water budgets should be included for all types of natural system quantifications.

The following sections provide a generic discussion of which components of the water budget are important for various types of natural systems. It is important to note that the volume of water quantified for each component of the water budget should only include the portion that is beneficial to the natural system.

Water Conservation Areas – The water conservation areas have managed upstream and downstream boundaries. Inflows and outflows exist primarily through managed structural features and groundwater flows. Volume-probability curves based on change in storage based on stage should be included in the quantification of water for the conservation areas. Since the natural functions within the areas depend both on water depth and on flow (water depth determines the vegetative communities and flow facilitates an exchange of water chemistry throughout the system preventing any one area from stagnation), and since small changes in stage represent large volumetric changes to the water budget, flow components should be included in the quantification. If targets are available, volume-probability curves based on sheetflow should be part of the quantification of water. Otherwise, volume-probability curves based on inflows and outflows (groundwater seepage and structural flows) to maintain stage targets should be used to quantify water for the natural system. As with other kinds of natural systems, rainfall, evapotranspiration, and groundwater inflows and outflows are important to the overall hydrologic conditions within the water conservation areas. When canals adjacent to the conservation areas are used to maintain wetland stages or when the seepage out of the system is important, characterizing canal stages and flow across seepage transects may also be necessary.

Rivers, Streams, and Riparian Areas – In water budget terms, rivers and streams typically have very little storage relative to the inflow and outflow volumes. Therefore, quantification of surface water inflow and outflow is essential in riverine systems, while calculating storage is likely not as important. At a minimum, volume-probability curves for these natural systems should be quantified based on surface water flow. The groundwater components, however, could vary in importance from system to system. It could, for example, be critical

in supporting riparian ecosystems, or the component could be negligible because of low permeability soils in the riverbed.

Freshwater Wetlands and Uplands – Wetlands and uplands are described similarly to the water conservation areas, except that in the context of these guidance memoranda they might be much smaller in terms of aerial extent and may or may not be bounded by water management features. In some cases these areas are pockets within another land use such as agricultural lands or urban developments. County and State parks, and other lands managed for conservation may fall in this category. In general, volume-probability curves based on stage targets for both the change in storage and the inflows and outflows are needed. Since the relative importance of the water budget components may vary from system to system, the Project Delivery Team should use their best professional judgment to determine the type of volume-probability curve that is appropriate on a case-by-case basis. Since many of these areas are directly affected by water levels in adjacent canals, characterizing canal stages may also be necessary.

Lakes – From the perspective of natural resources, lakes have important aquatic and riparian resources. Because of this, stage is generally the most important variable in describing the conditions of a lake. Volume-probability curves based on stage are the primary method of quantification for lakes. However, when structural inflows and outflows necessary to maintain target stages are also important, volume-probability curves based on flow should be employed.

Coastal Wetlands and Upland Areas – These areas have similar characteristics to the freshwater wetlands and uplands described above. However, because of their proximity to the salt-water bodies near the coast, the hydrologic mixing that occurs within them is a defining hydrologic characteristic. In addition, due to their relatively low elevation, water level or stage is driven by sea level making flow through the area the more sensitive parameter to water management.

Estuarine/Coastal Areas - Because it is difficult, and in most cases, impossible, to change water levels in estuaries, quantification of change in storage may not be necessary. Attention should focus on freshwater inflows, either groundwater or surface water, or both. Volume-probability curves based on inflows should be the primary method of quantification for estuarine natural areas. These flow volumes can be based on many different types of flow (e.g., structural flow, overland flow and groundwater flow) transects depending on which ones are important to the water budget of the natural area.

Stormwater Treatment Areas – These natural areas have specific functions, which must be supported by the hydrologic conditions. Since these areas generally depend on a minimum water level necessary to maintain the water quality features of the STA. Volume-probability curves based on stage should be the primary quantification method.

Aquifers and Canals – The identification of water for these categories of water bodies may be necessary when they directly support fish and wildlife. Aquifers are generally described

by water level, while canals support fish and wildlife by providing a certain flow and / or depth. Volume-probability curves based on stage or flow are appropriate for canals.

PROCEDURES

The sections above provide guidance to the Project Delivery Team to assist them in selecting the natural areas within the extent of project effects that required analysis. For each of these natural areas, required volume-probability curves and metrics are listed in the following paragraphs and further discussed in Step 5.

This section provides detailed methodologies for calculating volume-probability curves for identifying beneficial water for the natural system and water for other water-related needs. The Project Delivery Team should use their best professional judgment to determine which metrics should be included in the analysis. At a minimum, water budgets and metrics characterizing ecological benefits should be included. For each natural area basin, a water budget calculation based on the Conservation of Mass should be performed using all of the cells in that basin. The water budget quantification should include all of the components of the hydrological cycle including: surface and groundwater inflows, outflows, rainfall, and evapotranspiration.

The Conservation of Mass principle states that the difference between the inflow and outflow volumes is equal to the change in storage in the basin:

$$\Delta S_j = \left(\sum_i Q_{i,j}^{in} - \sum_k Q_{k,j}^{out} \right) \Delta t \qquad \text{(Equation 4.D.1)}$$

where ΔS_j is the change in storage in the basin at time period j, $Q_{i,j}^{in}$ is the inflow at location *i* and time period *j*, and $Q_{k,j}^{out}$ is the outflow at location *k* and time period *j,* where *i* and *k* are indexed to account for all of the inflow and outflow locations respectively. The portion of each of the above terms that is beneficial will be quantified.

Depending upon the specific natural area, the importance of each term will vary. However, each term in (Equation 4.D.1) should be examined to determine if it describes a characteristic of the wetland that is essential. For each natural area basin affected by the project, the following are required for the quantification of water for the natural system in the PIR:

1. Quantification of volume based on stage, water depth, and storage
2. Quantification of volume based on inflows
3. Quantification of volumes based on outflows

In addition, metrics demonstrating ecological and hydrological benefits for the natural areas affected by the project should be included. The metrics that should be used include:

- Performance measures for key monitoring locations
- Water budget maps
- Time Series for flow transects (groundwater and overland flow)
- Time series for structural flows

- Hydroperiod and hydropattern graphics/tables
- Time series of canal flow and stage
- Structural flow graphics
- Weekly depth hydrographs
- Trigger locations and criteria for rain driven operations

For each natural area, two categories of water need to be quantified for each of the three requirements described in detail later in this section:

1. Beneficial existing water
2. Beneficial water made available

The beneficial water delivered to the natural system, which is a subset of the total water, is determined by comparing the time series of volume or flow for with project against the time series of volume or flow for the target (e.g., ecologically beneficial quantity for the protection of fish and wildlife). The total beneficial water is that quantity up to the target amount and may include existing and project-produced water. The beneficial water produced by the project is determined by comparing the total beneficial water in the Initial Operating Regime to the corresponding time series for the Existing Conditions PIR Baseline (i.e., without the selected alternative plan).

Several guidelines that are applied on a context-specific basis should help clarify the process:

- Science based ecological and hydrological performance measures and associated targets for restoration should be utilized by the Project Delivery Team for the quantification of beneficial water.
- For each water basin in Figure 3-H-1 and listed in Table 3-H-1 of Guidance Memorandum #3, all components of the water budget should be quantified to assure that Conservation of Mass is satisfied across all basins in the simulation. Storage, inflow, and outflow volumes or those quantities that directly or indirectly affected by water management need be quantified for the purposes of identifying water to be made available to the natural system.
- Calculation of volumes should include both surface and subsurface storage and flows.
- In general, storage, inflow, and outflow volumes should be quantified for the purposes of identifying water to be made available to the natural system unless it is obvious that doing so has no physical or ecological importance. For example, in determining the quantity of water made available to an estuary, determining the storage and outflow volumes has no meaning; only inflow volumes need be quantified.
- When calculating storages, the summation index is taken such that the entire surface area of the basin is covered.
- When calculating inflows and outflows, both surface and subsurface flows must be considered. Inflow and outflow locations or flow lines should be determined by an examination of the basin, taking care to identify important analysis components. These locations or flows lines should be consistent from project to project. For example, the Project Delivery Team would not combine groundwater seepage to Service Area 3 and surface flow to Everglades National Park when examining WCA3; one could consider combining the groundwater and surface inflows to WCA3 from WCA2. An example where you would not

want to combine surface and groundwater flow is when you have seepage outflow next to a wellfield or managed canal.

- The Project Delivery Team should pay close attention to possible sources of errors that might lead to a biased estimate of the quantities to be made available. If the stage signals contain significant high frequency noise, the methodology may tend to significantly underestimate the quantity to be made available for the natural system. These errors at the very least should be noted, and corrected if possible.
- Beneficial water calculations should use the same time interval as the time step in the model. If smoothing of the model output is necessary, the Project Delivery Team should use a moving average of the smallest time period possible (e.g., 7 day moving average).
- When calculating the portion of water that is beneficial, targets should be used on an individual location/cell basis rather than an average target for the basin and then aggregated for the final quantification.
- If information on model uncertainty is available to the Project Delivery Team, it should be incorporated into the methods for quantifying water.
- Once the beneficial water made available for the natural system and other water-related needs is computed for every time step in the period of simulation, values should be aggregated into seasons and results summarized using probability distribution curves and Box-Whisker plots, as described later in this attachment.

The following concepts apply to all requirements in this step:

For a given time period j:

R(i,j) restoration stage target

P(i,j) "with condition" simulated stage (Initial Operating Regime)

E(i,j) existing or "without condition" simulated stage (Existing Conditions PIR Baseline)

where i represents a specific model cell, m represents the inflow locations, n represents the outflow locations,

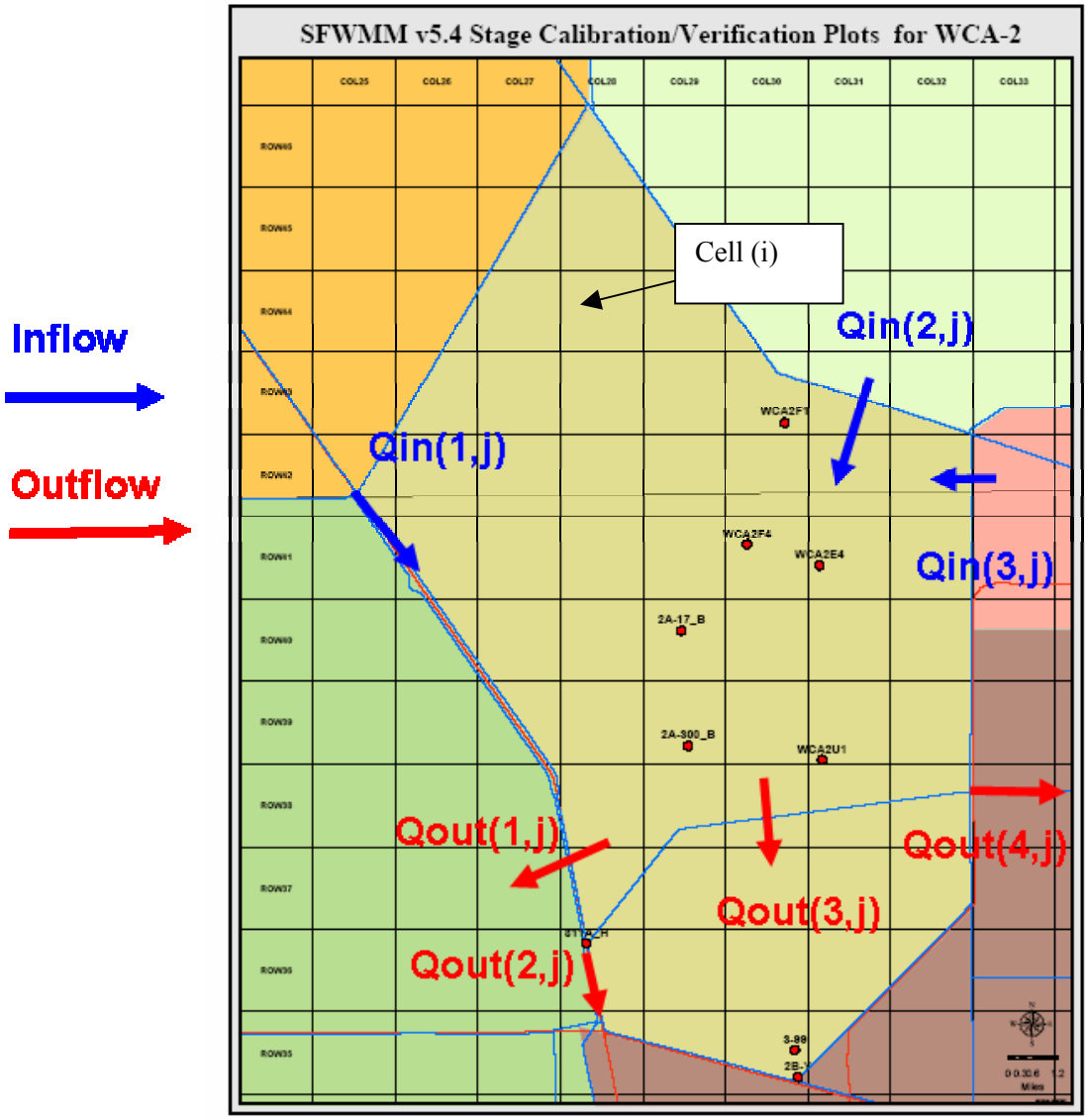


Figure 4-D-1: Concept for Stage, Inflows and Outflows

Figure 4-D-1 represents Water Conservation Area 2A and is used as an example to explain how the computation of volume-probability curves based on stage, inflows or outflows is carried out from modeling data when both stages and flows are available. For the stage method, this requires a time series of simulated stage for each cell in the basin. For the inflow and outflow method, this method requires a time series of simulated total volumetric flows (structural, surface water and groundwater) into and out of the water body under consideration, and for the appropriate time period. Note: Each Q*in* and Q*out* could represent a structural inflow or outflow or groundwater/surface water flow along a transect.

Requirement 1: Quantification of Beneficial Volume in Storage

This procedure computes beneficial volumes based on stages within a selected natural area. This procedure is applicable for the water conservation areas, STAs, and other natural areas where stage is an important component of the water budget. Basically this method is a volume computation for the entire sub-region for a given time period. The quantification should capture beneficial surface and ground water made available. Three time series of daily stage values are needed for the appropriate hydrologic period-of-record.

Quantify the Beneficial Existing Water:

- Define the "beneficial" component of the water depth or flow for the Existing Conditions PIR Baseline (without the selected alternative plan condition) as: $d^e(i,j) = \min(E(i,j), R(i,j))$

- The beneficial existing water corresponding to period j is:

$$\text{Beneficial without Project} = [\sum_{i,j} d^e(i,j)] * \Delta t$$

Quantify the Total Beneficial Water for the Natural System:

- Define the "beneficial" component of the water depth or flow for the Initial Operating Regime as: $d^p(i,j) = \min(R(i,j), P(i,j))$

- The total beneficial water for the natural system from the project corresponding to a given period j:

$$\text{Beneficial with Project} = [\sum_{i,j} d^p(i,j)] * \Delta t$$

Quantify the Beneficial Water for the Natural System Made Available:

- The beneficial water for the natural system made available by the project within the natural area:

Beneficial "With Condition" – Beneficial "Without Condition"

Once the beneficial water made available for the natural system is computed for every time step in the period of simulation, values should be aggregated into seasons and results summarized using probability distribution curves, and as necessary, Box-Whisker plots described later in this attachment. Note that the beneficial volume can be transformed also into an equivalent depth if a fixed surface area is associated with the water body being analyzed.

Requirements #2 and #3: Quantification Based on Inflow and Outflow

This procedure describes how to create volume-probability curves based on flows necessary to maintain beneficial stages. It is applicable to areas with overland flow targets or areas

where flow is used to maintain stage targets. In the case of the latter, structural flows and groundwater flows should both be considered. This approach is applicable to natural areas such as the conservation areas where inflows and outflows play a significant role in the water budget and in the ecological benefits obtained by the project. This method could also be used in managed lakes such as Lake Okeechobee to quantify volumes of water that enter or leave the lake through structural features.

Basically the method is a volume computation for the entire boundary of the basin for a given time period. While it is equally applicable if stages are for a particular cell or if they represent averages for a given area, Project Delivery Teams should attempt to calculate beneficial water on an individual cell basis. The specific purposes, goals and limitations for each project should be evaluated to determine the appropriate cells or averages of cells to use to determine the portion of structural flows that are beneficial. Additionally, the limitations of the model and locations of existing monitoring gauges should be considered in making this determination.

Compute the total volumetric inflows and outflows of the area by summing up all structural, surface water and groundwater flows into the area:

$$Vin(j) = [Qin(1, j)+Qin(2, j)+Qin(3, j)+\ldots..] \Delta t$$

$$Vout(j) = [Qout(1, j)+Qout(2, j)+Qout(3, j)+Qout(4, j)\ldots..] \Delta t$$

The following method should be used to calculate the beneficial inflows and outflows for the baseline water ($Ben_Inflows^{E}$ and $Ben_Outflows^{E)}$ and the total beneficial water for the natural system ($Ben_Inflows^{P}$ and $Ben_Outflows^{P)}$ for each time step (j). At a minimum, beneficial inflows should be quantified. The procedure below also provides steps for quantifying beneficial outflows if the Project Delivery Team determines it is necessary.

- For the case when the stage is above the target ($P(i,j) > R(i,j)$), all of the outflow from the area is considered beneficial:

  $Ben_Outflow^{E}(j) = Vout(j)$
  $Ben_Outflow^{P}(j) = Vout(j)$

- For the case when the stage is below the target ($R(i,j) < P(i,j)$), all of the flow entering the system is considered beneficial:

  $Ben_Inflow^{E}(j) = Vin(j)$
  $Ben_Inflow^{P}(j) = Vin(j)$

- For the case when the target is being maintained ($P(i,j) = R(i,j)$), all of the inflows and outflows are considered beneficial:

  $Ben_Inflow^{E}(j) = Vin(j)$
  $Ben_Outflow^{E}(j) = Vout(j)$

$Ben_Inflow^P(j) = Vin(j)$
$Ben_Outflow^P(j) = Vout(j)$

If flow through is beneficial to the natural system, then the following method should be employed:

- For the case when the stage is above the target ($P(i,j) > R(i,j)$), all of the outflow is beneficial but only a portion of the inflow is beneficial:

  $Ben_Outflow^E(j) = Vout(j)$
  $Ben_Inflow^E(j) = minimum(Vin(j),Vout(j))$

  $Ben_Outflow^P(j) = Vout(j)$
  $Ben_Inflow^P(j) = minimum(Vin(j),Vout(j))$

- For the case when the stage is below the target ($P(i,j) < R(i,j)$), all of the inflow is beneficial but only a portion of the outflow is beneficial:

  $Ben_Inflow^E(j) = Vin(j)$
  $Ben_Outflow^E(j) = minimum(Vin(j),Vout(j))$

  $Ben_Inflow^P(j) = Vin(j)$
  $Ben_Outflow^P(j) = minimum(Vin(j),Vout(j))$

- For the case when the target is being maintained ($P(i,j) = R(i,j)$), all of the inflows and outflows are considered beneficial:

  $Ben_Inflow^E (j) = Vin(j)$
  $Ben_Outflow^E (j) = Vout(j)$

  $Ben_Inflow^P (j) = Vin(j)$
  $Ben_Outflow^P (j) = Vout(j)$

The above methods require that the inflows and outflows are positive quantities.

The next step in the procedure is to compute the beneficial volume within the selected natural area.

Quantify the Beneficial Water for the Natural System Made Available by the Project:

The beneficial water for the natural system made available by the project within the natural area for each time period j:

Beneficial "With Condition" Inflow – Beneficial Existing Inflow

Beneficial "With Condition" Outflow – Beneficial Existing Outflow

Once the beneficial water made available for the natural system is computed for every time step in the period of simulation (j), values should be aggregated into seasons and results summarized using probability distribution curves, and as necessary, Box-Whisker plots described later in this attachment. Note that the beneficial volume can also be transformed into an equivalent depth if a fixed surface area is associated with the water body being analyzed.

STEP 4: IDENTIFICATION OF WATER FOR OTHER WATER-RELATED NEEDS

INTRODUCTION

The Project Delivery Team should identify and quantify the water made available for other water-related needs based on water supply and resource protection metrics that are appropriate to meet the goals and objectives of the project. The quantity, timing, and distribution of water for other water-related needs that progresses toward or meets these metrics will be identified on a system-wide and/or project-level basis and reported in the PIR. The procedure in Requirements 1, 2, and 3 of Step 3 can also be used to quantify volumes based on flow for other water-related needs with minor modifications. For instance, restoration targets should be replaced with other appropriate metrics and targets for water supply and resource protection.

The following are required for the quantification of water for other water-related needs in the PIR:

1. Quantification of increased volume of water made available for other water-related needs

In addition, metrics demonstrating ecological and hydrological benefits for other water-related needs affected by the project should be included. The metrics shat should be used include:

- Demands met for the Lake Okeechobee Service Area, including the Everglades Agricultural Area and Lower East Coast Service Areas
- Tribal irrigation and demands or entitlement water provided
- Maintaining adequate water levels measured as duration and frequency of stages in the primary coastal canals of the C&SF project and ground water levels in the Biscayne aquifer to prevent saltwater intrusion
- Maintaining adequate groundwater and surface water levels for meeting water supply needs and resource protection
- Duration, frequency, and severity of water shortage restrictions

Lower East Coast (LEC) Service Area stage targets need to be established for a multi-objective formulation involving saltwater water intrusion, and water supply. Each objective could be isolated in the domain or could be interactive with others. It is possible to imagine the interaction for an area having control of saltwater intrusion, mitigation for wetlands and, at the same time, public water supply needs for the area.

A schematic representation of a cross section for a LEC urban area is depicted in Figure 4-D-2. A stage target is defined for each cell and can be obtained based on the following criteria:

- Maintain canals for water supply and recharge
- Maintain stage in isolated wetlands, if a target exists for a particular project
- Prevent salt water intrusion
- Maintain ground water stages around wetlands
- Maintain ground water stages in selected trigger cells (based on historical monitoring well locations)

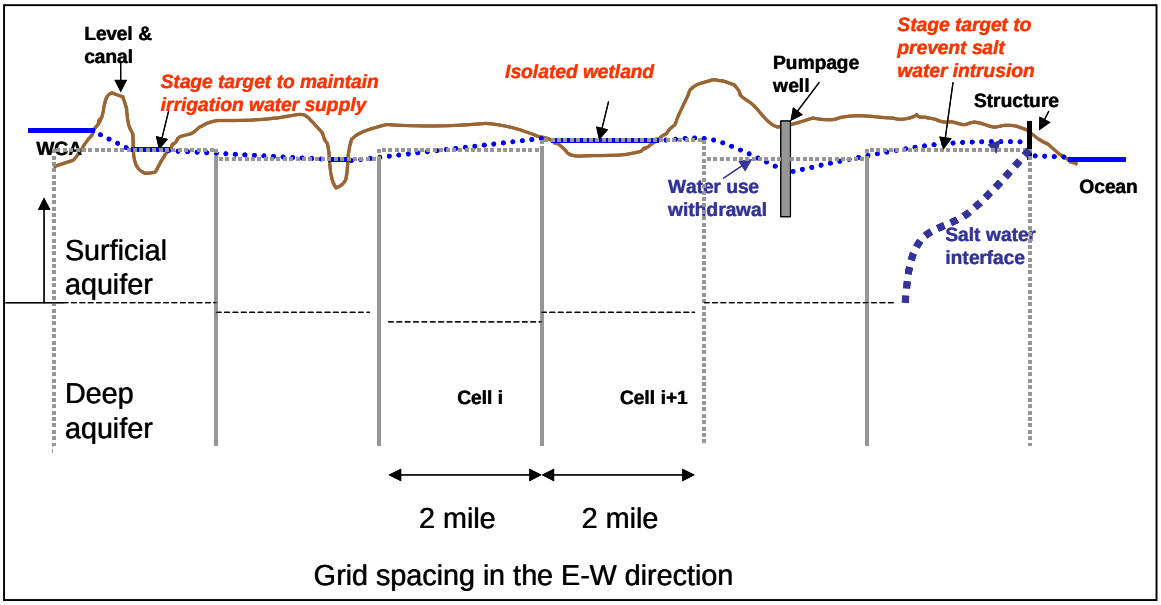


Figure 4-D-2: Definition Sketch to Illustrate Urban Targets, If Affected by the Project

The freshwater-saltwater transition zone for the Biscayne aquifer in Figure 4-D-3 is used as an example to illustrate the lines of equal chloride concentration, in parts per million, extracted from the bottom of monitoring wells (shown as black dots)

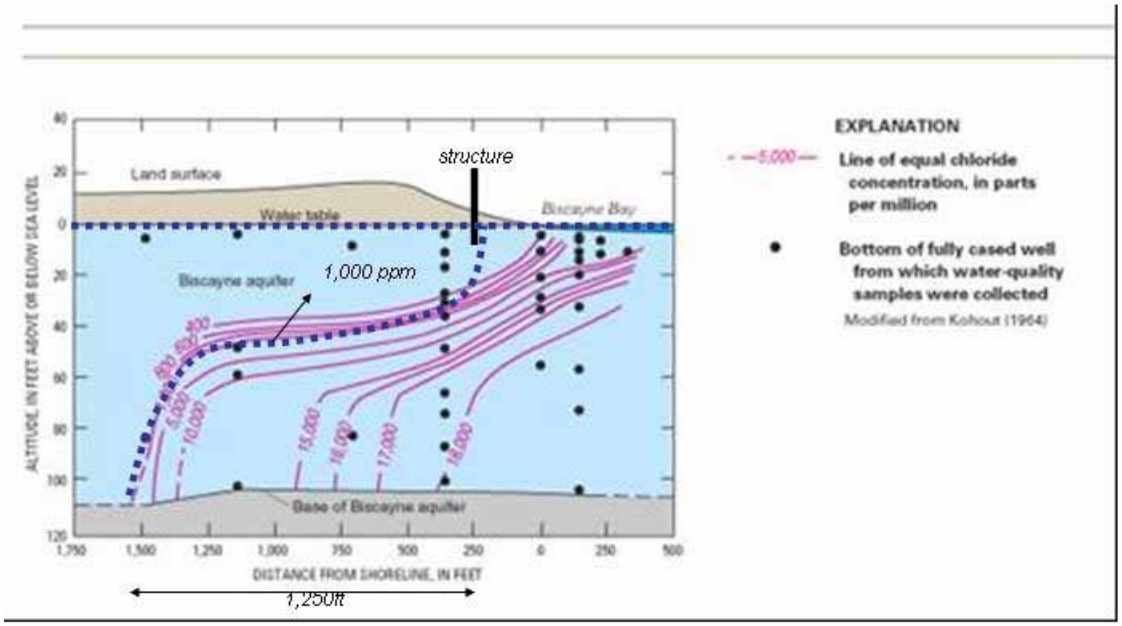


Figure 4-D-3: The freshwater-saltwater transition zone in the Biscayne aquifer

A zoom in of cell i, and cell i+1 including variables used to compute volume of water for other water-related needs is presented in Figure 4-D-4 Two different cases need to be considered. For case 1, the minimum water elevation between the target and the simulations is below ground. For case 2, the minimum water elevation is above ground.

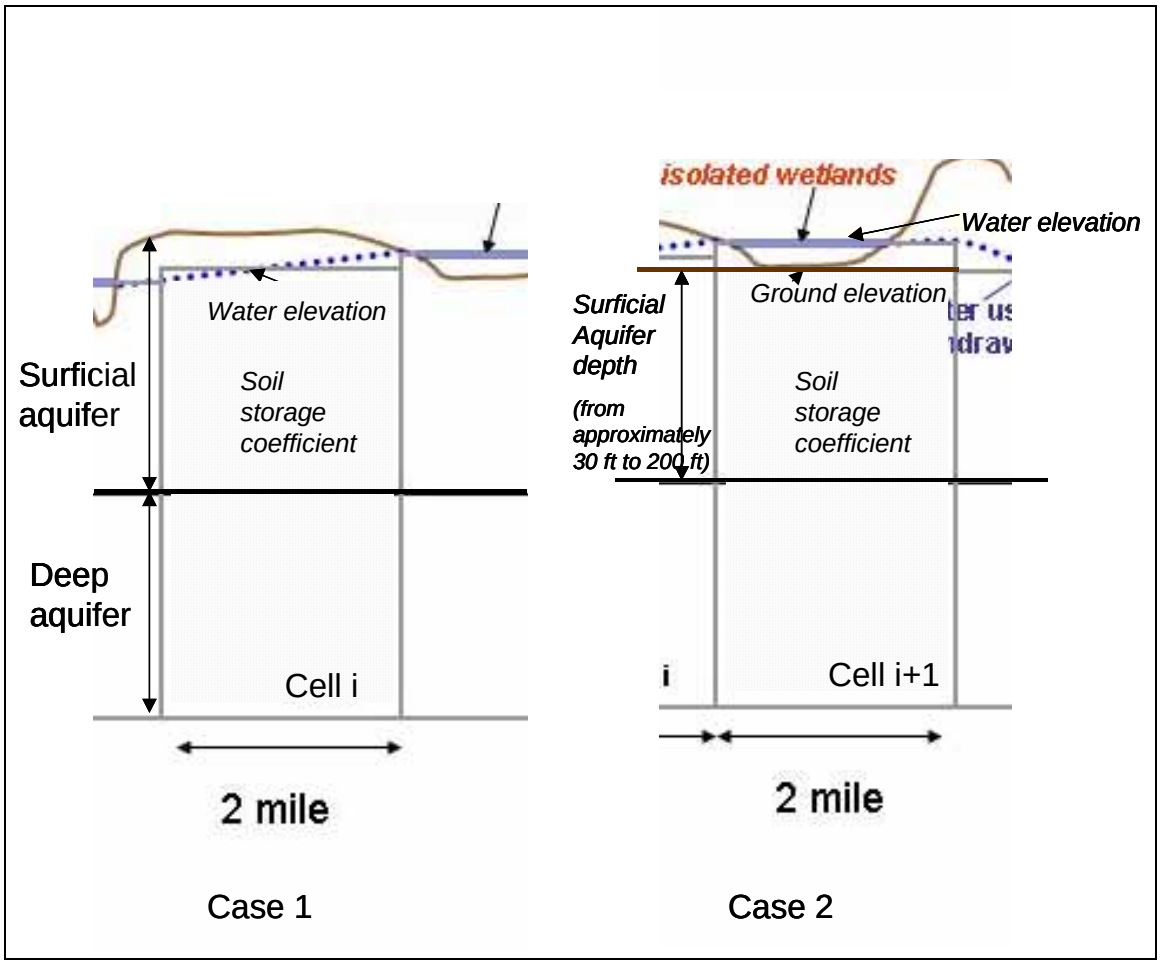


Figure 4-D-4: Zoom in of cell i, and cell i+1

PROCEDURE:

This section provides detailed methodologies for calculating water for other water-related needs. This section provides detailed methodologies for calculating water for other water-related needs. The quantity of water for other water-related needs must be quantified for both conditions, as described in Section 4.5.4.2:

- **<u>"Condition A":</u>** Compare the water made available for other water-related needs in the Initial Operating Regime to the water made available for other water-related needs in the Existing Conditions PIR Baseline
- **<u>"Condition B":</u>** Compare the water made available for other water-related needs in the Next-Added Increment Baseline to the water made available or other water-related needs in the Existing Conditions PIR Baseline

The Project Delivery Team will compare the quantity of water made available for other water-related needs at the time the project becomes operational as represented in "Condition

A," to the quantity of water made available in 2050 for other water-related needs, as represented in "Condition B." The condition which has less water available for other water-related needs will be designated the total quantity of water made available by the project. If "Condition B" is less than "Condition A," the difference in water quantities in the two conditions may be available for an identified time period to meet other water-related needs, as designated by the State.

For a given time period j and cell i:

R(i,j) represents average water elevation (ft) in cell i, during period j (e.g., day, month) for the target condition

E(i,j) represents water elevation (ft) in cell i, during period j for the "without condition" (Condition A = Existing Conditions PIR Baseline, Condition B = Existing Conditions PIR Baseline

P(i,j) represents water elevation (ft) in cell i, during period j for the "with condition" (Condition A = Initial Operating Regime, Condition B = Next Added Increment

$S^e(i,j)$ represents storage coefficient in cell i, during period j for the "without condition"

$G^e(i,j)$ represents ground elevation in cell i, during period j for the "without condition"

$A^e(i,i)$ represents aquifer depth in cell i, during period j for the "without condition"

$S^r(i,j)$ represents storage coefficient in cell i, during period j for the "with condition"

$G^r(i,j)$ represents ground elevation in cell i, during period j for the "with condition"

$A^r(i,j)$ represents aquifer depth in cell i, during period j for the "with condition"

The equivalent water depth for other water-related needs for the "without condition" is defined as:

<u>Case 1 – The minimum water elevation is below land surface.</u>

$$d^e(i,j) = \min(E(i,j), R(i,j)) * S^e(i,j) \qquad \text{only if } E(i,j) \text{ or } R(i,j) \text{ are less than } G^e(i,j)$$

<u>Case 2 – The minimum water elevation is above land surface.</u>

$$d^e(i,j) = A^e(i,j) * S^e(i,j) + \min(E(i,j), R(i,j)) - G^e(i,j) \qquad \text{Otherwise}$$

The equivalent water for other water-related needs for the "with condition" is defined as:

<u>Case 1 – The minimum water elevation is below land surface</u>

$d^r(i,j) = \min(P(i,j), R(i,j)) * S^r(i,j)$ only if $P(i,j)$ or $R(i,j)$ are less than $G^r(i,j)$

<u>Case 2 – The minimum water elevation is above land surface.</u>

$d^r(i,j) = A^r(i,j) * S^r(i,j) + \min(P(i,j), R(i,j)) - G^r(i,j)$ Otherwise

Volume of water for other water-related needs for the "without condition" (water made available (WMA) existing) corresponding to a given period j is:

$$\text{WMA Existing} = [\sum_i d^e(i, j)] \times \text{cell size (acres)}$$

Volume of water for other water-related needs for the "with condition" (WMA selected alternative plan) corresponding to a given period j is:

$$\text{WMA Recommended Plan} = [\sum_i d^r(i, j)] \times \text{cell size (acres)}$$

The water made available by the project for each condition for a period j is the difference between the water available in the with- and without- condition:

WMA^A = WMA-selected alternative plan Condition A – WMA-existing Condition A)

WMA^B = WMA-selected alternative plan Condition B – WMA-existing Condition B)

The Project Delivery Team should then compare WMA^A to WMA^B. WMA^A represents the total water made available for other water-related needs by the project. If WMA^B is less than WMA^A, then WMA^B will be the maximum amount of water available within the quantity identified in WMA^A for water supply purposes subject to the State's regulatory program.

The Project Delivery Team should then compare the quantity of water made available for other water-related needs at the time the project becomes operational as represented in WMA^A, to the quantity of water made available in 2050 for other water-related needs, as represented in WMA^B. The condition which has less water available for other water-related needs will be designated the total quantity of water made available by the project. If WMA^B is less than WMA^A, the difference in water quantities in the two conditions may be available for an identified time period to meet other water-related needs, as designated by the State.

Once the water that is available for other water-related needs is computed for every time step in the period of simulation, values can be aggregated into seasons and results summarized using probability distribution curves, and as necessary, Box-Whisker plots described in Step

6 of this attachment. Note that the volume can also be transformed into an equivalent depth if a fixed surface area is associated with the water body being analyzed.

STEP 5: GRAPHICALLY DISPLAY THE RESULTS.

Quantification of water for the natural system and for other water-related needs should be documented in the PIR with the following graphics:

- For the natural system, time series data for the Existing Conditions PIR Baseline, Initial Operating Regime, and target
- Time series data for the Existing Conditions PIR Baseline, Next-Added Increment Baseline, and the Initial Operating Regime; and appropriate metrics for water for other water-related needs
- Volume-probability curve of beneficial water made available by the project for the natural system for volume based on stage, inflow, and outflow
- Volume-probability curve of beneficial existing water for the natural system for volume based on stage, inflow, and outflow
- Volume-probability curve of water made available for water for other water-related needs
- Performance measures to support the beneficial water made available by the project for the natural system and water for other water-related needs
- Other metrics that the Project Delivery Team deems necessary

The quantification of beneficial water made available for the natural system and water for other water-related needs, whether reported as flow volume, change in storage, or water level, should be documented through the use of a probability curve. This graphic depicts the effects of project implementation under a range of climatic conditions. The probability curve indicates the probability (percentage of time equaled or exceeded, x-axis) that a certain or higher quantity of water (expressed as flow, volume, stage, or depth, y-axis) is made available by the project. It is produced by sorting quantities associated with different water years or different time-windows or seasons. In all cases, volume-probability curves should be displayed for areas affected by the project. It is common to express the percentage time equaled or exceed (x-axis) also as a recurrence interval (i.e., an event that is exceeded 50% of the time has a recurrence interval of 1-in-2 years).

For the natural system, the time series data and volume-probability curves should be provided for each type of quantification method required (e.g., change in storage, volume based on flow, volume based on stage). Since volume-probability curves rank the quantities in numerical order, timing is not preserved. In order to document the timing of the water made available, the PIR should also include graphics of the time series data used to determine which portion of water is beneficial. These graphics should include traces for the "with condition," "without condition," and the target.

The building of probability distribution curves requires the consideration of three separate time periods, as follows:

1. Modeling time step, which is daily in the case of the SFWMM
2. Time interval for computing the beneficial water for the natural system, and water for other water-related needs time series
3. Time windows (or seasons) for which the above time series will be summarized in the form of probability curves.

The longest historic period of hydrologic record available for the three time series noted above, (total, beneficial, and other water-related needs) should be partitioned into water years. Water years are divided into dry and wet season, and each season may be divided into an early and late portion. Table 4-D-2 depicts the general definition range of these windows in days:

Table 4-D-2: General Definition Range of Time Windows for Building Probability Distribution Curves.

Time window or season	Start	End
Water Year (*)	November 1	October 31, next year
Dry Season (*)	November 1	May 31, next year
Wet Season	June 1	October 31
Early Dry Season (*)	November 1	February 14, next year
Late Dry Season	February 15	May 31
Early Wet Season	June 1	August 15
Late Wet Season	August 16	October 31

(*) These windows overlap two consecutive calendar years

At a minimum, volume-probability curves should be built for the dry season, wet season, and water year time windows. Additional time windows may be necessary to demonstrate project effects. For each model used for the computation of beneficial water for the natural system, the Project Delivery Team needs to determine the best compromise between the modeling time step, the time interval for which the (total, beneficial and other water-related needs) time series are computed and the windows defined above. For instance, the SFWMM simulates and produces output at a daily time step and time series for determining the total water made available, the beneficial water to be managed for the natural system and water for other water-related needs. If the project area is not simulated in the SFWMM, the most appropriate time series should be used to compute the three time series.

The time windows or season used to summarize results in the case of the SFWMM are defined in Table 4-D-3.

Table 4-D-3: Definition of time windows for building probability distribution curves from weekly model output.

Time window or season	Start	Number of weeks
Water Year (*)	November 1	52
Dry Season (*)	November 1	30
Wet Season	June 1	22
Early Dry Season (*)	November 1	15
Late Dry Season	February 14	15
Early Wet Season	June 1	11
Late Wet Season	August 15	11

(*) These windows overlap two consecutive calendar years

Once the time series of the beneficial water made available for the natural system, the beneficial existing water for the natural system, and the water made available for other water-related needs are defined, the steps to be followed to produce the volume-probability distribution curves are outlined in the following paragraphs. For ease of presentation, this outline assumes that output from the SFWMM (daily time interval) is being used to produce the probability curve for the for the natural system volume for the dry season:

Compute mean daily volumes for each one of the 35 dry season windows in the 1965-2000 period-of-record for the SFWMM simulations. ***Note***: Season windows that do not overlap two calendar years will produce 36 values. However, only 35 values are considered to keep consistency among all time series.

- Sort the resulting set (35 values) from highest to lowest.

- Estimate the probability of each value being equaled or exceeded using the following formula, where i is the rank, v is the volume value, and n is the sample size (35 in this case):

  $$P(i) = P(\text{exceeding or equaling } v(i)) = (i - b)/(n+1-2b)$$

  According to Cunnane (1978), this formula with b=0.4 provides the best estimate of the probability when the "true" distribution from which the sample is generated is unknown. Note that for i=1, i.e. the largest value in the sample, the above formula produces a small probability of being exceeded. However, for the smallest value (i=n or i=35 in the SFWMM case), the probability of that value being exceeded is close to one.

- Plot the P(i) and corresponding v(i) values. This produces the volume-probability curves.

- In most of the cases, for a given time series, several scenarios need to be presented in each graph for comparison purposes, such as the natural system or restoration target,

the Pre-CERP Baseline, Existing Conditions PIR Baseline, or Initial Operating Regime. Additionally, three time series need to be summarized (i.e., existing beneficial water for the natural system, beneficial water for the natural system made available by the project, and water for other water-related needs made available by the project).

- If a fixed surface area (i.e., acres) can be associated to the water body under analysis, the mean daily volumes can be converted into mean daily depth and vice versa. Both axes should be presented in the ordinates of the probability distribution curve plot, with volume on the left and depth on the right. In some cases, results displayed as depths rather than volumes may be easier to comprehend. The recurrence interval or return period can be added also to the graphs by using the basic definition that returns period equals the inverse of the exceedance probability. The same definition is used to produce the lines joining values with the same return period.

Figure 4-D-5 illustrates an example of a probability distribution curve.

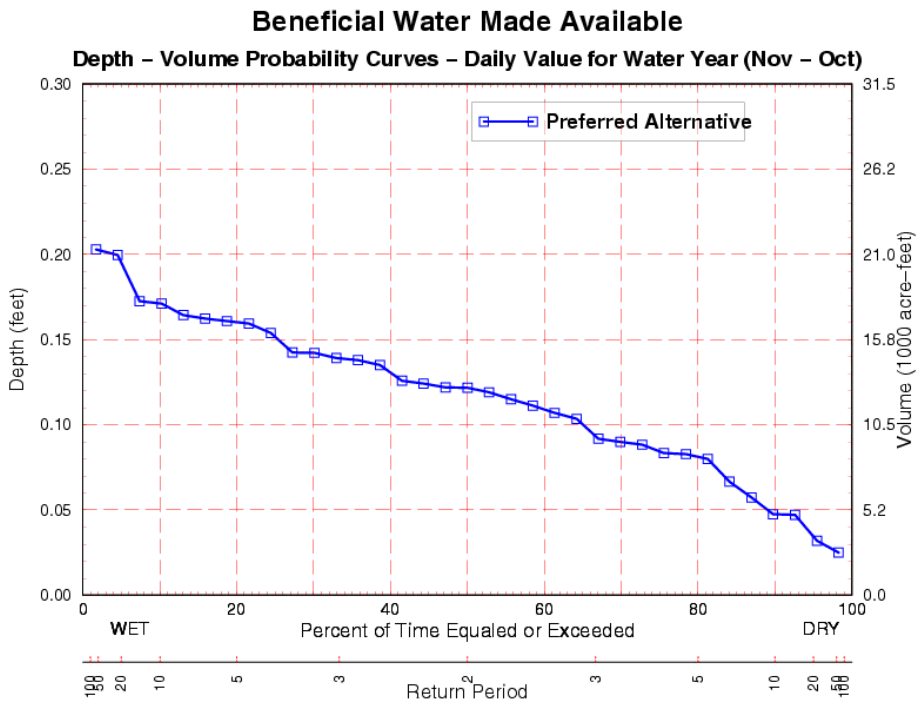


Figure 4-D-5: Probability Distribution Curve

Thirty-six years of climatic data should be simulated; if a model is selected that utilizes a shorter period-of-record, it must include sufficient climatological variability (i.e., droughts,

periods of high and low rainfall, and natural fluctuations of water) to be representative of long-term hydrologic conditions in the region.

Identifying Water Timing – As described above, identifying the water for the natural system is expressed by probability curves. The probability curves also help to analyze the timing aspect of water in the natural system. To complement the analysis, quarterly "Box-Whisker" plots may be included, an example of which is provided in Figure 4-D-6. These types of "Box and Whisker" plots show the distribution of the values for each quarterly season and how the distributions change throughout the water year. The plots are built with the same data used to derive the quarterly probability distribution curves and they are a different way to summarize the distribution. The "Box and Whisker" plots used here are defined by Helsel and Hirsch (1992) as the standard box plot and their meaning is explained with help from Figure 4-D-6. They allow the identification of outlier values. The procedure to build the "Box and Whisker" plots is as follows:

- The 50th, 25th and 75th percentiles are interpolated from the data (35 values in case of the SFWMM).
- The step is defined as one and a half times the interquartile range. The whiskers extend to the last observation within one step beyond either end of the box.
- Observations within one and two steps of the box are plotted and labeled as outside values.
- Observations farther than two steps beyond the box are plotted and labeled as far-out values.

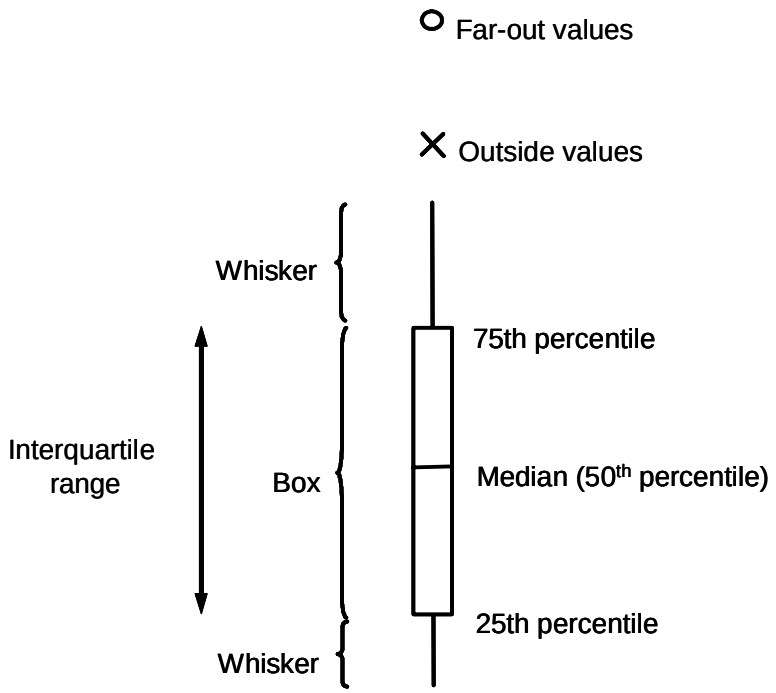


Figure 4-D-6: Standard Box and Whisker Plot

Figures 4-D-7 and 4-D-8 present a different use of the "Box and Whisker" plots. These curves are built using the same procedures, but it shows a summary of results across different simulations.

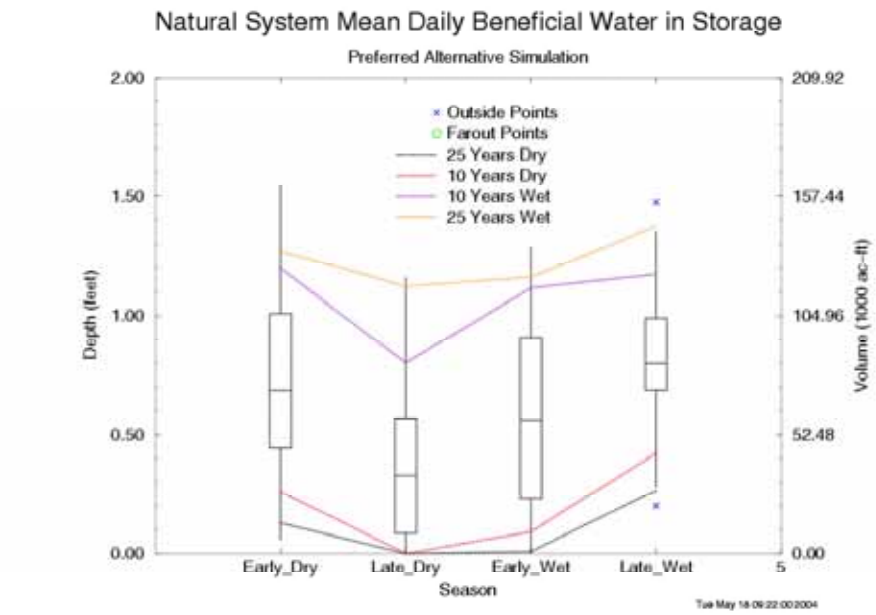


Figure 4-D-7. Example of Box and Whisker Plot

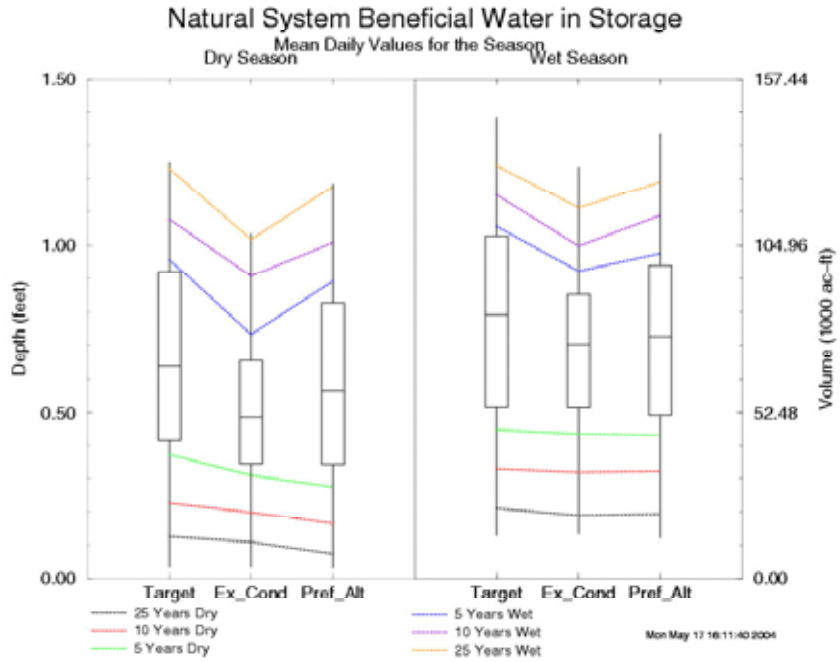


Figure 4-D-8: Example of Box and Whisker Plot

STEP 6: DOCUMENTATION

The PIR should document the results of the identification of beneficial water for the natural system and water for other water-related needs. The documentation should include the volume-probability graphics described in Step 5 as well as all metrics, water budgets and other graphics and metrics that the Project Delivery Team used to perform the identification of beneficial water for the natural system and water for other water-related needs. Additionally, the documentation should include system-wide and project level performance measures and other information deemed necessary by the Project Delivery Team.

SECTION 5: GUIDANCE MEMORANDUM #5
OPERATING MANUALS

5.1 PURPOSE

This guidance memorandum provides specific guidance for the preparation of Operating Manuals. Operating Manuals describe how CERP projects will be operated. Operating Manuals are part of the framework for assuring that the benefits of the Plan are achieved.

Section 385.28(a)(1) of the programmatic regulations requires that the USACE and the non-Federal sponsor; in consultation with the Department of the Interior, the EPA, the Department of Commerce, the Seminole Tribe of Florida, the Miccosukee Tribe of Indians of Florida, the FDEP, and other Federal, State, and local agencies; develop Operating Manuals to ensure that the goals and purposes of the Plan are achieved. The programmatic regulations also state in section 385.28(a)(6) that the Operating Manuals will do the following: comply with the National Environmental Policy Act (NEPA); describe regulation schedules, water control, and operating criteria for a project, group of projects, or the entire system; make provisions for the natural fluctuation of water made available in any given year and fluctuations necessary for the natural system as described in the Plan; be consistent with applicable water quality standards and applicable water quality permitting requirements, be consistent with the reservation or allocation of water for the natural system and the Savings Clause provisions described in the Project Implementation Report and the Project Cooperation Agreement (PCA) reflect the operational criteria used in the identification of the appropriate quantity, timing, and distribution of water dedicated and managed for the natural system; include a drought contingency plan that is consistent with the Seminole Tribe of Florida's Water Rights Compact; and include provisions authorizing temporary short term deviations.

5.2 APPLICABILITY

This guidance memorandum applies to all projects of the Comprehensive Everglades Restoration Plan. The format and major elements of Operating Manuals should be similar for all project components implemented under the Plan. However, because the Operating Manuals are focused on achieving the goals, objectives, and benefits of a specific project, their content will vary depending on the number and complexity of features in the project, as well as the complexity of interactions between the subject project, other projects within the Plan, and other existing C&SF Project features.

5.3 OPERATING MANUALS

According to the programmatic regulations, Operating Manuals will consist of a System Operating Manual (SOM) and Project Operating Manuals (POMs). The following subsections provide a brief summary of the composition of the SOM and the POMs, along

with their relationship to existing USACE water control plans and master water control manuals.

5.3.1 Project Operating Manuals

After the selected alternative plan is identified, the Initial Operating Regime will be developed. See section 4.5.4.1 of Guidance Memorandum #4 for a description of how the Initial Operating Regime will be developed. Each Project Implementation Report (PIR) developed under the Comprehensive Everglades Restoration Plan will include a draft Project Operating Manual as an annex to the PIR. As described in Section 5.5 of this guidance memorandum, the draft POM will be updated and revised for subsequent phases of project implementation, including the Construction Phase, the Operational Testing and Monitoring Phase and the Long-Term Operations and Maintenance Phase.

One main purpose of a Project Operating Manual (POM) is for day-to-day use in water resource management for essentially all foreseeable conditions affecting a project. The POM also documents how the project objectives were translated into operational rules, thereby providing guidance when unforeseen situations arise or conditions change. The POMs will include water management related regulation schedules, detailed operating instructions and operating criteria developed to meet the project purposes, goals, objectives and benefits outlined in the PIR, including the quantity, timing and distribution of water for the natural system and other water-related needs. The POMs may also contain provisions, as required, to collect, analyze and disseminate basic data related to structure operations (e.g., headwater, tailwater, and stage). The POMs will also include instructions to ensure project safety and to carry out project operations in an appropriate manner.

The USACE and the non-Federal sponsor, in consultation with other Federal, State and tribal governments, will jointly develop and approve the POMs. Within the USACE, approval authority for POMs rests with the USACE South Atlantic Division (SAD). Development of POMs will be coordinated with SAD to ensure consistency with applicable regulations. Development of the POMs will be carried out in a public process within the framework of NEPA and other applicable laws and regulations. The POMs, along with other information included in the Project Implementation Report, will provide information necessary to complete an application for water quality certification.

5.3.2 System Operating Manual

In general, the System Operating Manual (SOM) will provide a system-wide plan for operation of the projects implemented under the Comprehensive Everglades Restoration Plan, as well as for other features in the Central and Southern Florida (C&SF) Project. The Project Operating Manuals will supplement the SOM by providing the details necessary for integrating the operation of the individual project components with the system-wide operational framework described in the SOM. The System Operating Manual will include the operating criteria of all of the approved Project Operating Manuals. Each Project Operating Manual is based on the Initial Operating Regime developed for the selected alternative plan for the PIR.

The programmatic regulations state that the SOM will initially be based on the existing completed C&SF Project features and will be developed by the USACE and the South Florida Water Management District as their laws and regulations require. Existing water control plans, regulation schedules, and Master Water Control Manuals (Master WCMs) for the C&SF Project will remain in effect until approval of the SOM. The SOM will follow the procedures for preparation of water control plans, regulation schedules and Master WCMs found in applicable USACE regulations. It is envisioned that the SOM will be comprised of seven volumes. Volume 1 will provide a system-wide operational framework for projects implemented under the Plan, as well as existing C&SF Project features. Volumes 2 through 7 will be organized by geographical region and will include an appendix containing each of the POMs for that region. The geographical volumes of the SOM will be revisions of the original Master Water Control Manuals (Master WCMs) previously developed for the C&SF Project.

The POMs will be considered supplements to the System Operating Manual (SOM), and will present aspects of the projects that are not common to the system as a whole. As POMs for new projects are implemented, they will be inserted into an appendix of the appropriate geographical volume of the SOM.

5.4 GENERAL GUIDANCE FOR PREPARATION OF OPERATING MANUALS

This section provides general guidance related to development of operating manuals, particularly with regard to: 1) coordination and public review during development of the operating manuals; 2) ensuring consistency with other requirements of the programmatic regulations; and 3) providing a certain level of operational flexibility within the operating manuals to accommodate the wide range of climatic and regional conditions that are frequently encountered within the existing water management system. Attachment 5-A provides detailed guidance related to the format and content for Project Operating Manuals and Attachment 5-B provides detailed guidance related to the format and content for the System Operating Manual.

5.4.1 Coordination and Public Review

The following discussion is provided to emphasize the importance of coordination between modelers, water managers, hydraulic designers and Project Delivery Team members, as well as providing opportunities for public review and input, throughout the development of the Project Implementation Report (PIR) and the Project Operating Manuals (POMs).

5.4.1.1 Coordination Between Modelers, Water Managers, Hydraulic Designers, and the Project Delivery Team

The general procedure in the planning process is to develop several hypothetical alternative plans that are intended to meet the project goals, objectives and expected benefits. These alternative plans are then evaluated and compared against one another to select the best

alternative. This evaluation and comparison step often involves the use of hydrologic simulation models**.** One of the major factors that can affect project performance during simulation modeling is the operating criteria. In order for the planning process to result in practical and realistic project operations, it is imperative that the operating criteria used for simulation modeling are feasible in the real world, and that the simulation modeling adequately represents the project features and operations. Thus, it is important to maintain consistency in operating criteria and assumptions from the original plan formulation, through the simulation modeling process, and finally into real-world operations.

To maintain consistency throughout the operational planning process, continued coordination and communication is required between the Project Delivery Team, hydrologic simulation modelers, hydraulic designers and water managers. During the early stages of operating criteria development, the Project Delivery Team should coordinate with modelers, designers, and water managers that are familiar with current and past operations in the basin. Coordination between the Project Delivery Team and the modelers should be focused on ensuring that the modelers clearly understand the objectives of the project features and how the operations of each feature are intended to meet those objectives. With this information, the modelers will be able to conceptualize and simulate the project features in a manner that is consistent with the objectives of the project and the operating criteria. This is an extremely important consideration, as the modeling process inevitably involves the use of simplifying assumptions. While these assumptions are necessary, the modelers must be aware of the intent of project features, as well as how the model output will be used to evaluate the performance of the project features.

Communication between the Project Delivery Team and the water managers is also critical to ensure the feasibility of implementing the Project Operating Manual in the real world. There are frequently constraints on water levels and flow volumes within hydrologic basins that may affect the ability of operations to be carried out in the real world. Water managers are a knowledgeable resource for any real-world constraints that may apply to specific operations, and should be consulted throughout the development of the operating criteria and the Project Operating Manual.

The project managers must ensure that the intent and objectives of the entire project are well documented and that adequate communication regarding the intent of the operating criteria takes place between the Project Delivery Team, modelers, designers, and water managers during plan formulation. In addition, it is necessary to document how each project feature fits into meeting these objectives. Effective communication between all parties involved in planning and operating the project is the best assurance that project goals, objectives and desired benefits will be achieved in the most efficient manner possible.

5.4.1.2 Public Review Process

The public will be provided with an opportunity to review and comment on the Draft POM as part of the review process for the Project Implementation Report/Environmental Impact Statement (PIR/EIS). Public involvement activities will also be implemented to inform and

educate the public about updates and revisions to the POMs, and to allow opportunities for public review and comment whenever significant changes are made to the POMs.

5.4.2 Consistency with Guidance Memorandum #4 and Other Requirements of the Programmatic Regulations

The programmatic regulations require the development of a guidance memorandum to identify the water needed to achieve the benefits of the Plan (Guidance Memorandum #4). It is essential to maintain consistency between the identification of water and the development of the POMs at each phase of project implementation described in section 5.5 of this guidance memorandum. In addition, the programmatic regulations also specifically include several provisions requiring consistency of the Operating Manuals with other factors, including: the reservation or allocation of water made available by the State as required by WRDA 2000; Savings Clause provisions; changes made as a result of Comprehensive Everglades Restoration Plan (CERP) updates; and water quality standards and water quality permitting. The following provides a brief discussion of these requirements.

5.4.2.1 Consistency with the Identification of Water Described in Guidance Memorandum #4 and Consistency with the Reservation or Allocation of Water made by the State Pursuant to WRDA 2000

In the Project Implementation Report (PIR), the Project Delivery Team is required to identify the appropriate quantity, timing, and distribution of water for the natural system and other water-related needs following the process outlined in Guidance Memorandum #4. The Operating Manuals must be consistent with the identification of water for the natural system and other water-related needs throughout each phase of project implementation as described in section 5.5 of this guidance memorandum. The Project Operating Manual will be developed using the Initial Operating Regime, described in Guidance Memorandum #4.

The programmatic regulations have a specific requirement that the POM must be consistent with the reservation or allocation of the water made available from each Project for the natural system (see Guidance Memorandum #4 for a detailed explanation).

Both the consistency with the identification of water in Guidance Memorandum #4 and consistency with the reservation or allocation of water made available to the natural system will be accomplished through close coordination between the Project Delivery Team, modelers, and water managers during all three of the following closely related tasks in the PIR development: 1) development of operating criteria for the hydrologic simulation modeling of the selected alternative plan; 2) development of the POM; and 3) identification of water for the natural system and other water-related needs.

This coordination is graphically depicted in Figure 5-1. During the hydrologic simulation modeling of the selected alternative plan, the project operators and water managers will work with hydrologic modelers to develop operating criteria to be used in simulating operations of structural features of the selected alternative plan. The operating criteria from this model run will then be carried over and used in preparation of the POM. The hydrologic modelers will

work with project operators and water managers to ensure that the criteria and guidance in the operating manuals is a reasonable representation and captures the intent of the operating criteria used in the modeling. The output from the Initial Operating Regime model run will be used for identifying the water for the natural system. This information will then be used by the State to protect water for the natural system under State law and to reserve the water made available for the natural system as required by WRDA 2000. Maintaining consistency between these three aspects of the PIR will ensure consistency between the POM and the identification of water as described in Guidance Memorandum #4.

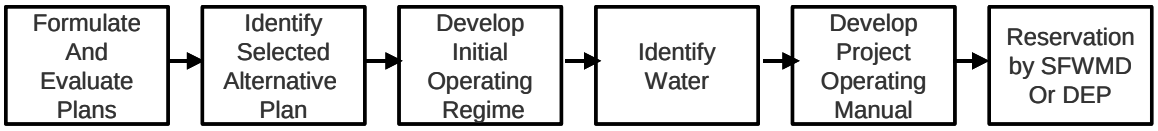


Figure 5-1: Relationship Among Assurances Elements

5.4.2.2 Savings Clause and State Assurances Provisions

The programmatic regulations also require that the POM be consistent with the Savings Clause requirements of WRDA-2000 to ensure that a new project resulting from implementation of the Plan does not: 1) eliminate or transfer existing legal sources of water until a new source of water supply of comparable quantity and quantity is available to replace the water to be lost as a result of implementing the project; 2) reduce levels of service for flood protection that are in existence on the date of enactment of WRDA-2000; or 3) have an effect on the water rights of the Seminole Tribe of Florida under the compact among the Seminole Tribe of Florida, the State of Florida and the SFWMD. This consistency will be maintained by ensuring that the operating criteria in the POM are based on the criteria used for hydrologic simulation modeling that was performed to verify conformance with Savings Clause provisions during development of the PIR.

In addition to the Savings Clause provisions, the POM must be consistent with the assurances provided in section 373.1501, F.S., for the project.

5.4.2.3 Consistency With Periodic CERP Updates

In accordance with the programmatic regulations, the USACE and the SFWMD are required to perform periodic CERP updates whenever necessary to ensure that the goals and purposes of the Plan are achieved, but not any less often than every five years. The periodic updates will provide one of the many means for determining if management actions are necessary to seek improvements in CERP based on new information resulting from changed or unforeseen circumstances, new scientific and technical information, new or updated modeling, information developed through the adaptive management and assessment principles contained in the Plan, and/or future authorized changes to the Plan. When necessary, the POMs and SOM will be revised to ensure consistency with the CERP updates.

5.4.2.4 Water Quality Standards And Water Quality Permitting Requirements

In order to meet the requirements of WRDA 2000 and the Florida Statutes, all CERP POMs must be consistent with applicable water quality standards and applicable water quality permitting requirements. Therefore, POMs should provide sufficient information to demonstrate that proposed operations will be consistent with applicable water quality standards and will meet the requirements set forth in the State water quality certificate or State-issued CERP permit. Attachment 5-C provides some guidelines and examples for information to include in the POM related to water quality certification.

5.4.3 Relationship Between Operational Flexibility and Adaptive Management

Some level of operational flexibility must be incorporated into the POM in order to accommodate the wide range of climatic and regional conditions that are frequently encountered within the existing water management system. This operational flexibility is necessary to allow water managers to better meet project goals, objectives and desired benefits of the project while still providing for flood control and other C&SF Project purposes. A simple example of operational flexibility is spillways that have a high range and a low range of headwater stages that can be used depending on field conditions. Another more extreme example of operational flexibility is illustrated by the range of allowable discharges in the Decision Trees of the Lake Okeechobee WSE regulation schedule. See Attachment 5-D.

As discussed in Guidance Memorandum #6, adaptive management is an on-going refinement process that is an integral part of the effort to provide continuous improvement of the Comprehensive Everglades Restoration Plan. Once the POM is implemented during the Long-term Operations and Maintenance phase of the project, monitoring and assessment of project performance, as well as the system-wide performance of the Plan, may reveal unforeseen problems or opportunities related to the project. These problems or opportunities for improvement may result from the individual project not meeting its expected performance or from implementation of new CERP or non-CERP activities, and will be addressed using the adaptive management protocols.

The adaptive management process may result in modifications to water management operations in the POM. If the operational modification recommended by the adaptive management process falls within the established ranges of the POM's operational flexibility, then the adaptive management recommendation may be implemented without revising the POM. However, if the adaptive management recommendation falls outside the scope of the POM, then additional analysis, formal agency coordination and public review, and/or a temporary deviation approved through the USACE South Atlantic Division (SAD) and Non-Federal sponsor would likely be required to revise or deviate from the operating criteria in the POM.

5.5 EVOLUTION OF PROJECT OPERATING MANUALS

Development of Project Operating Manuals (POM) will involve an iterative process that will continue throughout the life of the project. As illustrated by Figure 5-2, the Draft POM will be updated at specific intervals during the design, construction and operational testing and monitoring phases of the project. Refinements to the operating criteria in the Draft POM will be made as more design details, data, operational experience and information is gained during these phases. It is also anticipated that once the POM is completed and the long-term operations and maintenance phase is underway, it may be necessary to revise the POM based on additional scientific information, new CERP or non-CERP activities being implemented, new CERP updates, etc.

As updates and revisions are made to the SOM, individual revised pages will be clearly identified with the date of the latest revision. As a POM is revised, each previous iteration of the manual will be archived to provide historical continuity for project operations.

As shown by Figure 5-2, the anticipated points of update and revisions to the POM are as follows:

- Draft POM for the PIR/EIS
- Draft POM for Operations During Construction
- Draft POM for the Operational Testing and Monitoring Phase
- Completed POM
- Revisions to the POM During the Long-Term Operations and Maintenance Phase

5.5.1 Draft POM for Inclusion in the PIR/EIS

Initially, a Draft POM will be developed during the PIR Phase of the project. This draft POM will be consistent with, and part of, the NEPA documentation and will be included as an annex to the PIR. Water management operations in the Draft POM will consider operations of existing or planned projects, including both CERP and non-CERP activities, that may influence operations of the subject project. This may include projects or project features that are upstream, downstream or in the vicinity of the subject project, and operations to be used during construction.

5.5.2 Draft POM for Operations during Construction

During the Detailed Design - Plans and Specifications Phase, the Draft POM may be further developed and modified for use during construction. This updated Draft POM will focus on facilitating construction of the project components while maintaining established levels of project purposes, such as water supply, flood protection, and any required delivery of water to the natural system. Some of these POM modifications may result from value engineering analyses conducted during the Detailed Design – Plans and Specifications Phase. Defining operating criteria to be used during construction will require consideration of issues that are unique to the construction phase such as real estate issues, construction schedules, contract

sequencing, temporary by-pass canals, dewatering activities, etc. As a result, this modified Draft POM will likely contain operating criteria that are only applicable during the construction phase.

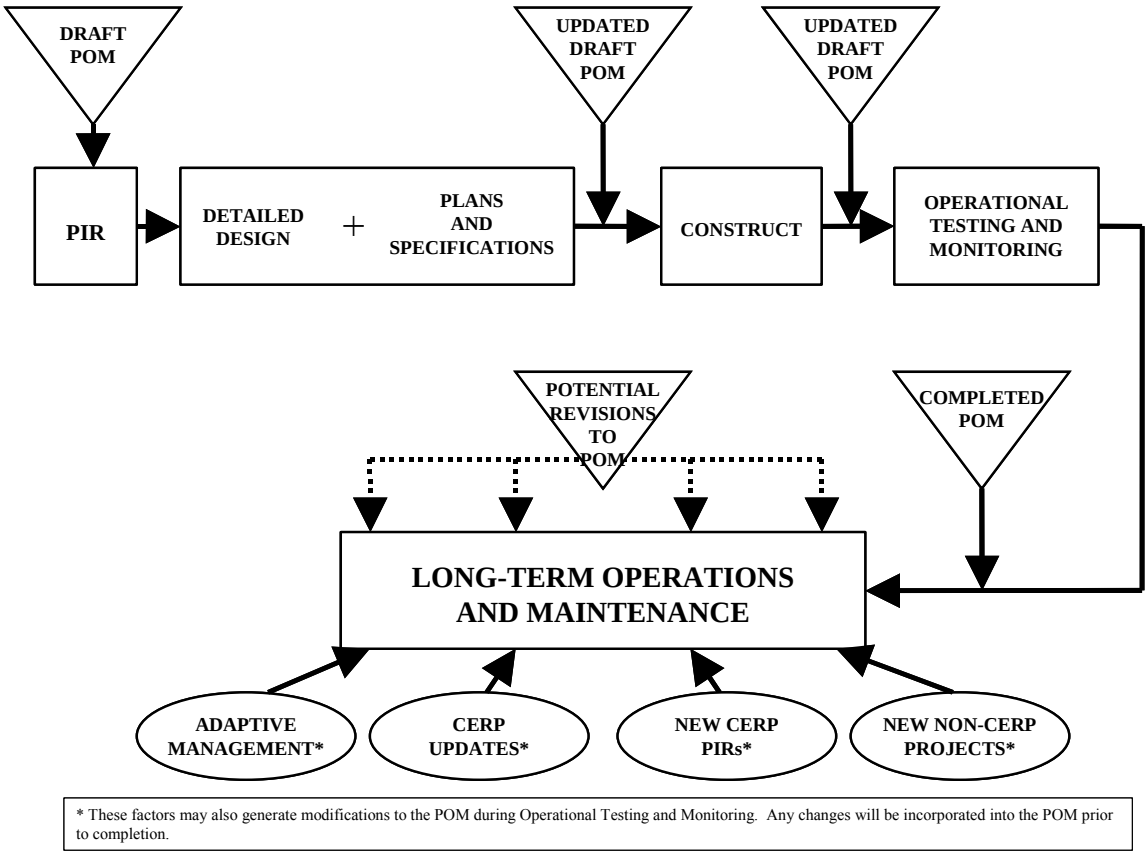


Figure 5-2 Evolution of the Project Operating Manual

5.5.3 Draft POM for Operations during the Operational Testing and Monitoring Phase

The Draft POM will be updated based on detailed design information and operational experience gained during the construction phase. This updated Draft POM will be used for operations during the Operational Testing and Monitoring Phase (OTMP), the time period between completion of physical construction and transfer of the project or project feature to the non-Federal sponsor for long-term operations and maintenance. The purpose of the OTMP is to verify that the project features perform as designed prior to transferring the project to the non-Federal sponsor. The time period for the OTMP will be defined in the Project Cooperation Agreement. This Draft POM should be prepared at least 60 days prior to completion of construction and should include operating criteria that can encompass incremental refinements that are recommended during the OTMP.

5.5.4 Completed POM

Following completion of the OTMP, the completed POM will consolidate the incremental refinements recommended during the previous phases and will describe water management regulation schedules and operating criteria for use by the non-Federal sponsor for the long-term operation of the project component. This completed POM will supercede all other iterations of the Draft POM. At this point, the non-Federal sponsor will accept ownership and responsibility for long-term operation and maintenance of the project. The Operation and Maintenance (O&M) Manual, a separate and distinct requirement from the POM that establishes the policy for the long-term maintenance of flood control and related structures, will also be completed at this time. The O&M Manual will contain pertinent information for the safe and efficient use of the physical infrastructure of the project, and maintenance of the project's structural, mechanical and electrical systems.

5.5.5 Revisions To The POM During the Long-Term Operations and Maintenance Phase

After the completed POM is approved and long-term project operations are underway, circumstances are likely to arise that will result in a desire to update or modify the POM. This may result from implementation of new CERP project components, implementation of new non-CERP activities, changes resulting from recommendations made through the adaptive management and assessment process outlined in Guidance Memorandum #6 or changes made through CERP updates. All revisions to the POM will be completed in accordance with the process outlined in the programmatic regulations and applicable USACE regulations, consistent with applicable NEPA requirements.

It is anticipated that in some cases, a new CERP Project Implementation Report and POM will result in a need to change operating criteria and/or update a completed POM for an existing project. In that circumstance, the NEPA requirements for the change to the existing POM will have been fulfilled during the NEPA coordination for the new PIR. The POM for the existing project will be revised, as necessary, and will replace the old POM. This revised POM will also replace the old version of the POM in the appropriate geographical volume of the System Operating Manual (SOM). Furthermore, if the modifications to the existing POM will influence system-wide operations, then Volume 1 of the SOM will be updated to reflect these changes, including the rationale for the modifications and a description of any interactions between project features.

5.6 DEVELOPMENT OF THE SYSTEM OPERATING MANUAL

During the development of the original USACE Master Water Control Manuals (WCMs) for the C&SF Project (Engineering Regulation 1110-2-8156 - Preparation of Water Control Manuals), the South Florida hydrologic system was divided into five interconnected geographical regions. The System Operating Manual (SOM) will replace this existing set of Master WCMs. The SOM provides an integrated system-wide framework for operating the implemented projects of CERP and the existing C&SF Project. The complete SOM will

provide explicit guidance and operating criteria for the operational interactions between the system's geographically related regions. Attachment 5-B provides more detailed information on the format and content of the System Operating Manual.

5.6.1 Composition of the System Operating Manual

The SOM will consist of seven volumes, six of which (Volumes 2 through 7) are comprised of the geographically related regions within the original C&SF Project. The overall system framework of the SOM will be contained in Volume 1, which will provide a system-wide operating plan for the implemented projects of the Plan and the C&SF Project features. Generally, Volumes 2 through 7 will retain the original format of the Master WCMs for the existing C&SF Project, with a few modifications to accommodate the Plan POMs. The format of Volume 1 will be modified to provide the framework for system-wide operations.

The information from the existing C&SF Project Master WCMs will be utilized and modified as necessary for the appropriate volumes of the SOM. A new volume, entitled "Southwest Florida", a region not covered in the original Master WCMs, will be added as Volume 7. The C&SF Project "Authorities and Responsibilities (A&R) Manual" (the original Volume 1) will be incorporated into the new Volume 1 of the SOM. The "Discretionary Changes" chapter of the A&R Manual, which describes historical modifications to the C&SF Project, will be moved to Appendix A of the new Volume 1 for reference purposes.

All approved water control plans, POMs, and/or operating criteria for C&SF Project structures will be found in the appropriate geographical volume (Volumes 2 through 7) of the SOM. Any modifications resulting from implementation of a new POM that are relevant to system-wide operations will be incorporated into the appropriate SOM volume. The existing C&SF Project structure descriptions and rating curves appendix, formerly found in Appendix A of the Master WCMs, will be located in Appendix A of Volumes 2 through 7 of the SOM. This appendix will be modified, and/or new descriptions added, as each new POM is implemented.

Each CERP POM will be inserted into Appendix B of the appropriate SOM volume as a supplement and will be referenced in the front of the SOM in a "History of Revisions" table that will be updated as each POM is completed. The table will provide the location of the POM within the SOM, the date the POM was completed, and the location of the structure descriptions and rating curves.

To summarize, the SOM will consist of the following volumes:

- Volume 1: System Operating Manual – System-wide
- Volume 2: System Operating Manual – Kissimmee River – Lake Istokpoga Basin
- Volume 3: System Operating Manual – Lake Okeechobee and Everglades Agricultural Area
- Volume 4: System Operating Manual – Water Conservation Areas, Everglades National Park, and ENP – South Dade Conveyance System
- Volume 5: System Operating Manual – East Coast Canals
- Volume 6: System Operating Manual – Upper St. Johns River Basin

- Volume 7: System Operating Manual - Southwest Florida

For clarification, Table 5-1 describes the old and new nomenclature for the 7 Volumes of the SOM.

Table 5-1: Old/New Nomenclature for the 7 Volumes of the SOM

VOLUME	OLD	NEW
1	Authorities and Responsibilities	System-wide
2	Kissimmee River – Lake Istokpoga Basin	Same
3	Lake Okeechobee and Everglades Agricultural Area	Same
4	Water Conservation Areas, Everglades National Park, and ENP-South Dade Conveyance System	Same
5	East Coast Canals	Same
6	Upper St. Johns River Basin	Same
7	None	Southwest Florida

See Figure 5-3, The Hierarchy for Compilation and Integration of Project Operating Manuals into the System Operating Manual.

SYSTEM OPERATING MANUAL
VOLUME 1 – SYSTEM-WIDE

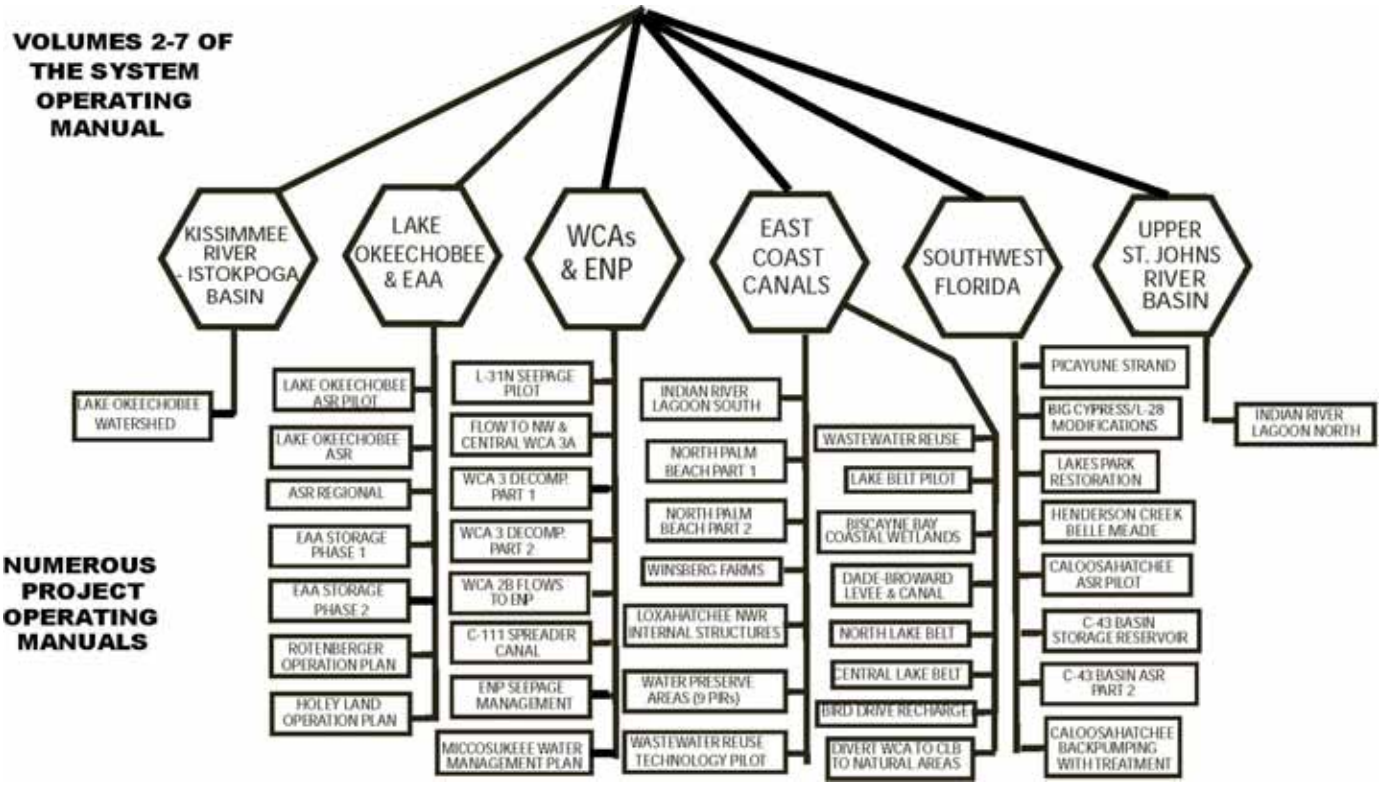


Figure 5-3: Hierarchy for Compilation and Integration of Project Operating Manuals into the System Operating Manual (Not all projects are listed.)

ATTACHMENT 5-A
FORMAT AND CONTENT OF PROJECT OPERATING MANUALS

This attachment provides guidance related to the format and content of Project Operating Manuals for "individual" Comprehensive Everglades Restoration Plan (CERP) projects. In general, the Project Operating Manual (POM) should include descriptions and operating criteria for all structures that are part of the CERP project, such as gravity structures, pump stations, diversion, or aquifer storage and recovery facilities. It should also consider and discuss foreseeable operations of other water resource projects that are hydrologically connected, but are not integrated components of the subject CERP project. The following provides more detailed instructions on format and content for the POMs.

I. FORMAT OF PROJECT OPERATING MANUALS

This section describes the general format for POMs. Some topic headings listed in this section may not be utilized in all phases of the POM. Topic headings may be included as placeholders in early Draft POMs for use in future iterations. Additionally, use of topic headings may vary depending upon the number and complexity of project features covered by the POM, as well as interactions with other C&SF Project features and other CERP features.

The "Table of Contents" in Section II and the "Guidance on Content for Project Operating Manuals" in Section III provide an easy to follow guide for preparation of POMs. These two sections should be used by the Project Delivery Team as a checklist of relevant issues/items to be addressed in the Draft POM for the Project Implementation Report.

A. General

The following items provide a summary of general formatting guidance for Project Operating Manuals:

- Manual covers will be color coded by basin.
- All completed versions of the POMs should have a spine labeled with the project name.
- Pages in the manuals should be dimensioned 8-1/2 by 11 inches and loosely bound with cover stock.
- Every page should include a page number and a date showing the most recent revision date.
- Individual revised pages will be clearly identified with the date of revision.

B. Editorial Guidance

The following guidance should be followed when developing the POM:

- Use of the term "regulation" should be restricted to either: (1) water control procedures and decisions that normally are determined by regulating engineers (hydrologic or hydraulic), or (2) legal rules, agreements, or contracts; e.g. Section 7 of Flood Control or Navigation Regulations, ER 1110-2-240, water supply contracts, and ruling of interstate compacts.

- Use of the term "operation" should be restricted to physical manipulation of spillway gates, outlet works, or instrumentation associated with projects.

- Use of the term "operator" refers to the individual who has the responsibility for the physical "operation" of the project.

- Use of the term "water manager" refers to the individual who prepares the successive phases of the POM, and participates in the development of the PIR and the translation of modeling results to real-world operating criteria.

C. Tables and Plates

- Disperse tables that are one page or less in size throughout the text. Include all tables that are over one page in the "Tables" section following the text to facilitate narrative continuity within the text. Although these tables are located separately, the table numbering system in the text should include both sets of tables – those in the Tables section and those dispersed throughout the text. Page numbering for the section on tables would be the same as numbering chapters except page numbers would be preceded by a "T." Reference to a table would read as follows," … shown in Table 1-2 (see page T1-1)", and in the List of Tables as:

Table	Page
1-1 _____	1-2
1-2 _____	T1-1
1-3 _____	1-4

- Include tables showing elevation versus area and elevation versus capacity in increments of 1 foot or less. These tables should cover elevation ranges from bottom of the lake, storage area, impoundment, etc., to maximum pool.

- Plate and table numbers should correspond to chapter numbers where first referenced. Example: Plate 1-1, 1-2, 1-3, 2-1, 2-2, etc.

- Title block on plates should be easily readable when the manual is opened, with the preferred location in the lower right-hand corner.

- Scales used on plates should be divided into units of 1, 2, 5, or multiples of 10 per inch. The scale selected should be easy to read and usable for actual operations.

II. EXAMPLE TABLE OF CONTENTS (SUBJECT TO PROJECT NEEDS)

Item	*Title*
i.	Title Page
ii.	Notice to Users of Manual
iii.	Emergency Regulation Assistance Procedures
iv.	Table of Contents
v.	Pertinent Data
1	Introduction
2	General Project Purposes, Goals, Objectives and Benefits
3	Project Features
	a. Existing Features
	b. Proposed Features
	c. Removed Features
4	Operational Strategy to Meet Project Objectives
5	Project Relationships and Interactions
6	Major Constraints
7	Standing Instructions to Project Operators
8	Operations to Meet Project Purposes
	a. Achieving Natural System Goals, Objectives and Benefits
	b. Flood Damage Reduction
	i. Normal and Emergency Operations
	ii.. Hurricane or Tropical Storm Operations
	iii. Storage Area Weir Discharge
	iv. Uncontrolled Discharge
	c. Water Quality
	d. Water Supply
	e. Recreation
	f. Fish and Wildlife
	g. Navigation
	h. Other
9	Pre-Storm/Storm Operations
10	Consistency with Water Reservations or Allocations
11	Consistency with Savings Clause and State Assurances Provisions
12	Drought Contingency Plan
13	Flood Emergency Action Plan
14	Deviation from Normal Regulation
	a. Emergencies
	b. Unplanned Minor Deviations
	c. Planned Deviations
15	Rate of Release Change
16	Seepage Control
17	Initial Reservoir/Storage/Treatment Area Filling Plan

18 Non-typical Operations for Reservoir/Storage/Treatment Area Performance
19 Aquifer Storage and Recovery System Plan
20 Water Control Data Acquisition System Plan
21 Consistency with the Adaptive Management Program and Periodic CERP Updates

NOTE: The sections below that follow the main text of the document will be preceded by individual title pages:

- Tables
- Figures
- Plates/Operational Schematics
- Exhibits:
  - Structure Descriptions and Rating Curves
  - Formal Agreements
  - Water Control Data Acquisition System Plan
  - Standing Instructions to Project Operators
  - Other (e.g. supplementary pertinent data)

III. GUIDANCE ON CONTENT FOR PROJECT OPERATING MANUALS

The content of the POMs may vary depending upon the number and complexity of project features covered by the POM, as well as interactions with other C&SF Project features and other CERP features. Most POMs will include the topic headings shown in Section II Example Table of Contents. Paragraphs may be further subdivided when necessary. For example, subdivision may be necessary to accommodate larger projects, projects with multiple features, or projects that impact or affect adjacent projects that may also require some explanation. In addition, examples of site layouts and operational schematics can be found in Attachment 5-D.

The following provides guidance regarding the content for each of the paragraphs shown in Section II Example Table of Contents.

i. Title Page

ii. Notice to Users of Manual

iii. Emergency Regulation Assistance Procedures

iv. Table of Contents

v. Pertinent Data The pertinent data included in this paragraph should be limited to approximately one page. If necessary, additional information relating to water management

may be tabulated in an exhibit following the main text of the document. Restrict information included here as follows:

- Location (state, county, river/canal, and river/canal mile).

- Drainage area upstream of the project and the uncontrolled areas above any major control points downstream.

- Site layout and schematic of project features. Examples of operational schematics and figures are located in Attachment 5-D.

- Type, length, height, crest elevation, top width of dam, dikes, and tidal barriers; type and size of all discharge facilities; spillway, pump stations, outlet works, water supply pipes, and navigation locks.

- Real estate guide taking lines by fee and easement. (Optional for Draft POM.)

- Pertinent elevations with corresponding reservoir/storage area surface areas, incremental and cumulative storage and discharge capacities of spillway and outlet works for maximum pool, top induced surcharge, top flood control pool, top conservation pool, top inactive pool, invert lowest intake, and streambed/canal bottom. Also indicate the volumes of sediment reserve, dead storage, and the range of any seasonal joint use, when applicable.

1. **Introduction.** This paragraph should include a very brief introduction to the POM which may include, but is not limited to, the following:
   - A statement that the main purpose of this project operating manual is for day-to-day use in water management for essentially all foreseeable conditions affecting the [INCLUDE PROJECT OR PROJECT FEATURE NAME OR DESCRIPTION].
   - A statement identifying project phase that this POM will cover (e.g., PIR/EIS Phase, Construction Phase, Operational Testing and Monitoring Phase, Long-Term Operations and Maintenance Phase).
   - A statement that there is a possibility that modifications and/or revisions to the POM may occur during the remaining project phases.

2. **General Project Purposes, Goals, Objectives and Benefits.** This paragraph should include a summary of the project purposes, goals, objectives and benefits described in the PIR. It should describe, in general terms, how the Draft POM is designed to meet project purposes as stated in the PIR. It should include a statement that the project will be operated in accordance with the POM to achieve the goals, purposes and benefits outlined in the PIR, including the quantity, timing and distribution of water for the natural system and other water-related needs identified through the process outlined in Guidance Memorandum #4.

3. <u>Project Features</u>.

b) **<u>Existing Features</u>.** Provide a brief description of existing project features by basin, including water control structures, reservoirs, canals, stormwater treatment areas, etc., and a brief description of each feature's purpose and role in meeting the project purposes and achieving project benefits.

c) **<u>Proposed Features</u>**. Provide a brief description of the proposed features of the selected plan including location, water control structures, reservoirs, canals, stormwater treatment areas, etc., with a brief description of each feature's function in meeting the project purposes and achieving project benefits.

d) **<u>Removed Features</u>.** Describe any existing project features that will be or have been removed or altered due to the new project, along with a brief explanation of the reason that the operational function of this feature is no longer needed and/or how this operational function will be provided by another project feature or operational change, if applicable.

4. <u>Operational Strategy to Meet Project Objectives</u>. In general terms, briefly describe existing and proposed regulations and/or operational strategies of project features to meet the goals, objectives and benefits in Paragraph 2 - General Project Purposes, Goals, Objectives and Benefits, which include restoration, preservation, and protection of the South Florida ecosystem, while providing for the other water-related needs of the region such as flood control, water supply and other objectives. Include project component interaction with other project components from a system-wide perspective. Briefly explain how the project component would be operated to meet the quantity, timing and distribution of water for the natural system and other water-related needs identified through the process outlined in Guidance Memorandum #4. Provide a brief explanation of the relationship of the Draft POM to the project's phases as outlined in the PIR, the implementation schedules for projects currently underway but not yet completed, and implementation schedules for future CERP projects that may influence operations of the subject project component. If necessary, include a summary of the modeler's intent in the development of the hydrologic simulation model relative to the project's water management operations and fulfillment of the project purposes, goals, objectives and benefits.

5. <u>Project Relationships and Interactions</u>. As new CERP and non-CERP activities are implemented, POMs for existing C&SF or CERP project features may need to be modified or revised. This paragraph should describe how the new project features and/or operating criteria change, impact, link or interact with the existing features. If this new POM results in operational modifications to other existing CERP or C&SF Project features, the POMs for the existing project features will be revised and the revised POMs will supercede the previous version of the POMs.

6. <u>Major Constraints</u>. Identify constraints related to the movement, storage, and/or utilization of the water resource. List and explain constraints imposed by existing projects, anticipated constraints from project components currently underway but not yet completed,

and anticipated constraints from future CERP projects. Describe physical constraints including unremediated malfunctions; gate change limitations; structural and hydraulic design limitations; discharge constraints associated with inoperative gates; low pool level; aquifer storage and recovery system intake and water supply; outlet limitations; reservoir/storage area limitations associated with high pool levels such as backwater into upstream structures, water quality concerns during initial filling and refilling of storage/treatment areas, leaks in levees, embankment boils, and required movement of facilities. This paragraph should also identify any potential legal, political and social conflicts with project operations, as well as any major conflicts between purposes that could influence operations.

7. <u>Standing Instructions to Project Operators</u>. Reference exhibit in back of manual -- during normal conditions, during communication outage, unforeseen emergency events requiring deviations from prevailing regulation schedules, spillway/outlet works restrictions.

8. <u>Operations to Meet Project Purposes</u>.

a.) **<u>Achieving Natural System Goals, Objectives, and Benefits</u>.** State the primary ecological objectives for the project features as outlined in the PIR, with a description of operational criteria that are designed to meet those primary ecological objectives. Operating criteria for the natural system must be designed to achieve the environmental performance and benefits described in the Plan. Water deliveries should be consistent with water reservations and where applicable, should include environmental operations such as marsh-driven, estuarine salinity targets, or rain-driven operations. Environmental operations such as marsh-driven, estuarine salinity targets, or rain-driven operational rules should include descriptions concerning operational intent and how operational rules were designed to meet desired objectives. Included should be a detailed description of the hydrologic targets, the predictive tools used to estimate the targets, and discussions of operational latitude allowable in meeting the targets. The operational rules should also include descriptions of sensitive environmental resources affected by operations for other purposes, and recommendations on operational strategies to help protect those resources.

b) **<u>Flood Damage Reduction</u>.**

i) <u>Normal and Emergency Operations</u>. Describe any flood damage reduction operating criteria for project phases that require flood damage reduction operations, including rule curves, triggers, water surface elevations, and minimum flows. Include normal and emergency regulations. This discussion should briefly address the following: an explanation of existing and proposed operating criteria; release scheduling procedures during flood emergency; computer applications; role of the USACE; relative emphasis upon controlling peak outflow or pool level and backwater; use of seasonal or joint use storage; regulation with respect to storage zones including surcharge; use of streamflow predictions; forecasting total flow downstream; reference to exhibits (SDF, SPF, maximum flood of record,

other); special concerns for safety. This paragraph should also reference a release schedule or water management diagram (this should be a table or plate, see EM 1110-2-3600). This paragraph should also provide transitional operations, as necessary, for existing features as they are affected by new features coming on-line. If necessary, include explanation of modeler's intent in development of the hydrologic model relative to flood damage reduction, the project area, and areas of concern adjacent to the project area.

ii) **Hurricane or Tropical Storm Operations.** State the agency/organization that is responsible for operations at project water management structures prior to, during, and after a hurricane or tropical storm. Provide a detailed explanation of operating criteria to be followed before and during hurricanes or tropical storms, if different from typical operating criteria. Include a procedure for using weather forecasting and National Weather Service broadcasts to determine the timing for implementation of hurricane or tropical storm procedures. Reference the Emergency Action Plan for the project, including the State procedure for interrupted communications, and the procedure for informing local emergency management offices, if necessary.

iii) **Storage Area Weir Discharge.** Provide a general listing of conditions that may cause reservoir/storage area emergency overflow weir discharge. Include a detailed explanation of operating criteria to be followed at project features when weir discharge is occurring due to exceedance of storage capacity at reservoir/storage area.

iv) **Uncontrolled Discharge.** Provide a brief description and design capacity for structures designed for uncontrolled discharge, including emergency overflow spillways and uncontrolled weirs and culverts.

c) **Water Quality.** Although water quality improvement may not always be an authorized project purpose, compliance with Public Law 92-500 requires that all Federal facilities be managed, operated, and maintained to protect and enhance the quality of water and land resources through conformance with applicable Federal, State, Interstate, and local substantive standards. This paragraph should include information on specific operating criteria that are to be used continuously or periodically to ensure project compliance with applicable Federal/State water quality standards. It should also identify any special operational criteria that may be employed to alleviate or respond to emergency conditions, such as fish kills, flow augmentation for pollution abatement or aesthetics. Planning Division staff, in conjunction with Water Managers, should coordinate as necessary with FDEP and other appropriate agencies to ensure that the project will comply with applicable water quality standards or CERP permits during all phases of the project, including unique water quality concerns during the construction phase.

d) **Water Supply Operations.** Describe operating criteria to be used to provide releases to a canal or stream or withdrawal from a reservoir or storage area for municipal/industrial/irrigation usage and/or resource protection; reference contract(s),

low flow requirements, fish and wildlife, water rights, roles of the USACE and the non-Federal sponsor; short-term release scheduling; long-range release planning, storage utilization (seasonal commingled, joint use). Show storage accounting method for more than one use of conservation storage. Reference and discuss example regulation exhibit. If necessary, include an explanation of modeler's intent in development of the hydrologic simulation model relative to water supply deliveries and storage within the project area and beyond the project area.

e) **Recreation.** Identify any special release or operating criteria for recreational activities such as fishing tournaments and competitive boating. Provide a list of passive recreation that is anticipated to result from operation of project's reservoir or storage area, if applicable.

f) **Fish and Wildlife.** Where applicable, describe any special operating criteria necessary to accomplish fish and wildlife objectives, such as fish spawning, waterfowl, endangered species, etc.

g) **Navigation.** Release scheduling, accomplishment in general, lock filling and emptying procedure, aids to navigation, reference and discuss example regulation exhibit, integration with other projects.

h) **Other.** Where applicable, identify any special operating criteria necessary to address other conditions and concerns such as: health and welfare, mosquito control, aquatic plant management, debris control, low flow, freeze protection, special or emergency drawdown, upstream/downstream/adjacent ground water table, releases to aid construction upstream/downstream/adjacent, toxic and hazardous material spills.

9. Pre-Storm/Storm Operations. This paragraph should outline the concept of pre-storm operations such as canal or reservoir/storage area drawdown as it applies to project objectives. Provide an explanation of operating criteria related to pre-storm and storm operations, including rule curves, triggers, water surface elevations, and minimum flows to allow transfer of canal water to reservoir/storage areas. This paragraph should reference or describe procedures for using weather forecasting and National Weather Service broadcasts, as necessary, to determine the timing for implementation of pre-storm/storm operations. Include detailed operating criteria for pre-storm/storm operations during the iterative phases of the project as necessary: Construction Phase, Operational Testing and Monitoring Phase, and Long-Term Operations Phase.

10. Consistency with the Identification of Water and Reservations or Allocations for the Natural System. In the PIR, the Project Delivery Team is required to identify the appropriate quantity, timing and distribution of water for the natural system and other water-related needs in accordance with the process outlined in Guidance Memorandum #4. This paragraph should include a statement that the operating criteria within the POM are consistent with the operating criteria used to identify the water available for the natural system (reference the "Identification of Water for the Natural System" section of the PIR). This paragraph should

also specifically state that the operating criteria will be consistent with the water reservations or allocations for the natural system made by the State in accordance with WRDA 2000.

11. <u>Consistency with Savings Clause and State Assurances Provisions</u>. The operating criteria within the POM will be consistent with those used for evaluating conformance with the Savings Clause during development of the PIR. Describe any special operating criteria that are necessary to fulfill the Savings Clause Provisions in accordance with the PIR. In addition, the operating criteria within the POM will be consistent with those used for evaluating conformance with State assurances provisions during development of the PIR

12. <u>Drought Contingency Plan</u>. Unless a project requires an individual Drought Contingency Plan (DCP), the general regional DCPs located in Volumes 2 through 7 of the System Operating Manual should be utilized. This paragraph should identify the physical location of the DCP that will be used for the subject project component. In addition, the Rules of the SFWMD Water Shortage Plan will be located with the DCP.

13. <u>Flood Emergency Action Plan</u>. Descriptions, completion dates, and physical location of plans (can be attached as an exhibit in the POM or be a stand-alone document) if properly referenced in the POM.

14. <u>Deviation From Normal Operating Criteria</u>. This paragraph should describe approval and notification procedures required when deviations from the POM are necessary. The USACE District Commander is occasionally requested by the non-Federal sponsor to approve deviations from normal operating criteria. Prior approval for a deviation is required from USACE-SAD except as noted in subparagraph "a" below. Deviation requests usually fall into the following categories:

a) **<u>Emergencies</u>.** Examples of emergencies that may result in a need to deviate from normal operating criteria include: drowning and other accidents; failure of the operation facilities; chemical spills; treatment plant failures; and other temporary pollution problems. Water control actions necessary to abate the problem should be implemented immediately unless such action would create equal or worse conditions. The Division Office (SAD) must be informed of the problem and the emergency operating changes as soon as practicable. In addition, the non-Federal sponsor, the State of Florida (FDEP and SFWMD), and the Department of the Interior should be informed.

b) **<u>Unplanned Minor Deviations</u>.** There are unplanned instances that create a temporary need for minor deviations from the normal operating criteria, although they are not considered emergencies. Construction accounts for the major portion of these incidents requiring minor deviations. Examples of activities that may require short-term deviations include construction of utility stream/canal crossings and bridge work. Deviations are also sometimes necessary to carry out maintenance and inspection of facilities. Requests for changes in release rates generally involve time periods ranging from a few hours to a few days. Each request should be analyzed on its own merits. In evaluating the proposed deviation, consideration must be given to

upstream watershed conditions, potential flood threat, the existing condition of the reservoir/storage area, and alternative measures that can be taken. In the interest of maintaining good public relations, requests for minor deviations are generally granted, providing that these deviations will not have adverse effects on the ability of the project (or projects) to achieve its authorized purposes. Approval for these minor deviations normally will be obtained from SAD by telephone. Written confirmation explaining the deviation and its cause will be furnished to the SAD water control manager. In addition, the non-Federal sponsor, the State of Florida (FDEP and SFWMD), and the Department of the Interior should be informed.

c) **Planned Deviations.** Each circumstance should be analyzed on its own merits. Sufficient data on flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes, together with the USACE district recommendation, will be presented by memorandum, facsimile, or electronic mail to the USACE-SAD for review and approval. In addition, the non-Federal sponsor, the State of Florida (FDEP and SFWMD), and the Department of the Interior should be consulted as part of the process of receiving approval from SAD for the deviation.

15. Rate of Release Change. This paragraph should provide the normal allowable rate of increase and decrease in releases from the project features covered by the subject POM.

16. Seepage Control. Provide a detailed explanation of operating criteria to be used during operation of project features for seepage control. Include conditions when operation of features for seepage control is not beneficial such as when a reservoir or storage area is at design capacity. This discussion should include detailed operating criteria, as appropriate, for seepage control during the iterative phases of the project: Construction Phase, Operational Testing and Monitoring Phase, and Long-Term Operations and Maintenance Phase.

17. Initial Reservoir/Storage/Treatment Area Filling Plan. Briefly describe the initial filling plan for projects involving reservoirs, impoundments, natural storage and treatment areas, and/or stormwater treatment areas. Include information on the preferred filling rate, the available options to control the filling rate, the consequences of sole purpose operation to control the rate, water quality requirements for the initial filling, and the most probable types of problems that might develop during the initial filling. Reference any documents prepared for the testing and/or initial use of project water management structures and equipment. Describe the proposed hydrologic data collection and transmission system and the plans for reading and evaluating instrument data and making visual inspections of the dam and downstream areas, both related to increments of pool level. Also describe which agency/organization will be responsible for decisions and implementation of emergency plans as necessary. Outline guidelines on conditions requiring notification of personnel in that organization and implementation of emergency plans. Completion of this paragraph is not necessary for the Draft POM prepared for the PIR/EIS. The first version of this paragraph will be completed for the Draft POM that will be used for the Operational Testing and Monitoring Phase of the project.

18. **Non-Typical Operations for Reservoir/Storage/Treatment Area Performance.** Describe any procedures and changes in operating criteria to be used for minimizing or avoiding dryout during a drought. Describe anticipated operations during routine maintenance or during situations where portions of the project are offline or out of service. Identify storage/treatment area refilling plan to be used following drought or offline operations. Refer to paragraph 17, Initial Reservoir/Storage/Treatment Area Filling Plan, if the refill operations are similar.

19. Aquifer Storage and Recovery (ASR) System Plan. This paragraph should provide a description of how the project's water management structures will be integrated with ASR System capabilities. It should provide a general description of the ASR System, including the objectives, components, storage capacity, and pumping and discharge capabilities. It should also include a detailed explanation of typical operating criteria, as well as changes in operating criteria that may result from use of weather forecasts, for the water management structures as they relate to management of water provided by and utilized by the ASR System. This discussion may include operating criteria for seasonal water storage to meet peak demands, long-term storage to meet drought demands, emergency operations for potable water, and the operations for water supply augmentation and flood damage reduction. This paragraph should also include a general explanation of the ASR System operations as they relate to the project's water management structures and reservoir/storage area capacity. Depending on the project, implementation of the ASR System may be an iterative process.

20. Water Control Data Acquisition System Plan (WCDASP). Provide a statement that the WCDASP may be started during the PIR phase, will probably be completed during the Plans and Specifications Phase, and will be a subset of the Water Control Data System (WCDS) that is specific to CERP. This paragraph should provide a general description of the telemetry system, automation components, or equipment related to the project's water management structures. It should also identify the agency/organization that is responsible for operation and maintenance of the system or the system components. Include a description of the relationship between the environmental monitoring plan and the WCDASP. Equipment used in data acquisition essential to the water management function will be included in the WCDASP. This includes all hardware and software to be used for acquisition, transmission, processing, display, and dissemination of hydrological, meteorological, water quality, and project data for the purpose of supporting the water control mission. This may include, but is not limited to; uninterruptible power supplies, field data collection platforms, and data communication devices and circuits. The WCDASP will also identify site location of all hardware included within the Plan. Hardware siting and gage reference datum will be determined through coordination with appropriate agencies including the U.S. Geological Survey (USGS) and the SFWMD. If this plan is over one page in length, it could be referenced in this paragraph and included as an exhibit.

21. Consistency with the Adaptive Management Program and Periodic CERP Updates. This paragraph should include a statement that after long-term operations and maintenance of the project has been initiated, the POM may be further modified based on operating criteria approved by the USACE and SFWMD resulting from CERP updates and recommendations from the adaptive assessment process as outlined in Guidance Memorandum #6.

NOTE: The sections below that follow the main text of the document will be preceded by individual title pages:

- **Tables.**

- **Figures.**

- **Plates/Operational Schematics.**

- **Exhibits.** NOTE: Label the following items as exhibits instead of appendices, reserving the latter term to tie individual POMs with their respective SOMs. The number of exhibits will vary from project to project. "Standing Instructions to Project Operators" should be the last exhibit.

  - Structure Descriptions and Rating Curves.
  - Formal Agreements. Examples are:
    - Memorandums of Understanding
    - Field Working Agreement
    - Section 7 Flood Control Regulations
    - Letters from other agencies or minutes of requesting commissions acknowledging or concurring in important or unusual aspects of the operating manual. To conserve space it may be desirable to show only the portion of the contract pertinent to water management, e.g., omit payment schedules.
  - Water Control Data Acquisition System Plan
  - Standing Instructions to Project Operators
  - Other (e.g. supplementary pertinent data)

ATTACHMENT 5-B
FORMAT AND CONTENT OF THE SYSTEM OPERATING MANUAL

I. FORMAT OF THE SYSTEM OPERATING MANUAL

Each volume of the SOM will contain nine chapters, outlined and briefly defined in Section A of this attachment. However, the nine chapters of the System-wide, Volume 1, will be modified somewhat to address the system-wide framework, and are listed separately. The outline for Volumes 2 through 7 is modeled after page A-63 in Engineering Regulation 1110-2-8156, Preparation of Water Control Manuals. Volumes 2 through 7 will generally follow the original format of the Master WCMs for the existing C&SF Project, with a few exceptions to accommodate the CERP POMs. When individual pages are revised within the SOM, they will be clearly identified with the date of revision.

A. Chapter Outline and Annotated Descriptions

SYSTEM OPERATING MANUAL
VOLUME 1 – SYSTEM-WIDE

I. Introduction – Discussion of purpose, scope, and operating agency.
II. Authorizations – Detailed discussion of project authorizations.
III. System-wide Watershed Description and Characteristics – Provide system-wide description and characteristics.
IV. Description of System Components – Description of the major project subdivisions as laid out in Volumes 2 through 7 of the System Operating Manual.
V. Data Collection and Communication Networks – Overview of data collection and communication networks.
VI. System Hydrologic Forecasts – Description of system-wide forecasts.
VII. System Operating Manual – Discussion of the ability of the SOM to meet project purposes. Focus on water management at the system-wide level.
VIII. Effect of System Operating Manual – Discussion of system-wide effects and benefits from the SOM.
IX. Water Management Organization – Discussion of responsibilities, organization, and interagency coordination.

- Tables
- Figures
- System-wide schematics
- Exhibits
- Appendix A – Discretionary Changes

SYSTEM OPERATING MANUAL
VOLUMES 2 THROUGH 7

NOTE: As stated previously, a "History of Revisions" table will be located in the front of each of the Volumes 2 through 7 of the SOM.

I. Introduction – Discussion of purpose, scope, and operating agency.
II. Regional Description – Provide regional description.
III. Regional History – Provide general history of the region.
IV. Watershed Characteristics – Provide regional characteristics.
V. Data Collection and Communication Networks – Overview of data collection and communication networks.
VI. Hydrologic Forecasts – Description of regional forecasts.
VII. System Operating Manual – Discussion of the ability of the SOM to meet project purposes for that specific hydrologic region. Focus on water management at the regional level.
VIII. Effect of System Operating Manual – Discussion of regional effects and benefits from the SOM for that specific hydrologic region.
IX. Water Management – Discussion of responsibilities, organization, and interagency coordination.

- Tables
- Figures
- Appendix A – Structure Descriptions and Rating Curves
- Appendix B – Project Operating Manuals
- Appendix C – Drought Contingency Plan
- Appendix D – Interagency Coordination
- Appendix E – Flood Control Regulations
- Appendix F – Standing Instructions to Project Operators

ATTACHMENT 5-C
GUIDELINES AND EXAMPLES FOR OPERATING MANUAL CONTENT FOR WATER QUALITY CERTIFICATION ASSURANCES

This attachment provides general guidance on information necessary to provide reasonable assurances for water quality permitting. Project Operating Manuals (POMs) should provide sufficient information to demonstrate that proposed operations would be consistent with applicable State water quality standards and requirements. The Draft POM will be included in the water quality certification (WQC) application provided to the Florida Department of Environmental Protection (FDEP). Along with the other application materials, it will be evaluated to determine whether the project can be constructed, operated, and maintained in compliance with applicable water quality standards and applicable WQC requirements.

This attachment provides examples of the type of information that should be furnished for most projects and some specific examples from existing operating criteria documents. It is recognized that these projects vary widely and therefore project-specific issues/concerns may need to be addressed. As a result, this guidance should not be interpreted as exhaustive or limiting in scope. Additional information may be necessary on a project-specific basis. It is also possible that the examples provided below may not be applicable to a given project and therefore would not be included in the POM.

It should be noted that depending on the activity being authorized, the required content of the POM may vary. In some cases, construction, operation, and maintenance authorization are being sought, while in others only construction authorization or operation and maintenance authorization are being sought. For instance, it should be noted that the USACE is not normally responsible for structure operations, and therefore, under most circumstances, is not the applicant for the operational authorization. However, USACE may be involved in functional testing of structures during the Construction Phase and the Operational Testing and Monitoring Phase in order to develop the Operating Manual. In this instance, the USACE would be seeking authorization of construction activities and Operational Testing and Monitoring Phase activities, while the non-Federal sponsor would seek a separate authorization for long-term operation and maintenance of the project.

Ideally, construction, operation, and maintenance authorization will be sought concurrently, with the goal being to obtain the water quality permit following completion of the PIR. However, this is not always possible. If the permit application (including the Operating Manual) contains enough information to provide FDEP with all necessary assurances, a water quality permit may be issued at the completion of the PIR. Table 5-C-1 identifies the phase of the POM and the general content that will be necessary to demonstrate reasonable assurances for each activity:

Table 5-C-1: General Content Needed to Demonstrate Reasonable Assurances for Activities in the Project Operating Manual

Activity	Phase of Operating Manual	Content
Construction	Draft Project Operating Manual	Interim Operations during Construction, Preliminary information on Operational Testing and Monitoring Phase Operations
Operational Testing and Monitoring Phase	Draft Project Operating Manual	Operational Testing and Monitoring Phase Operations, including Modifications Resulting from Adaptive Assessment
Operations and Maintenance	Project Operating Manual	Final Operating Criteria, including Modifications to Draft POMs

The following items and examples correspond to Sections II and III of Attachment 5-A (Documents referenced below are available upon request).

Pertinent Data:
Identification of design peak flow conditions and standard project flood

Examples:

- STA-1W: The Standard Project Storm (SPS; 120% of the 100 year/24-hour storm) rainfall depth is estimated as 23.6 inches for a 24-hour duration over a 10-square mile basin area. During an SPS event, it is recommended to restrict inflow through structure G-302 to 1,110 cfs. For an SPS event, the estimated STA-1 inflow Basin maximum stage elevation was 19.4 ft-NGVD.
- Cerrillos Dam and Reservoir: The Standard Project Flood (SPF) was routed using the following assumptions: (1) reservoir level at the beginning of the flood would be at the top of he conservation pool, elevation 537.0 ft, NGVD; (2) Outlet works would be inoperative during the flood; and (3) that the spillway would consist of a 394-ft. wide uncontrolled emergency spillway with a crest elevation of 611.3 ft., NGVD. The SPF routed maximum reservoir level is at elevation 627.6 ft., NGVD. The design discharge for the spillway is 15,190 cfs so that this flow, combined with local inflows downstream, would not exceed the SPF capacity of the Ponce channels (21,739 cfs).

Introduction:
Identification of developmental phase of project operating manual

Examples:

- Draft POM for Operations during Construction
- Final Phase of the POM

General Project Purposes, Benefits, Goals or Objectives:
1. Identification of any water quality purposes of the project

Examples:

- Phosphorus reduction
- Reduction of freshwater pulse releases

2. General explanation of how the proposed operations meet the water quality purposes of the project

Example:

Preliminary Water Plan for the Ten Mile Creek Storage Area (TMC): Rapid pumping to the reservoir and slow drainage from the reservoir mimics the behavior of shallow surface storage that has been lost through development over the years. When operated correctly, the reservoir reduces runoff from most storm events and helps restore the historic flow patterns of freshwater entering the estuary.

Project Features:

1. Description of project features by basin including water control structures, reservoirs, stormwater treatment areas, etc.

Example:

- TMC: Water will be put into the reservoir via S-382, a 380 cfs pump station, located on the northern levee adjacent to the creek. S-382 will consist of three pumps; one 60 cfs pump and two with 160 cfs pumping capacity. In addition, the pump station will have a return bay with a 200 cfs capacity for flows from the reservoir back to the creek.

2. Identification of downstream receiving waters and the "restoration objective water body", specify flow path

Example:

- TMC: The immediate downstream receiving water is C-96. The water will then flow into Ten Mile Creek, downstream of the Gordy Road Structure. Ten Mile Creek then flows into the North Fork of the St. Lucie River which discharges into the Indian River Lagoon. Ten Mile Creek, St. Lucie River, and Indian River Lagoon are all considered restoration objective water bodies.

3. Description of outflow discharge scenario, including, but not limited to, point or sheetflow discharge

Example:

- TMC: The outflow structure will consist of a gravity control structure, which will be a point discharge into the North St. Lucie River Water Control District's Canal 96. From this point, the water will flow north in Canal 96 and discharge downstream of the existing "Gordy Road" control structure on the eastern end of Ten Mile Creek.

4. As appropriate, brief description of feature's water quality design goal- such as STAs (State target constituent level) and polishing cells (statement of no target level)

Example:

- Indian River Lagoon South Project (IRL-S): (Structure discharge to meet salinity envelope in the estuary.) When the daily average salinity measured at the Roosevelt Bridge in the St. Lucie Estuary is above 12 ppt, pump station S-421 will be triggered when there is over 1000 cfs flow at spillway structure S-49, and 50% of the flow will be

captured in the reservoir. When the daily average salinity measured at the Roosevelt Bridge in the St. Lucie Estuary is between 12-10 ppt, pump station S-421 will be triggered when there is over 500 cfs flow at S-49, and 50% of the flow is captured up to 900 cfs full capacity.

5. Identification of storage volume and treatment area available

Example:

- TMC: The reservoir and treatment cell will have a total storage capacity of 6,000 acre-feet. The reservoir will have 526 acres of effective storage area and the treatment cell will have 132 acres of treatment area.

Project Relationships and Interactions:

1. Description of any structural or operational changes necessary during construction. Consideration of existing structures and their operations, as well as temporary and new features resulting from the project's ongoing construction phase

Examples:

- Kissimmee River Restoration Project (KRRP): (Relocation of a structure.) Boat launching ramps at S-65, S-65B and S-65C will be relocated to the edge of the flood plain. Ramps will be connected with the restored river by access channels.
- KRRP: U.S. Highway 98 will be temporarily relocated to maintain traffic flow during construction of bridge openings. A temporary 840-foot bypass extending 50 feet south of the existing road will be constructed on existing spoil.

2. Consideration of interactions with operations and features of other projects existing, under construction, planned, or scheduled, that are upstream, downstream, or in the vicinity of the subject project

Example:

- STA-1West: Spillway 5AS (S-5AS) has historically been used to facilitate water supply releases from Water Conservation Area 1 (WCA-1) to the L-10, L-12, L-8, and C-51 basin for irrigation. Since the construction of the STA-1 Inflow Basin, operation of S-5AS for water supply requires reverse flows through diversion structures G-300 and G-301. This, in turn, necessitates the closing of inflow structure G-302, preventing flows from entering STA-1W until irrigation demands are met.

3. Operations to satisfy pump station warranty requirements

Example:

- STA-1West: Maintenance requirements for the G-310 discharge pump station include operation of the pumps for approximately 2 to 4 hours per month as necessary, to maintain their mechanical integrities.

Operations to Meet Project Purposes:

1. General description of movement and storage of water

2. Optimum water elevations, may be season dependent

Examples:

- S-9A: Seepage from higher water levels in WCA-3A and WCA-3B flows eastward toward the Western C-11 drainage basin. The purpose of the project is to backpump seepage at S-9A into WCA-3A at the same rate it enters the 7900 feet of C-11 Canal from the S-9A pumps to the S-381 gates. The S-381 structure acts as a canal divide to separate the urban area to the east of the structure from the mainly natural area located to the west

- STA-1 West: Target stage/depths for both wet and dry seasons were established for the STA-1 West treatment cells. (These target depths for Cell 1 and 2, shown below in Table 5-C-2, are from Table 1, p.28, STA-1West Operation Plan.)

Table 5-C-2: Example Wet/Dry Season Target Stages from STA-1W Treatment Cells

Cell	Wet season/Target Stage (+/- .2 ft.)	Dry Season Conservation Stage/Depth when available (+/- .2ft.)	Measured at Structure	Operational Structure
1	11.9/1.8	12.4/2.3	G-253 HW	N/A
2	11.7/2.25	12.2/2.75	G254 HW	N/A

3. Maximum water elevations, may be season dependent

Example:

- STA-1 West: The maximum operational depth for treatment cells 1, 2, 3, and 4 has been established at 4.5 ft above average ground elevation.

4. Minimum water elevations, may be season dependent

Example:

- STA-1 West: To the extent practicable, operations of STA-1West will maintain stages at or above the 0.5 feet above the average ground elevation in the treatment cells to minimize potential negative effects of drought on subsequent project performance.

5. Pump station operational limitations

Example:

- Pump Station 6 (S-6): The present drawdown limit is elevation 9.0 ft NGVD. Pumps may overheat if head > 7.0 ft. If, during a pumping operation, the water surface on the intake bay falls below elevation 9.0 ft NGVD as indicated by the staff gauge, the speed of all pumps then operating should be reduced to not less than 500 rpm. If this does not restore the water surface in the intake pool to elevation 9.0 ft. NGVD, one or more of the pumping units should be shut down until the minimum pool elevation is re-established.

6. Statement of any operations or coordination procedures for water quality and any beneficial water quality aspects of each component

Examples:

- Algae Blooms in the Caloosahatchee River (C-43): During the seasonally dry months from December to April of each year, the Caloosahatchee River flow diminishes to the point that severe algae blooms may develop in the River above the Franklin Lock and Dam. Municipal water intakes in this area could be clogged with the algae. Short-term high rates of discharge from Lake Okeechobee are required to break up the algae bloom.
- Salinity Intrusion in the Caloosahatchee River (C-43): During the extreme dry months of April and May, the river flow may drop to near zero. When this condition prevails, navigation lockages through the W.P. Franklin Lock may allow a saltwater wedge to move upstream. Eventually, the chloride content of the water can exceed the drinking water standard of 250 ppm. When this occurs, SFWMD requests the USACE to flush out the saltwater with a short-term high rate of discharge from Lake Okeechobee.

Flood Damage Reduction:

1. Description of areas of concern adjacent to project area

Example:

- STA-1 East: S-361 is a secondary inflow pump station that discharges directly to Cell 4S. It is intended to provide drainage and flood control service to those lands south and east of S-361 which were tributary to the C-51 West Canal, but have been hydraulically severed as a result of the construction of STA-1 East. Those lands consist of Rustic Ranches Subdivision, and agricultural lands west of Flying Cow Road and south of Rustic Ranches. In addition, seepage accumulated along the east line of STA-1East may be pumped into STA-1East by S-361.

2. Sequencing of structure operations including operating criteria - can be presented in a table, may be season dependent

3. Brief description of standard project flood used to design and operate project features

Example:

- STA-3/4: The Standard Project Storm ranges between 36.0 and 56.0 inches for a 3-day duration storm depending on site-specific conditions and risk management considerations. STA-3/4 is considered low risk because of its long distance from major urban population centers. Therefore, a maximum 3-day precipitation depth of 36 inches was employed in the design of STA-3/4 as described in the Plan Formulation Document.

4. Identification of operations during high flow events (or address in uncontrolled discharge section)

Example:

- S-80: During regulated maximum flood releases, the minimum headwater elevation at St. Lucie Spillway (S-80) will be operated no lower than 10.0 ft., NGVD for lake stages up to 18.5 ft., NGVD. This is to help reduce erosion upstream of the dam due to high velocities. However, through past experience, it has been determined that an effort should be made to prevent the headwater at S-80 from receding below 12.0 ft., NGVD in order to avert problems with the nearby local irrigation pump intakes.
- STA-3/4: Summary of STA structure operations required during SPS event: maintain full pumping through Pump Stations G-370 and G-372; fully open all interior control

structures; keep diversion structures G-371 and G-373 closed; operation seepage pumps within their capacity to maintain 8.0 ft NGVD within the seepage canal; and operate pump stations within their capacity to maintain headwater stages of 14.0 ft NGVD or lower.

Pre-Storm/Storm Operations:

1. Statement of project features operation initiation requirements

Example:

- Interim Operational Plan for Protection of the Cape Sable Seaside Sparrow (IOP): Between 24 and 72 hours before tropical storm conditions in Miami-Dade, the following target water levels are set for the South Dade Conveyance System (SDCS). The initiation of the pre-storm drawdown criteria will be triggered when Dade County falls within the average error forecast swath as developed by the National Hurricane Center (NHC). These pre-storm drawdown levels are not less than the level at which water supply deliveries are made during dry periods, that is 1.5 ft. below optimum canal levels, except the reach north of G-211, which is 1.0 ft below current, normal operating levels.

2. Sequencing of structure operations including structure operating criteria - can be presented in a table, may be season dependent

Example:

- IOP: In an effort to achieve the specified drawdown targets, a sequence of operational actions is recommended as described in Table 5-C-3. The goal is to achieve one target before proceeding to the next sequence. However, since it may not always be possible to achieve the target level, operations will proceed based on the best available information at the time:

Table 5-C-3: Example Drawdown Targets for Various Reaches of L-31N and C-111

Sequence	Canal	Reach	Target Draw-Down Level (ft.)
1	L-31N	S-331to S176	4.0
	C-111	S-176 to S-177	3.0
2	L-31N	G-211 to S-331	4.0*
	L-31N	S-335 to G-211	5.0

* If Angel's well is 5.5 ft-NGVD or below, then 4.0 would be the target, otherwise, 3.5 ft-NGVD at the headwater of S-331 will be the target.

Water Quality:

1. State operations designed to achieve water quality objectives (including water quality performance measures and MFLs) or avoid water quality constraints

Example:

- IRL: When the daily average salinity measured at the Roosevelt Bridge in the St. Lucie Estuary is below 10 ppt, pump station S-421 will be triggered when there is over 500 cfs flow at S-49, and all flow is captured up to 900 cfs capacity.

2. Overview of coordination process to be used during the construction phase to ensure compliance with water quality standards

3. Sequencing of structure operations including structure operating criteria - can be presented in a table, may be season dependent

Examples:

- IRL: Proposed wet and dry season operations for the reservoir and STA are shown in Table 5-C-4.

Table 5-C-4: Example Wet And Dry Season Operations For IRL Reservoir And STA

Reservoir Depth (foot)	Wet Season (June to November) Discharge to STA (cfs)	Dry Season (December to May) Discharge to STA (cfs)
1	10	5
2	25	5
3	40	10
4	60	20
5	80	30
6	100	40
7	100	50
8	100	100

- When S-401 is off, STA release from structures S-482 and S-498 shall be adjusted according to the daily average salinity measured at the Roosevelt Bridge in the St. Lucie Estuary, as shown in Table 5-C-5.

Table 5-C-5: Example STA Releases at the Roosevelt Bridge

Salinity (ppt)	STA Release (cfs)
>12	600
12-10	400
10-6	200
<6	0

Water Supply:

1. Sequencing of structure operations including structure operating criteria - can be presented in a table, may be season dependent

Examples:

- IRL: During the dry season when there is a water supply demand in the C-23 basin, water stored in the southern reservoir will be discharged back into C-23 via drawdown structure S-413, at a maximum rate of 300 cfs.
- Site 1 Impoundment Project: Water supply releases are made from the Site 1 Impoundment via S-526A when the Hillsboro Canal upstream of G-56 recedes to either 6.5-6.9 ft NGVD during the wet season or 7.8-8.2 ft NGVD during the dry season. Water supply releases from the impoundment will continue until the Hillsboro Canal reaches either 7.3-7.7 ft NGVD during the wet season or 8.3-8.7 ft NGVD during the dry season, or until the Impoundment falls to 10.8-11.2 ft NGVD, whichever occurs first.

Recreation:

If applicable, state any structure operating criteria - may be season dependent

Fish and Wildlife:

1. Sequencing of structure operations including structure operating criteria - can be presented in a table, may be season dependent

Example:

- Manatee Gate Operations: Single or multiple gates at S-77: (1) To allow manatees to pass under the gates, the minimum opening for any gate under the "less than or equal to 3.0 feet of head" condition is 2.5 ft. (2) If during the adjustment process, the head across he structure should exceed 3.0 ft, the gates should be closed in reverse order to openings permitted by the MAGO curves, and the operating procedures applicable to head greater than 3.0 ft should then be used.

Navigation:

If applicable, state any structure operating criteria - may be season dependent

Initial Reservoir/Storage/Treatment Area Filling Plan:

1. Identification of any water quality considerations during initial filling, pump tests, or refill event

Example:

- STA-3/4: Since some of the vegetation will not be full grown by the time of startup, certain precautions are required for storm and intra-event conditions. Operational stage elevations will necessarily be required to be lower in cells that have in complete vegetation coverage. Once all vegetation coverage is complete, as determined by the site manager, normal STA-3/4 operations can commence.

2. State operations that include preventing discharge from storage/treatment area to avoid water quality constraints

Example:

- STA-3/4: In order to avoid the potential for initial discharges of higher concentrations of mercury following construction and initial filling (flooding) of the STA, samples will be

collected to demonstrate that outflow concentrations of mercury are less than inflow concentrations, prior to initiating discharges.

Non-Typical Operations for Reservoir/Storage/Treatment Area Performance:

1. Drought Operations: Detail any procedures for minimizing or avoiding dryout, see DCP as appropriate

Example:

- STA-1 East: The static water level within the treatment cells, to the greatest extent practicable, will be maintained to minimize potential negative effects of drought on subsequent project performance. All treatment cell interior structures will be operated to maintain the best distribution of available inflows. Outflow structures S-365, S-369, and S-372 will be closed to detain available water within the treatment cells. All treatment cell interior structures will remain open. Outflow pump station, S-362, will not discharge until desirable water levels and vegetative conditions within the treatment cells have improved, allowing for treatment cell discharge.

2. Treatment Cells Out of Service: Describe anticipated operations during routine maintenance or during situations where portions of the project are offline/out of service

Example:

- STA-1 West: Treatment cells and/or flow-ways may be isolated or "taken off-line", when deemed necessary. Treatment Cells 5A and 5B can be taken off-line by closing structures G-304 A-J and G-306 A-J. Treatment Cells 1 through 4 can be taken off-line by closing G303. Treatment flow-ways 1/3 and 2/4 also have the capability of being taken off-line independently through manipulation of their various inflow and outflow structures.

3. Storage/Treatment Area Refill: Identify storage/treatment area refilling plan to be used following drought or offline operations. If refill operations are similar to Initial Storage Area Filling Plan, refer to Item 17 in Section III of Attachment 5-A.

Aquifer Storage and Recovery (ASR) System Plan:

1.General description of ASR system including objectives, components, storage capacity, and pumping and discharge capabilities

2. Description of relationship between existing water management structure operating criteria and operating criteria of the ASR system

3. State operations affecting interaction of project features and ASR

Example:

- Temperature equilibration

Exhibits:

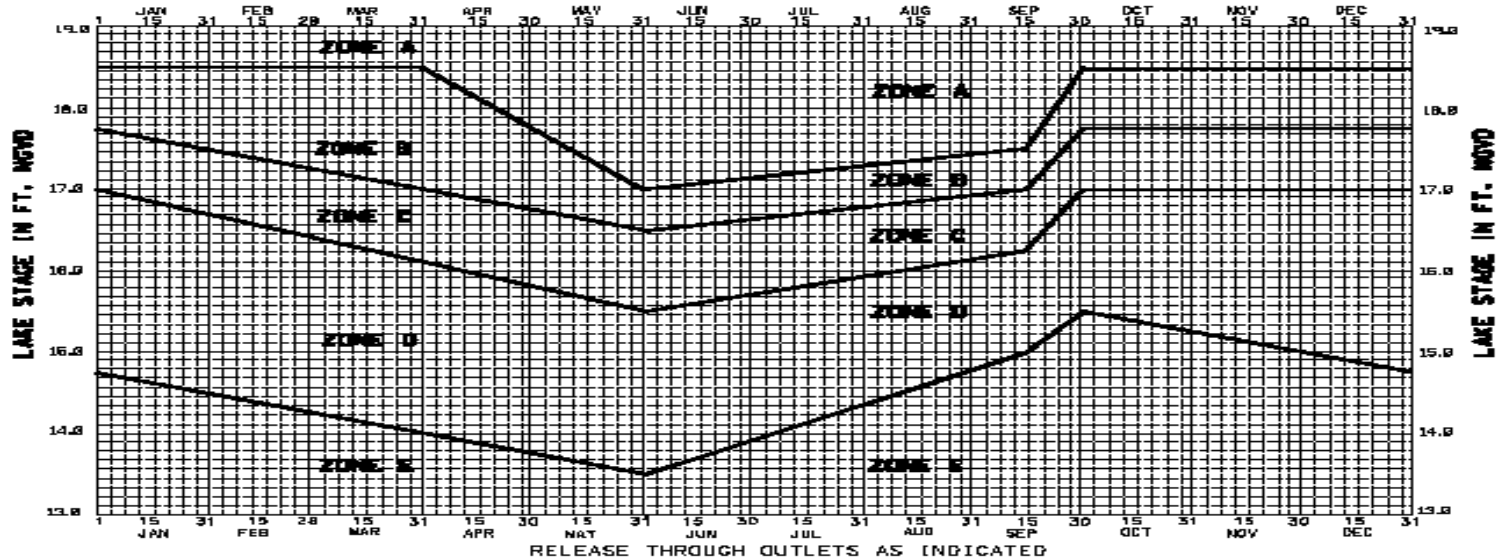
1. Stage-duration curves

2. Discharge rating curves

ATTACHMENT 5-D
EXAMPLES OF OPERATIONAL SCHEMATICS AND FIGURES

Reference the following examples when developing operational schematics and other figures for inclusion in the POMs. In order, they are:

- Figure 5-D-1: Lake Okeechobee WSE Regulation Schedule
- Figure 5-D-2: WSE Operational Guidelines Decision Tree, Part 1
- Figure 5-D-3: WSE Operational Guidelines Decision Tree, Part 2
- Figure 5-D-4: Indian River Lagoon South: C-25 Basin Operations
- Figure 5-D-5: Indian River Lagoon South: C-23/C-24 Basin Operations
- Figure 5-D-6: Site 1 Impoundment Project Site Layout
- Figure 5-D-7: Example of Structure Description and Operating Criteria Table
- Figure 5-D-8: Example of Structure Rating Curve



ZONE	AGRICULTURAL CANALS TO WCAs (1,2)	CALOOSAHATCHEE RIVER AT S-77 (1,2,4)	ST. LUCIE CANAL AT S-80 (1,2,4)
A	PUMP MAXIMUM PRACTICABLE	UP TO MAXIMUM CAPACITY	UP TO MAXIMUM CAPACITY
B (3)	MAXIMUM PRACTICABLE RELEASES	RELEASES PER DECISION TREE (THESE CAN RANGE FROM MAXIMUM PULSE RELEASE UP TO MAXIMUM CAPACITY)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM MAXIMUM PULSE RELEASE UP TO MAXIMUM CAPACITY)
C (3)	MAXIMUM PRACTICABLE RELEASES	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 6500 CFS)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 3500 CFS)
D (3,5)	AS NEEDED TO MINIMIZE ADVERSE IMPACTS TO THE LITTORAL ZONE WHILE NOT ADVERSELY IMPACTING THE EVERGLADES. (SEE NOTE 5.)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 4500 CFS)	RELEASES PER DECISION TREE (THESE CAN RANGE FROM NO DISCHARGE UP TO 2500 CFS)
E	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE

NOTES: (1) SUBJECT TO FIRST REMOVAL OF RUNOFF FROM DOWNSTREAM BASINS
(2) GUIDELINES FOR WET, DRY AND NORMAL CONDITIONS ARE BASED ON: 1) SELECTED CLIMATIC INDICES AND TROPICAL FORECASTS AND 2) PROJECTED INFLOW CONDITIONS. RELEASES ARE SUBJECT TO THE GUIDELINES IN THE WSE OPERATIONAL DECISION TREE, PARTS 1 AND 2.
(3) RELEASES THROUGH VARIOUS OUTLETS MAY BE MODIFIED TO MINIMIZE DAMAGES OR OBTAIN ADDITIONAL BENEFITS. CONSULTATION WITH EVERGLADES AND ESTUARINE BIOLOGISTS IS ENCOURAGED TO MINIMIZE ADVERSE EFFECTS TO DOWNSTREAM ECOSYSTEMS.
(4) PULSE RELEASES ARE MADE TO MINIMIZE ADVERSE IMPACTS TO THE ESTUARIES
(5) ONLY WHEN THE WCAs ARE BELOW THEIR RESPECTIVE SCHEDULES

CENTRAL AND SOUTHERN FLORIDA
INTERIM REGULATION SCHEDULE
LAKE OKEECHOBEE

DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA
DATED: 5 NOVEMBER 1999

WSE (WITH CLIMATE OUTLOOK)

Figure 5-D-1: Lake Okeechobee WSE Regulation Schedule

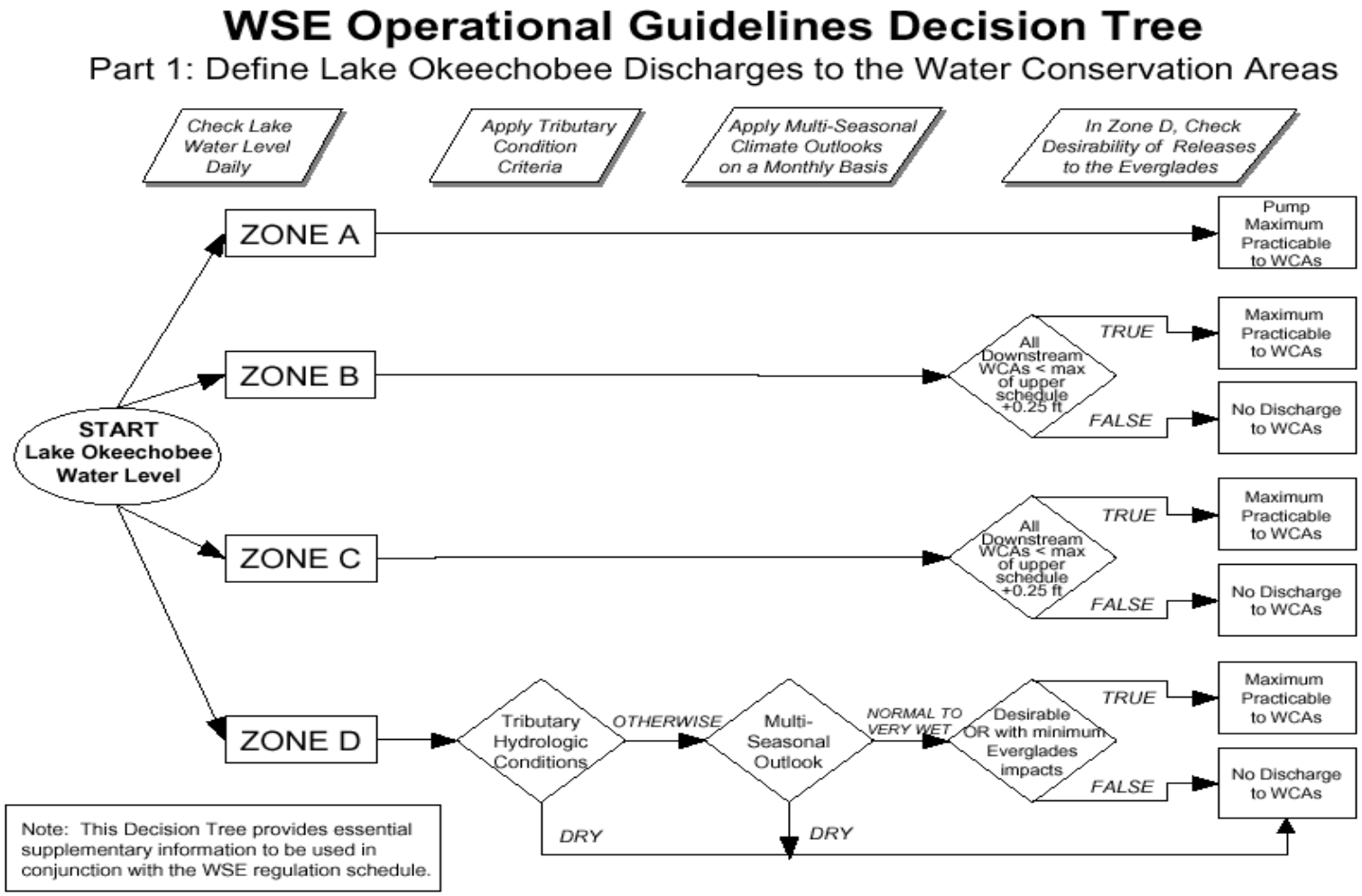


Figure 5-D-2: WSE Operational Guidelines Decision Tree Part 1

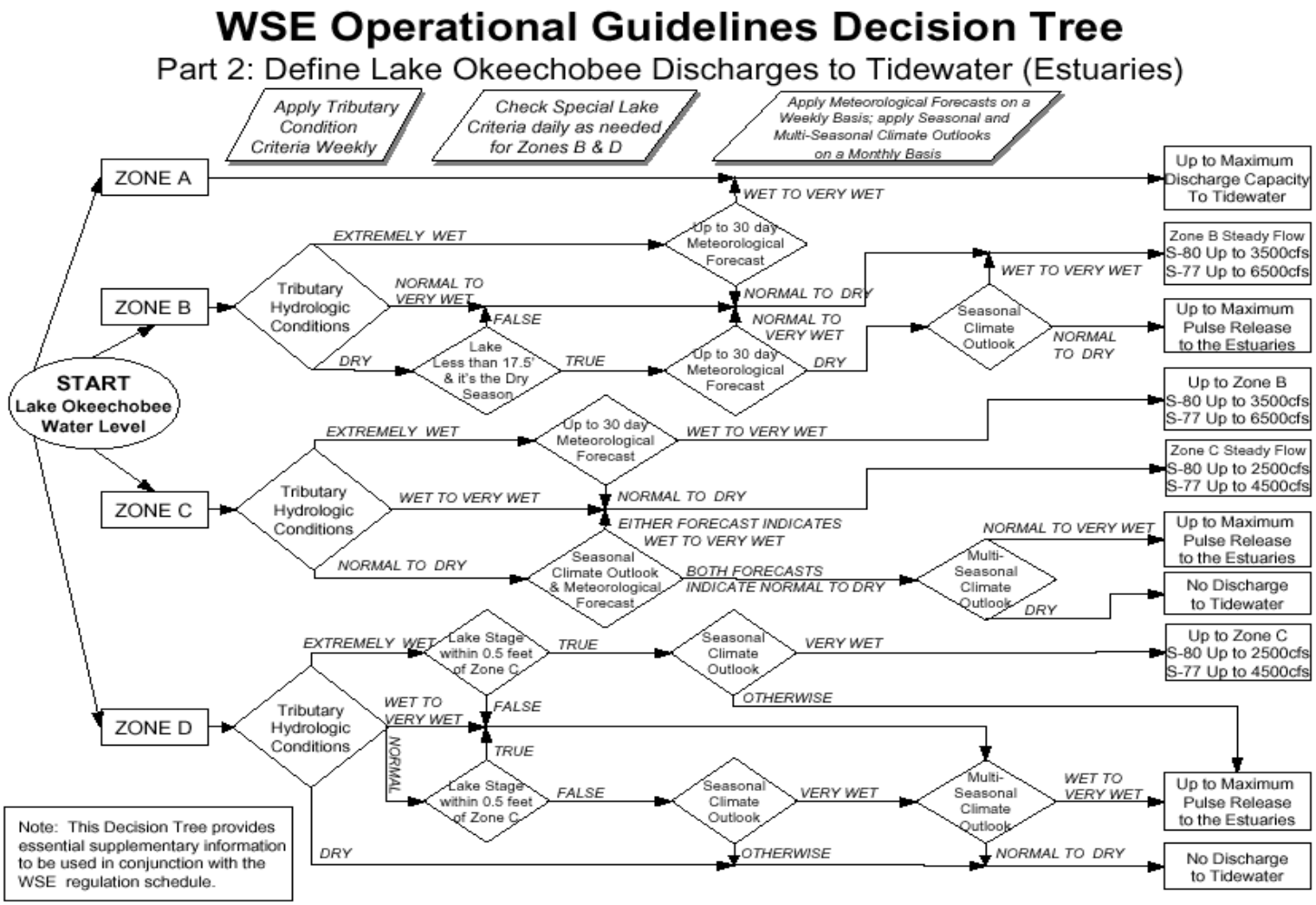


Figure 5-D-3: WSE Operational Guidelines Decision Tree Part 2

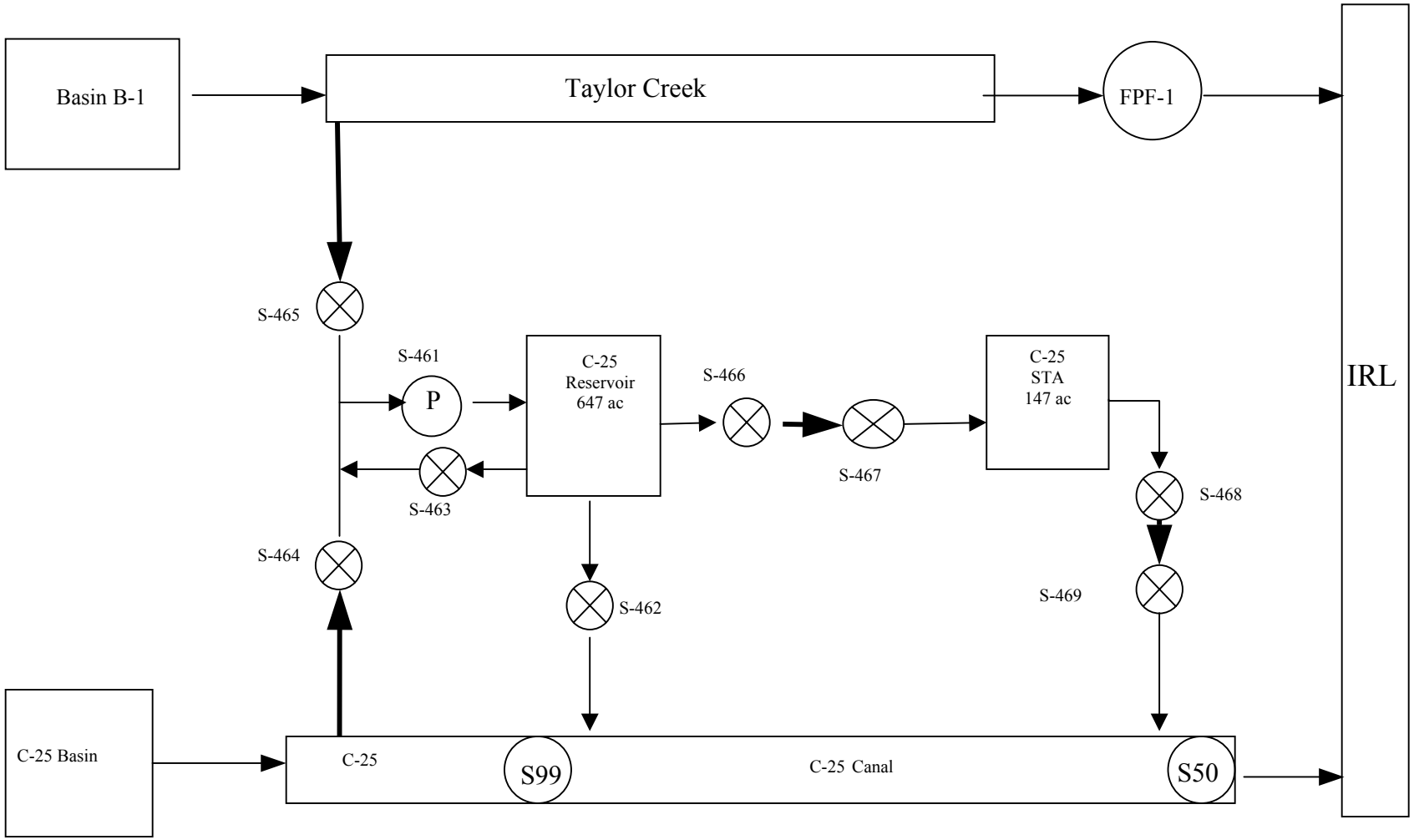
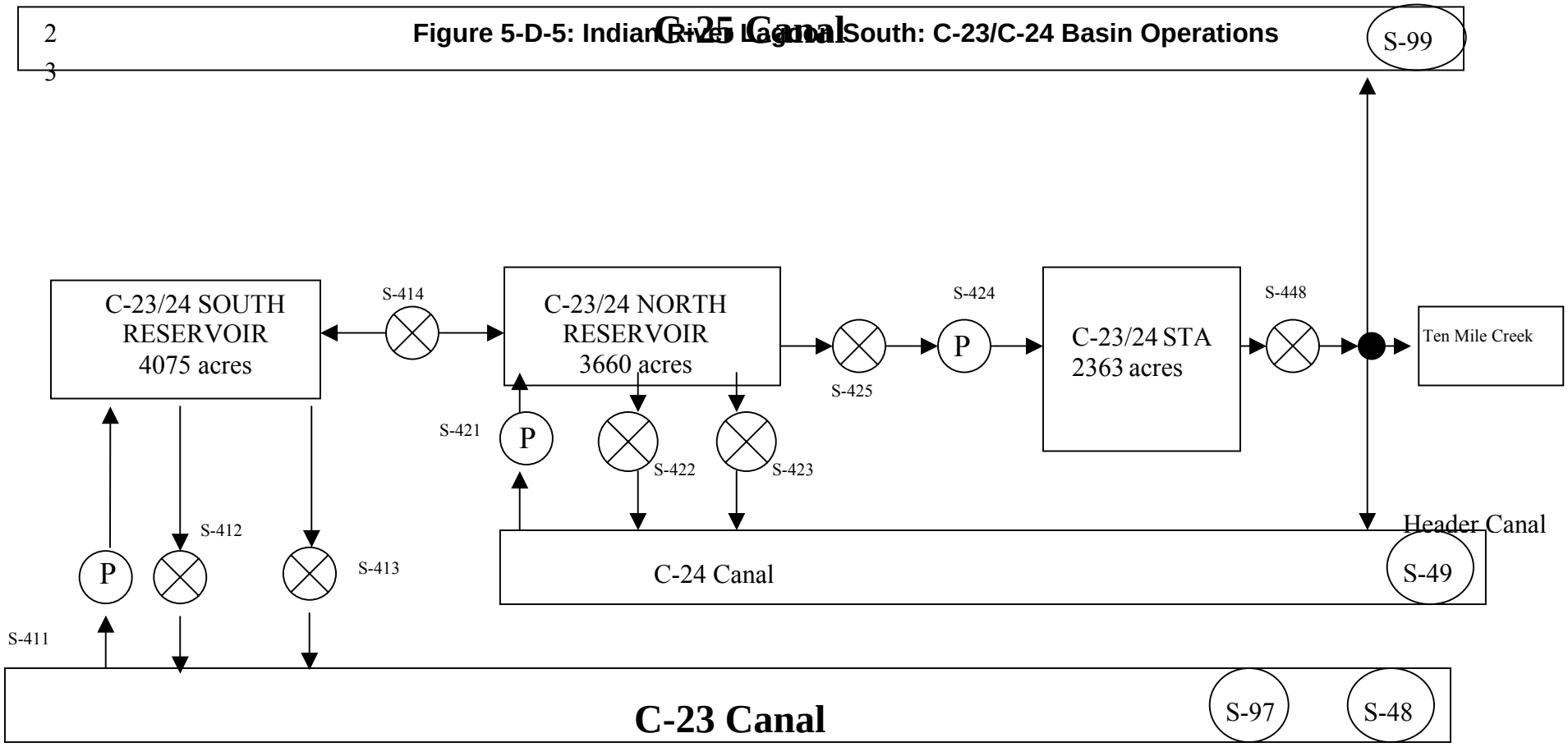


Figure 5-D-4: Indian River Lagoon South: C-25 Basin Operations

Figure 5-D-5: Indian River Lagoon South: C-23/C-24 Basin Operations



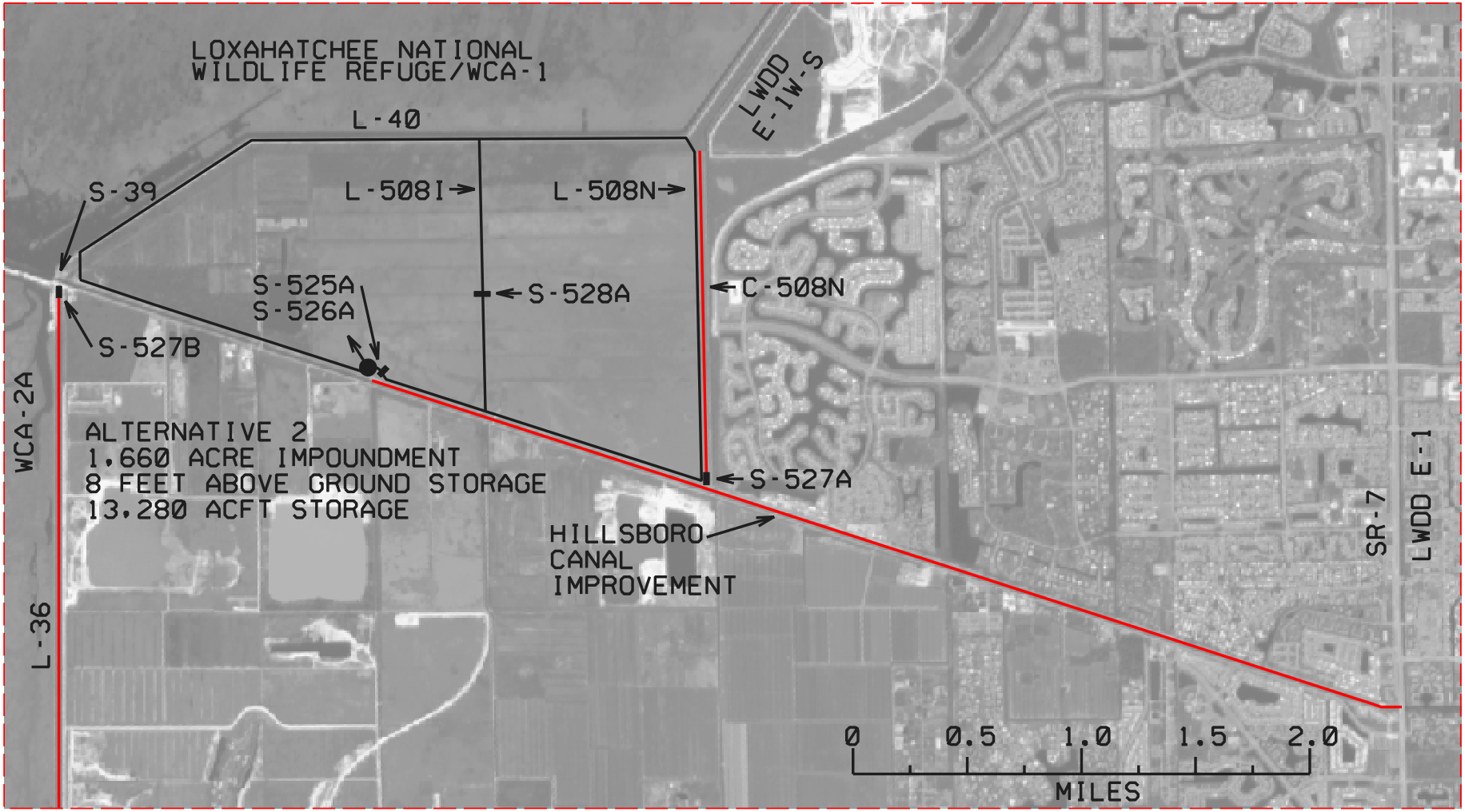


Figure 5-D-6: Site 1 Impoundment Project Site Layout

Hydraulic Design Data for S-367

Description	Design Data
Location	Cell 3 Outlets/Cell 4N Inlets
Static Water Level, Headwater (ft.)	16.25
Structure Geometry	
Inlet Structure Type	Headwall/slide gates
Number of Barrels	1
Barrel Dimension	8’ x 8’ RCB
Culvert Length (ft)	806
Invert Elevation (ft.)	7.00
Outlet Structure Type	Projecting
Number of Structure	5(A,B,C,D&E)
Total Peak Design Discharge (cfs)	1,540
Design Discharge Conditions	
Rating Curve	Figure X
Normal Operation	
Discharge per Structure (cfs)	0-308
Headwater Elev. (ft.)	15.50-19.46
Tailwater Elev. (ft.)	15.00-18.85
Peak Flow	
Discharge per Structure (cfs)	308
Headwater Elev. (ft.)	19.46
Tailwater Elev. (ft.)	18.85

Figure 5-D-7: Example of Structure Description and Operating Criteria Table

Structure 84

Location. S-84 is located on C-41A about 12 miles downstream from S-83 and about a mile upstream from the junction of C-41A with C-38, near Lake Okeechobee.

Purpose. The structure maintains optimum upstream water control stages in Canal 41A; it passes the design flood (30% of the Standard Project Flood) without exceeding the upstream flood design stage and restricts downstream flood stages and channel velocities to non-damaging levels; and it prevents backflow from Lake Okeechobee through C-38 during excessive stages in the lake resulting from floods or wind tides.

Description. The structure is a 2-bay spillway with vertical lift gates and a crest elevation of 13.2 ft., NGVD. It was designed to pass the 30-percent SPF (10-year) discharge of 5,670 cfs at a design headwater and tailwater of 24.5 and 19.3 ft., NGVD, respectively.

Operation. Normal headwater elevation is 25.0 ft., NGVD. Optimum water control is maintained between 24.3 and 25.2 ft., NGVD with automatic gate controls. The automatic controls restrict discharge to design flow by incremented gate openings for inflows greater than design flow.

For more information on this structure refer to the Kissimmee – Lake Istokpoga Water Control Manual.

Figure 5-D-7: Example of Structure Description and Operating Criteria Table (continued)

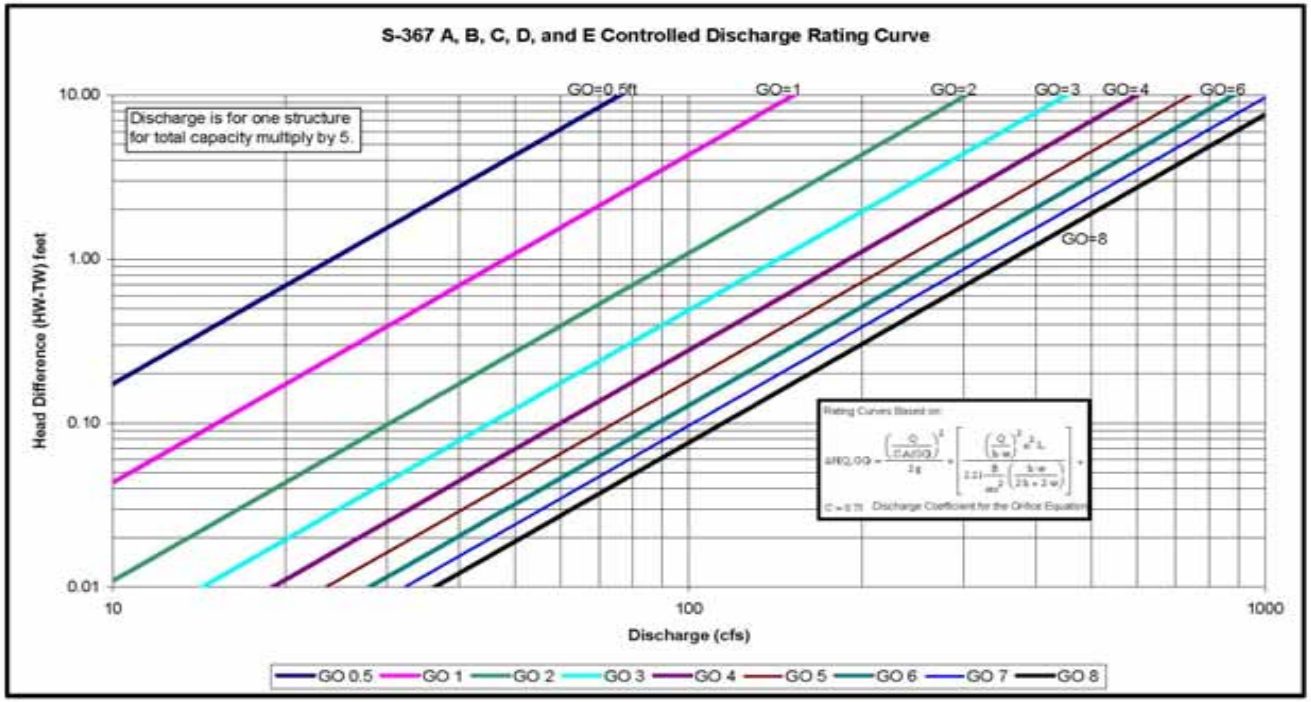


Figure 5-D-8: Example of Structure Rating Curve

SECTION 6: GUIDANCE MEMORANDUM #6
ASSESMENT ACTIVITES FOR ADAPTIVE MANAGEMENT

6.1 PURPOSE

This guidance memorandum provides general direction for the conduct of the adaptive management program and the assessment activities of REstoration COordination, and VERification (RECOVER). RECOVER is a system-wide program of the Comprehensive Everglades Restoration Plan that is responsible for the organization and application of scientific and technical information to ensure that the system-wide goals and purposes of the Plan are achieved. RECOVER is charged with implementing the Plan's assessment activities composed of four basic components: (1) development of a system-wide monitoring program for the South Florida ecosystem; (2) design and implementation of data management and analysis protocols; (3) interpretation of ecosystem responses to the Plan; and (4) identification of opportunities for making changes to the Plan that would improve performance and/or cost-effectiveness.

A critical element of the Plan's adaptive management program is the development and application of a scientifically rigorous assessment program to analyze and understand the responses of the South Florida ecosystem to the implementation of the Plan. This guidance memorandum describes the strategy for conducting credible scientific assessments of the Everglades ecosystem to facilitate understanding of how the Plan is affecting the South Florida ecosystem. Specifically, these assessments address hydrological, biological, ecological, water quality, water supply, and other responses to the Plan. This guidance memorandum does not provide complete guidance on how to conduct assessments. RECOVER is developing a separate document "Assessing the Response of the Everglades Ecosystem to Implementation of the Comprehensive Everglades Restoration Plan" that will provide more complete technical guidance for the conduct of assessments.

WRDA 2000 establishes an integrated framework to ensure that the goals and purposes of the Plan are achieved. Integral to this framework is the establishment of interim goals and interim targets. The establishment of interim goals allows for assessment of progress towards achieving the natural system restoration goals of the Plan and provides a feedback mechanism as ecosystem responses to implementation of the Plan are monitored to ensure that the goals and purposes of the Plan are being achieved. Similarly, establishment of interim targets allows for assessment of progress towards achieving other water-related needs of the region.

6.2 APPLICABILITY

This guidance memorandum applies to all individual projects of CERP as well as to the integration of CERP projects into the comprehensive plan. This guidance memorandum also provides specific direction to RECOVER, particularly the Assessment Team of RECOVER responsible for assessment activities.

6.3 ADAPTIVE MANAGEMENT

6.3.1 Introduction

Development of an adaptive management program is a critical element of CERP. Adaptive management for the Plan is defined in the programmatic regulations as "the continuous process of seeking a better understanding of the natural system and human environment in the South Florida ecosystem, and seeking continuous refinements in and improvements to the Plan to respond to new information resulting from changed or unforeseen circumstances, new scientific and technical information, new or updated modeling; information developed through the assessment principles contained in the Plan; and future authorized changes to the Plan in order to ensure that the goals and purposes of the Plan are fulfilled." The adaptive management program is intended to guide the implementation of the Plan and will be used to assess the responses of the South Florida ecosystem to the Plan and to determine whether these responses match expectations, including expected performance levels.

To address the programmatic regulations' requirement for establishing an adaptive management program, a multi-agency team, has been formed to begin the task of developing an adaptive management implementation strategy for the Plan. The team has organized a series of interagency, management and science collaborative workshops, which have created an Adaptive Management Framework (see Figure 6.1). The Adaptive Management Framework is designed to identify the major components of a comprehensive adaptive management strategy, and show in diagrammatic format how these components link together. The recommended framework currently contains four elements or "boxes" that outline the process for the various components of a comprehensive adaptive management strategy.

Box 1 – Project Development: The goal of this first element is to apply adaptive management principles during the Project Implementation Report process, by anticipating and planning for performance uncertainties, incorporating opportunities for learning into the project design, and incorporating these considerations into project management plans and the final Project Implementation Report during the planning and implementation of Plan projects. The lead responsibility for Box 1 activities is with the Project Delivery Team.

Box 2 – Assessment: This element includes the system-wide assessment process for measuring and reporting actual system responses to the effects of the Plan, including progress towards meeting the interim goals and interim targets. The results of these assessments are provided by RECOVER in technical reports to the USACE and SFWMD in accordance with the programmatic regulations. The assessment process is discussed in detail in this guidance memorandum.

Box 3 – Management and Science Integration: This element is the link of "decision-makers" with scientists in a collaborative review process to produce the assessment report required by the programmatic regulations. This box creates a management and integration team led by the Corps of Engineers and the SFWMD for the purpose of reviewing the technical reports on assessment prepared by RECOVER, and for identifying and evaluating options for resolving any significant performance problems in the Plan. The

management/science team will help produce the assessment report, required by the programmatic regulations, that will describe these options and the potential benefits from each. The management and integration team will include members of RECOVER and management from participating agencies and tribal governments.

Box 4 – CERP Update Process: The final element of the Adaptive Management Framework involves using the assessment report as the basis for selection of the preferred option to either make changes or adjustments in project plans, operations, and/or sequencing of projects, including modification of the Plan or to continue on the present course. The actions in this box occur under the guidance of senior management in the Corps of Engineers and the SFWMD in consultation with other agencies and tribal governments.

6.3.2 Initiating Adaptive Management Activities

There are a number of factors or events that will occur during the implementation of CERP that may trigger the initiation of the adaptive management process to be initiated. This section describes these factors and events.

6.3.2.1 Periodic CERP Updates

The programmatic regulations require that the Plan be evaluated periodically using new or updated modeling, that includes the latest scientific, technical, and planning information. As appropriate, the results of this evaluation may be used to initiate adaptive management activities, such as preparation of a Comprehensive Plan Modification Report, consistent with section 385.32 of the programmatic regulations.

6.3.2.2 Shortfalls in Water Made Available by CERP Projects

In the event that a Plan project does not perform as planned and designed (i.e., there is a "shortfall" in the quantity or quality of water that the project produces), the Corps of Engineers and the South Florida Water Management District will initiate adaptive management activities, including preparation of an assessment by RECOVER (Box 2) as described in this guidance memorandum.

To assist RECOVER in conducting assessment activities, the Project Delivery Team should provide documentation in the PIR (see Guidance Memorandum #1) that describes the identification of water for the natural system and other water-related needs. The Project Delivery Team may prioritize these benefits and reiterate the goals and purposes of the project in order to provide information to decision-makers in their resolution of a shortfall.

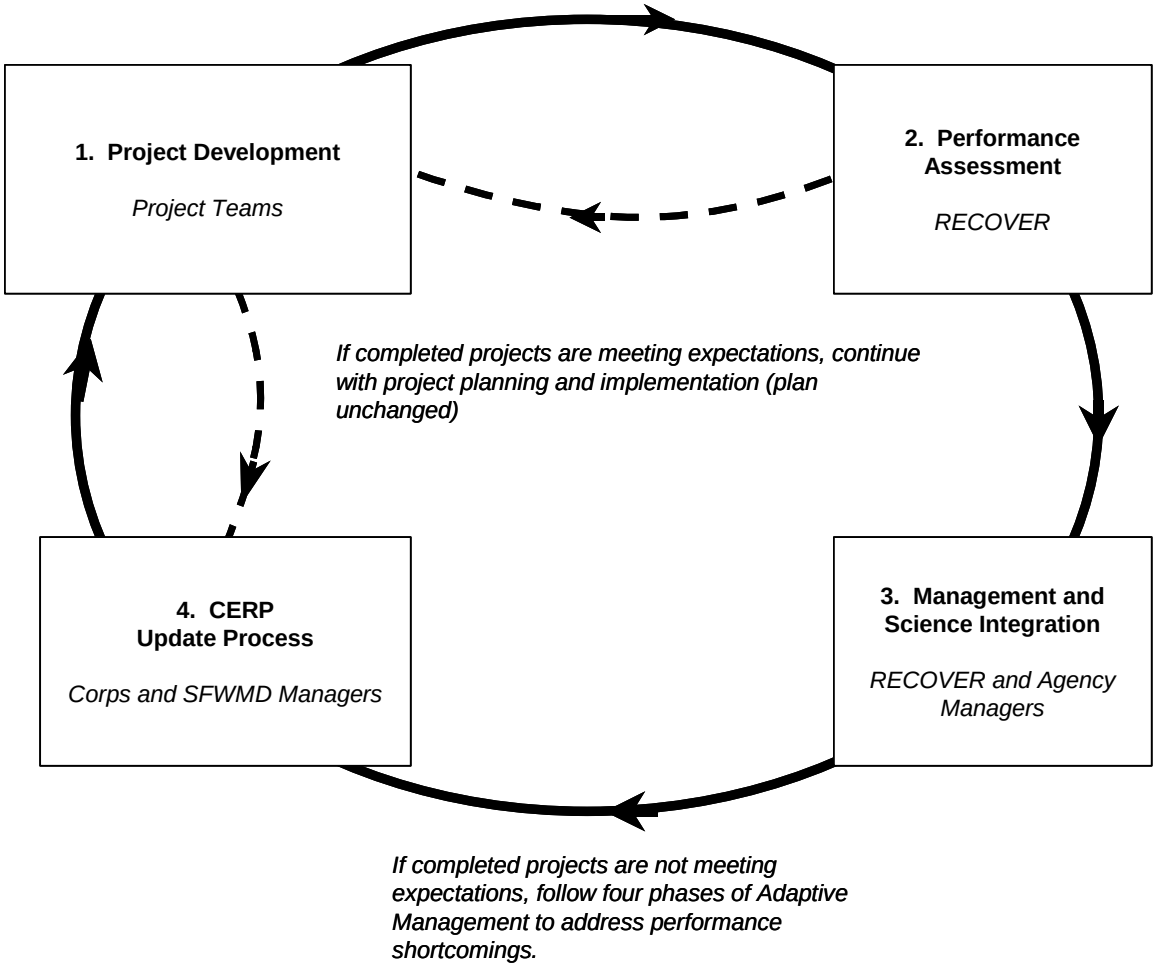


Figure 6-1: CERP Adaptive Management Framework Overview

6.3.2.3 Achievement of Interim Goals and Interim Targets

The interim goals provide a means by which the restoration success of the Plan may be evaluated at specific points throughout the overall planning and implementation process of CERP and are established to facilitate inter-agency planning, monitoring, and assessment. Similarly, the interim targets provide a means by which the Plan's progress towards providing for other water-related needs of the region may be evaluated. If the USACE and SFWMD find that the interim goals or interim targets are not met or are unlikely to be met, then the adaptive management process may be initiated in accordance with the programmatic regulations.

6.3.2.4 Required Periodic Assessments

In accordance with the programmatic regulations, RECOVER is required to prepare a technical report, not any less often than every five years, that presents an assessment of whether the goals and purposes of the Plan are being achieved, including whether the interim

goals and interim targets are being achieved or are likely to be achieved. This guidance memorandum provides detailed instructions for the preparation of the assessment by RECOVER.

6.4 ASSESSMENT ACTIVITIES

6.4.1 Background Information

The programmatic regulations provide authorization for, and requirement of, an adaptive management program to continuously seek a better understanding of the natural system and the human environment in the South Florida ecosystem and to provide a basis for making refinements to the Plan. Adaptive management is a critical element of the Plan as a response to new information to ensure that the goals and purposes of the Plan are fulfilled and that the benefits to the natural system and the human environment are achieved. An essential element of adaptive management is the development and conduct of a scientifically rigorous assessment program to analyze and understand responses of the system to implementation of the Plan. In the context of CERP, the overall adaptive management program includes four basic components and steps (see Figure 6.1). Collectively, these components and steps are necessary to design and implement the system-wide Monitoring and Assessment Plan (MAP), to design and activate a data management and data analyses protocol, to interpret and report system responses, and to identify opportunities for making improvements to the Plan.

The module-level and system-wide assessments of natural and human system responses to the CERP projects will provide the primary basis for conducting an adaptive management strategy. Interpretations of system responses provided by these assessments will be used to identify potential refinements and improvements in the design and operation of the Plan, in the context of the overall adaptive management strategy.

6.4.2 Applied Science Strategy in RECOVER

RECOVER is responsible for the coordination and application of an Applied Science Strategy (Ogden and Davis, 1999) during Plan implementation. This strategy outlines a process for organizing current scientific understanding of wetland and estuarine ecosystems into interrelated components that can effectively support restoration efforts. The major components of the Applied Science Strategy are the development of regional and total system conceptual ecological models, identification of performance measures and targets, development and implementation of a system-wide monitoring program, and development of an assessment strategy. Natural and human system responses will be assessed relative to stated hypotheses for these systems and evaluated relative to the trends or targets established for the Plan through performance measures and objectives outlined in the Monitoring and Assessment Plan (RECOVER, 2004).

6.4.2.1 Conceptual Ecological Models

Conceptual ecological models are the foundation for the development of the majority of performance measures for the natural system (Ogden and Davis, 1999). The conceptual ecological models illustrate the links among societal actions, environmental stressors, and ecological responses (USEPA, 1998) and provide the basis for selection and testing the set of causal hypotheses that best explain how the natural systems in South Florida have been altered (Gentile et al., 2001). Developed as a planning and design tool, conceptual ecological models are used in ecological risk assessment analysis worldwide (Rosen et al., 1995; Gentile et al., 2001) and are one of the major components of the Applied Science Strategy of RECOVER.

The conceptual ecological models, developed for 11 physiographic regions defined in the MAP (RECOVER, 2004) and a total system model (in preparation), provide the scientific basis for development of the CERP system-wide monitoring design and assessment process. The conceptual ecological models are a planning tool for translating the overall restoration goals of the Plan into the specific performance measures that will be used to plan, design, and assess the success of the Plan. In addition to illustrating the ecological links between the physical, chemical and biological elements in specific physiographic regions of South Florida, conceptual ecological models provide the scientific foundation for: (1) developing causal hypotheses linking the most important hydrologic and chemical stressors with the major ecological effects, thus forming the basis for predicting responses to CERP projects and other restoration efforts, and (2) creating sets of measurable indicators of success (e.g., performance measures) as the basis for assessing how well the projects achieve the broad, policy-level goals that have been established for CERP.

6.4.2.2 Performance Measures

Performance measures consist of ecological attributes or environmental stressors (e.g., hydrology, water quality, habitat alteration, etc.) that are indicators of conditions in natural and human systems. Performance measures, developed in large part from the conceptual ecological models, have been integrated into hypotheses at a module scale (see Section 6.4.2.1), which provide a framework for interpreting the system-wide performance of the Plan. Additional performance measures are derived from Federal and State law or policy (e.g., water supply and flood protection). Indicators for the interim goals and interim targets will also be incorporated into the system-wide performance assessment.

RECOVER has defined “assessment” and “evaluation” performance measures. Assessment measures are those that can be directly measured during implementation of MAP components in order to track changes in the state of the natural and human systems. Evaluation measures are used to predict system-wide performance as determined through simulation modeling of the Plan. As understanding of the ecosystem increases, and model development continues, it is expected that an increasing number of performance measures will fall into both categories. Performance measures include hydrology, water quality, biological measures, water supply, and flood protection measures. Some performance measures relate directly to the level of particular stressors (e.g., rate of nutrient input, degree of alteration of salinity, depth of

water), whereas others relate to key attributes of the ecosystem (e.g., fish population size, oyster health, seagrass spatial extent). Achieving the targets (or trajectories towards the targets) of a well-selected set of performance measures is expected to result in system-wide sustainable restoration, as described in the Plan. To optimize the assessment and adaptive management process, a single integrated set of performance measures with both predictive (evaluation) and assessment elements should be considered for RECOVER system-wide tasks including project alternative evaluation, assessments, and the interim goals and interim targets. The application of an integrated set of performance measures fosters clear assessment of targeted system responses and allows project planning to be guided by the same indicators and endpoints as will be used to monitor progress during the implementation of the Plan. Performance measures for CERP are identified in the Plan's System-Wide Performance Measure Documentation Report (RECOVER, in preperation.).

6.4.2.3 MAP Module Groups

The MAP modules represent four geographical regions of the South Florida landscape, with additional modules for hydrology monitoring (to assist in evaluating water supply and flood protection performance measures) and mercury bioaccumulation. They function as the basic organizing elements and research units of the MAP and form the basis for the scientific teams that interpret and analyze monitoring data (RECOVER, 2004). These modules include:

- Greater Everglades Wetlands
- Southern Estuaries (Florida and Biscayne Bays, Southwest Florida Coast)
- Northern Estuaries (St. Lucie Estuary/Southern Indian River Lagoon, Caloosahatchee Estuary, Lake Worth Lagoon, and Loxahatchee River Estuary)
- Lake Okeechobee
- South Florida Hydrology Monitoring (Water Supply and Flood Protection)
- South Florida Mercury Bioaccumulation

The four geographic modules encompass one or more of the conceptual ecological models described above. Each module has its own sampling network designed by a module group, with consideration of compatibility and efficiency that was derived from coordination with the other modules.

Module Groups are teams of scientists and technical experts with expertise in ecology, hydrology, and water quality, and who have experience relative to the natural or human systems described in the MAP modules. They combine the senior scientists of the agencies participating in the development and implementation of the MAP with other leading scientists who are widely recognized in their fields and actively working in South Florida ecosystems.

Each Module Group is led by a member of the RECOVER Assessment Team. Qualifications for a module lead include a long history of experience, accomplishment and responsibility in areas of ecology, hydrology, and water quality relevant to the module.

The core membership of a Module Group includes the Principal Investigators working on the MAP monitoring and research components for that particular module. Contracts between the sponsoring agencies and the MAP Principal Investigators include participation on module teams as part of the work statement. Furthermore, efforts will be made to establish contracts with core members who are deemed to be essential, but who are not directly participating in the implementation of a MAP component.

The Module Groups and associated Principal Investigators are responsible for coordinating the implementation and quality assurance of the MAP monitoring and research projects for each of the modules. Module Groups ensure that implementation of specific monitoring components follows the overall program sequencing developed by the Assessment Team of RECOVER. Module Groups are also responsible for comparing the MAP monitoring data requirements to the non-MAP data already being collected to identify where existing efforts can be incorporated or modified to meet MAP monitoring and assessment guidance criteria.

6.5 GUIDANCE FOR THE CONDUCT OF ASSESSMENT ACTIVITIES OF RECOVER

Assessment activities are organized into three major themes: (1) the efficacy of monitoring components and research activities implemented as part of the system-wide monitoring program, including review of reports from project-level monitoring; (2) the implementation of the Plan in terms of regional and system-wide performance and its progress toward meeting long-term objectives and interim goals and interim targets; and (3) the capture and assessment of additional information that may be subsequently identified as relevant to system-wide responses. General guidance for the process of conducting assessments follows in this guidance memorandum. Specific details about assessment activities may be found in the RECOVER document "Assessing the Response of the Everglades Ecosystem to Implementation of the Comprehensive Everglades Restoration Plan" (RECOVER, in prep.)

The strategy developed for assessing measurable changes in system responses is a multi-step process consisting of monitoring design analysis, data acquisition, data analysis, interpretation, integration, and assessment of system-wide performance. This strategy is designed to address, but is not limited to, the following types of questions: (1) has the indicator changed from its pre-CERP condition; (2) is the change in the desired direction and magnitude; and (3) is the change consistent with expected responses described in the Plan's hypotheses as identified in Section 3 of the MAP, Part 1. This guidance memorandum also addresses the strategy for determining if the measured responses are achieving the interim goals and interim targets established according to Section 385.38 of the programmatic regulations.

A key part of this strategy is determining pre-CERP variability and establishing reference conditions for each of the hydrologic, water quality, and ecological indicators. This document does not provide guidance on establishing baseline conditions for water supply and flood protection. Background variability and spatial patterns will be the emphasis of this effort for the first five years before the implementation of specific Plan projects that are

expected to influence the ecosystem. A fundamental concept underlying the assessment strategy is the ability to detect measurable change of individual and aggregated performance measures. Measurable change is defined as the magnitude and direction of change of a performance measure from the pre-CERP reference condition (i.e., environmental baseline).

Another approach for analyzing trends in ecological systems is to study the changes in the response of ecological attributes along a known stressor gradient (e.g., hydrologic, water quality). This approach may be particularly suited for cases where the temporal extent of a database is not sufficient to detect statistically significant trends and changes beyond the limits of background variability. This methodology, which would incorporate sampling along environmental stressor gradients, can be used to supplement other approaches to evaluate CERP induced changes.

Critical to the success of implementing any assessment is the ability of the sampling designs for the RECOVER MAP, Part I monitoring components to have the power to detect measurable change in hydrologic (including water supply and flood protection), water quality, and ecosystem indicators. The organization of this document attempts to reflect the stepwise scientific process required to detect and measure variability, status and trends in individual performance measures by Principal Investigators. This process is followed by the integration of multiple performance measures at the module level. Finally, some combination of integrating performance across modules and assessment of system-wide hypotheses from the Total System Model will be used to provide a system-wide assessment of hypotheses.

6.5.1 Integrative Assessment Strategy & Process

A multi-step process for detecting and assessing changes in performance measures called the Integrative Assessment Guidance (IAG) process, has been established for assessing progress toward achieving interim goals and interim targets, and evaluating the status of module and system-wide hypotheses (Figure 6.3). The guidance is comprised of three sections. The first addresses assessments at the MAP component level (i.e. specific monitoring and supporting research projects), the second at the module level, and the third at the system-wide level. The assessment process, outlined in Figure 6.2, applies specifically to the natural system and can be modified, as necessary, to address water supply and flood protection.

The assessment activities identified here require a significant commitment of resources and recognition of the inherent logistical challenges associated with the assessment hierarchy that is presented in this guidance memorandum.

When appropriate, revisions to the assessment approach can be made at the Module Group level (with consultation of the RECOVER Assessment Team and the RECOVER Leadership Group). Future revisions will be described in the development and revision of the RECOVER Monitoring and Assessment Plan (MAP), Part 2: Assessment Process.

6.5.1.1 MAP Component-Level

The MAP component-level guidance is directed at the Principal Investigators working within a Module Group. The assessment guidance at the MAP component-level has three parts: (1) estimating the ability to detect change; (2) establishing reference conditions; and (3) measuring changes from reference conditions. At this level, the assessments focus on: (1) selecting the analysis tools necessary to measure the magnitude and direction of change in the performance measures; (2) determining whether changes are consistent with desired trends or targets and MAP hypotheses; and (3) determining if there are indications of unanticipated events that affect desired outcomes.

6.5.1.2 Module Level

Module-level analyses focus on the integration of multiple performance measures in the assessment of specific hypotheses. These module-level analyses cumulate data for trend analysis, and will occur no less frequently than every two years. At this level, Module Groups integrate and interpret the annual reports prepared by each Principal Investigator, evaluate the relevance and utility of non-MAP research for assessment, and integrate the data analysis and interpretation from the RECOVER technical teams. Module-level assessments are conducted to determine the direction and magnitude of change in the integrated performance measures to determine if the changes are consistent with expected responses described in Plan hypotheses. If the trends do not correspond to the expected responses, the Module Groups must provide plausible scientific explanations (Figure 6.2). Finally, the Module Groups will contribute interpretations of progress toward achieving interim goals and interim targets, identify unexpected results, address episodic events, and integrate relevant project-level monitoring.

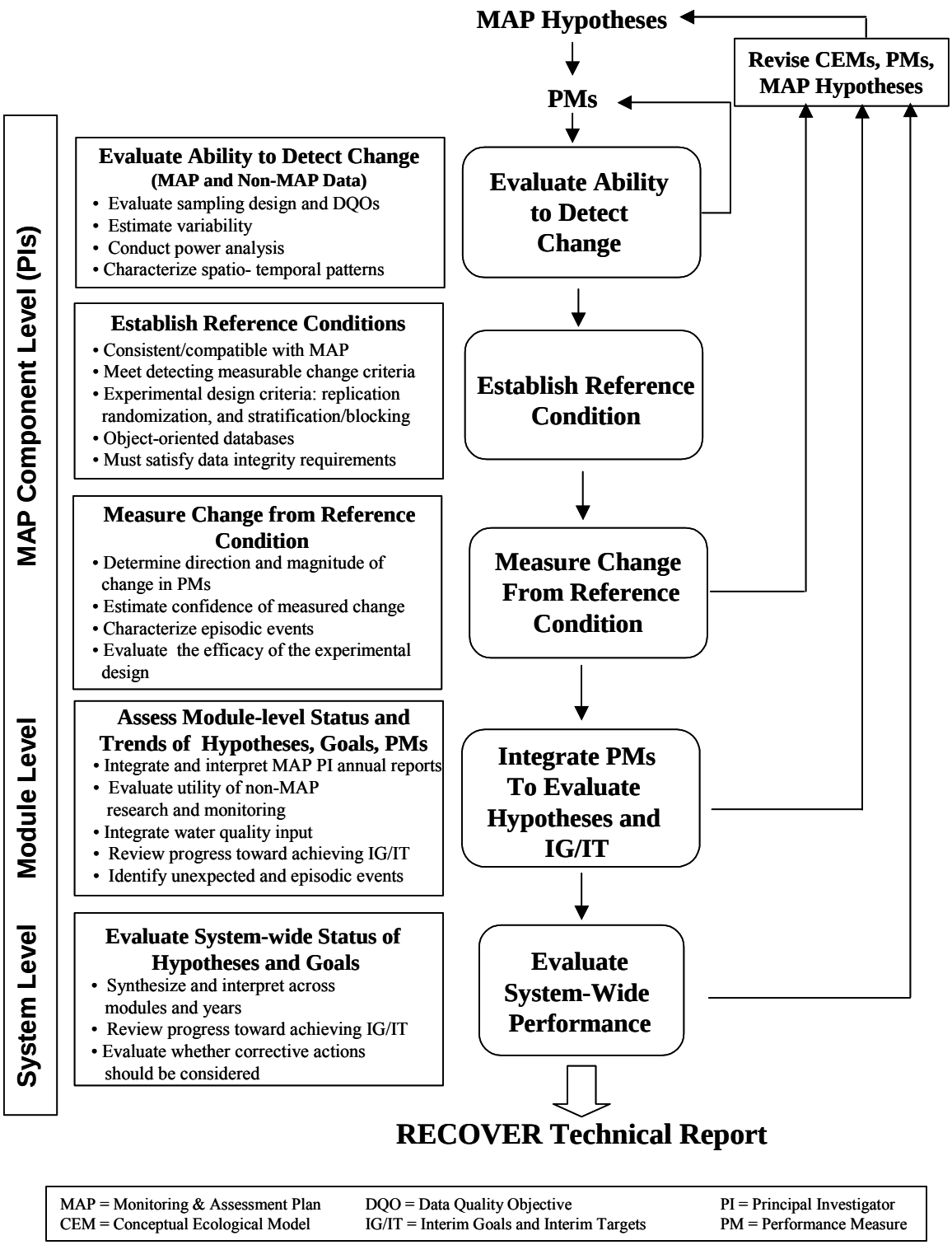


Figure 6-2: MAP Technical Assessment Process

6.5.1.3 System-Wide

System-wide analysis performed by the RECOVER Assessment Team addresses the synthesis of findings across modules and across years to provide a comprehensive description of the status of the system. In addition the RECOVER Assessment Team is currently exploring whether assessment of system-wide hypotheses from the Total System Model can be used as a tool. While the final approach to the system-wide level assessments remains to be clarified, it is important for the integrative assessment process to allow for flexibility and not be too prescriptive or too limiting in the approach at the system-wide level. This assessment will include an evaluation of progress toward achieving system-wide interim goals and interim targets. A summary assessment report is prepared in order to determine whether system responses are consistent or inconsistent with the system-level restoration goals and hypotheses. Assessments will also be conducted to determine whether corrective actions might be necessary to improve performance.

6.5.1.4 Identification of Need for MAP Changes or Adaptive Management Actions

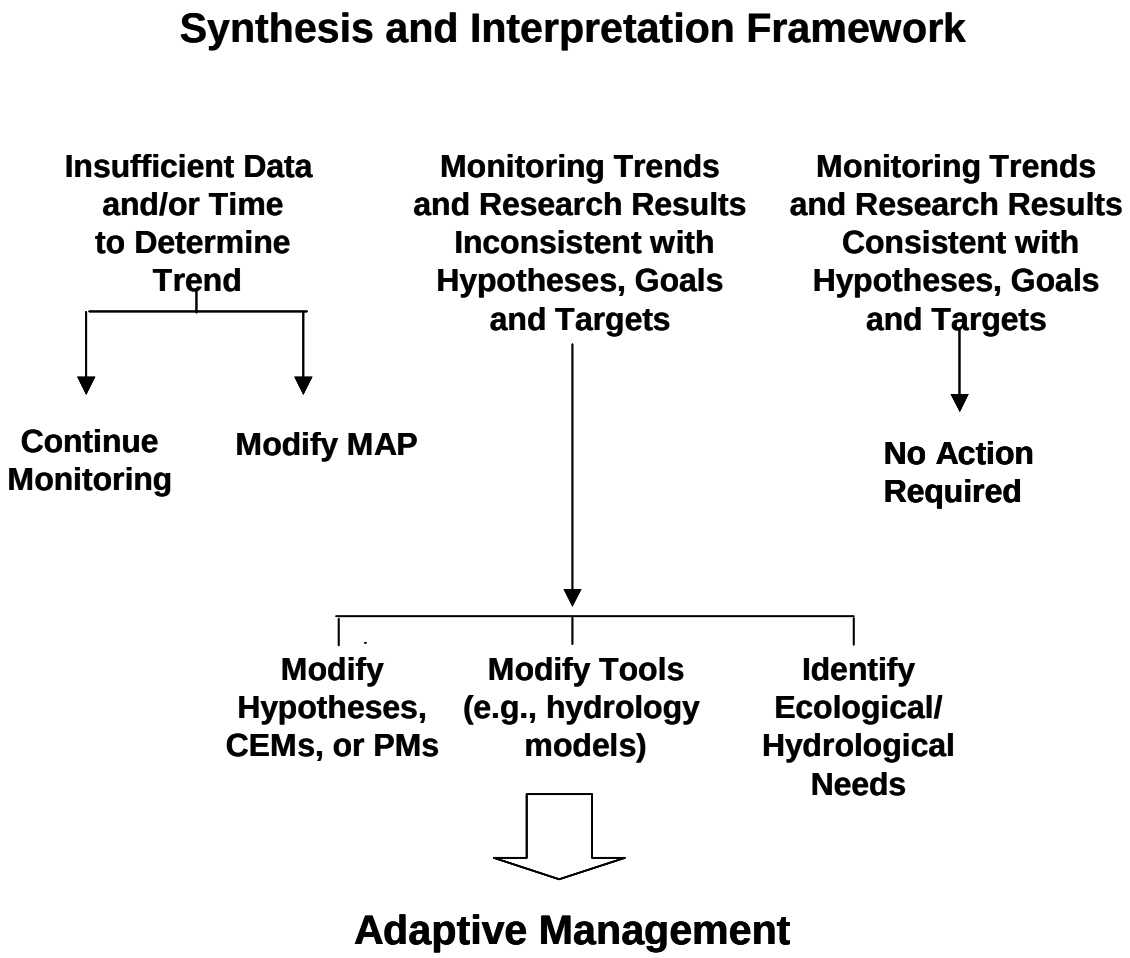
The results from the system-wide analysis may result in the need for the RECOVER Assessment Team to address a suite of options. The intent of this section is to provide guidance on the possible decision alternatives that could result from the assessment of individual or multiple performance measures and MAP hypotheses within and across modules. A fundamental assumption is that this guidance has been applied to analyzing and integrating the performance measures within a module.

There are three plausible alternatives for how to interpret system-wide assessments as illustrated in Figure 6.3. The first alternative recognizes that there was insufficient data or time to determine a pattern or trend. Two possible explanations can be postulated: (1) insufficient time for either the performance measure or the system to respond in a manner allowing for the MAP hypothesis to be critically examined; or (2) the wrong metrics are being measured and reported. In the former case, the monitoring should continue until the performance measure being assessed is able to express itself fully. In the latter case, the option is to modify the MAP.

The second alternative is that the monitoring trends and research results are inconsistent with and/or do not support the hypotheses or the interim goals and interim targets. This could result in the following options: (1) modify the hypotheses, conceptual ecological models and/or the associated performance measures; (2) modify the tools (i.e., hydrologic models); and/or (3) identify system-wide hydrological and/or ecological needs to improve performance of the Plan. This last option would provide the basis for initiating the next phase of the adaptive management process (see Figure 6.1) that addresses alternatives for modifying water management operations and/or the Plan.

In the third alternative, no action is needed because a trend is detected that is consistent with the hypotheses and the interim goals and interim targets.

The RECOVER technical report (see Section 6.6.3) will encompass this interpretation of the system-wide assessment and draw conclusions based on the science. These conclusions may include whether changes to the MAP are needed or if adaptive management actions to improve Plan performance should be considered.



CEM = Conceptual Ecological Model
MAP = Monitoring and Assessment Plan
PM = Performance Measure

Figure 6-3: Decision Framework for Interpreting System-Wide Assessments

6.6 TECHNICAL ASSESSMENT REPORTING FRAMEWORK

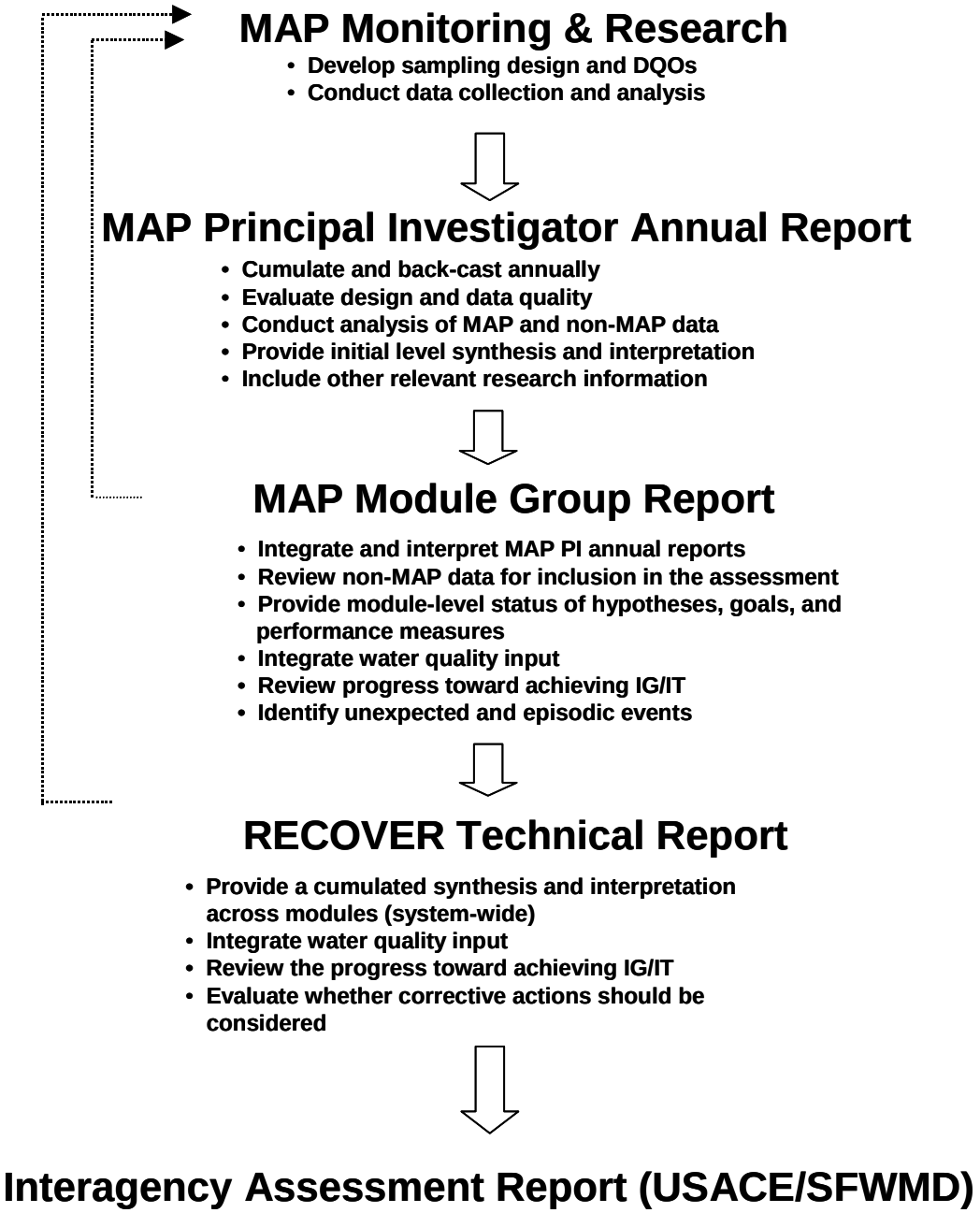
6.6.1 Strategy and Purpose

Monitoring programs often focus on data acquisition with minimum attention to the analysis, synthesis, and interpretation of data specifically for use in the decision process. The Plan's Technical Assessment Reporting Framework (Figure 6.4) places considerable emphasis on the analysis, synthesis and interpretation of the monitoring and research data. Further, the new data that are acquired annually are combined with previous years' trend data to provide a comprehensive and timely synthesis of all the available data. In so doing, this framework assures the early identification of potentially unexpected results and an assessment of the magnitude and direction of change in ecosystem responses, including indicators of interim goals and interim targets and the basic information required to produce the RECOVER Technical Report.

The Technical Assessment Reporting Framework (Figure 6.4) illustrates the process proposed for analyzing, integrating, and interpreting the MAP and other monitoring and research data in a comprehensive, systematic, and logical manner. Two principles underlie this framework: (1) an emphasis on the importance of conducting annual assessments of the monitoring data, and (2) the assumption that the technical foundation for the MAP resides with the Principal Investigators and Module Groups. After having completed several reporting cycles, the timeline will be evaluated based on its ability to: (1) assess the efficacy of the sampling designs; (2) capture trends in system responses; (3) detect unexpected responses; (4) assess progress toward achieving interim goals and interim targets; and (5) determine whether corrective actions need to be considered.

6.6.2 Reporting Framework

The Technical Assessment Reporting Framework identifies two types of reports that contribute to the RECOVER Technical Report: the MAP-Principal Investigator Report and the MAP Module Group Report. The MAP-Principal Investigator Report, prepared by the Principal Investigators, is the first level of the MAP and non-MAP data analysis and interpretation. The Principal Investigators Report will be required annually. This report will cumulate new data annually and combine it with previous years' data to provide a "running" status of the performance measures of interest at the MAP component and module level. Data used in these reports must meet data quality objectives and adhere to Quality Assurance Systems Requirements. In addition, databases used in the reports must comply with data validation and standardization requirements for CERP.



AAT = Adaptive Assessment Team
DQO = Data Quality Objective
IG/IT = Interim Goals and Interim Targets
PI = Principal Investigator

Figure 6-4: Technical Assessment Reporting Framework

Each of the MAP-Principal Investigator Reports for a module will be used in the preparation of the MAP Module Group Report. The objectives of the MAP Module Group Report are to integrate and interpret the information in each of the Principal Investigator Reports, review non-MAP data for its inclusion in the assessment and provide a module-level status of the hypotheses, restoration goals, and performance measures based on a multi-year analysis of trends. This report will also review progress toward achieving module-level interim goals and interim targets. Finally, the integration of all module data will afford the opportunity to identify unexpected or episodic events. The module reports will be prepared no less frequently than every two years.

6.6.3 RECOVER Technical Report

The RECOVER technical report will provide a system-wide integration of all current and past hydrologic, water quality, and ecological data, synthesized across modules. The RECOVER technical report provides an assessment of whether the goals and purposes of the Plan are being achieved, assessing progress towards achieving system-wide interim goals and interim targets, and provides an assessment of system-wide hypotheses. The report will specifically identify those system responses that are inconsistent with the goals and purposes of the Plan, and will evaluate whether corrective actions should be considered based on scientific findings of system-wide or regional ecological needs. In accordance with Section 385.31(b)(4) of the programmatic regulations, the technical report will be prepared at least every five years. However, preparation of RECOVER technical reports more frequent than a five-year interval will occur as appropriate, in response to specific, system-wide technical and scientific issues, the magnitude and frequency of undesirable or unexpected responses, in response to new scientific understandings of the natural systems, and as improved understanding of the rates of ecological responses may influence reporting rates.

6.6.4 Minimum Reporting Guidance

The following is minimum reporting guidance for Principal Investigators, Module Groups, and the RECOVER Assessment Team that parallels the assessment process discussed in this guidance memorandum and Figure 6.3. This minimum reporting guidance applies specifically to the natural system and can be modified, as necessary, to address water supply and flood protection.

A. Evaluate Ability To Detect Change – Principal Investigator Level

- Describe and discuss the results of the power analysis for the sampling design.
- Determine the minimum detectable difference of the power analysis and its associated confidence and uncertainty.
- Describe any suggested changes in the MAP sampling design and its implications for the power analysis and the minimum detectable difference.

B. Establish Reference Condition – Principal Investigator Level

- Describe non-MAP monitoring and research data sources used in the assessment. If non-MAP data were used, did the data meet the criteria outlined in this guidance? If non-MAP data were used and did not meet the guidance criteria, provide a rationale to justify the inclusion of the data.
- Describe how representative the data are in space and time.
- Describe the approaches used to address measuring variability.
- Enter the data into a system-wide data management system.

C. Measure Change From Reference Condition – Principal Investigator Level

- Describe the methods used to estimate the direction and magnitude of change in performance measures from the reference state both annually and cumulatively for multiple years.
- Compare current status of the performance measure with its desired trend or target.
- Evaluate consistency of monitoring results with the MAP hypotheses.
- Determine if there are indications of unanticipated events and describe how they may be affecting the desired outcome.
- External peer review will be conducted as appropriate

D. Integrate Performance Measures To Evaluate Module Hypotheses - Module Group Level

- Integrate multiple performance measures to provide an assessment of module-level hypotheses.
- Describe the direction and magnitude of change in the integrated performance measures and determine if the changes are consistent with expected responses described in the Plan's hypotheses.
- If trends do not correspond to expected responses, provide a probable rationale or explanation for the findings.
- Evaluate progress toward achieving module-level interim goals and interim targets.

E. System-Wide Performance Evaluation – Recover Assessment Technical Team Level

- Synthesize findings across modules and across years to provide a holistic description of the status of the system.
- Evaluate the results in relationship to supporting system-level hypotheses and achieving system-wide interim goals and interim targets.
- Summarize those changes that are consistent with the interim goals and interim targets and hypotheses and those that are not.
- Provide a discussion of why the interim goals and interim targets and hypotheses are not being achieved.

- Provide a discussion of adaptive management issues.
- The system-wide Technical Report will be peer reviewed, consistent with the programmatic regulations and the appropriate CERP guidance on peer review.

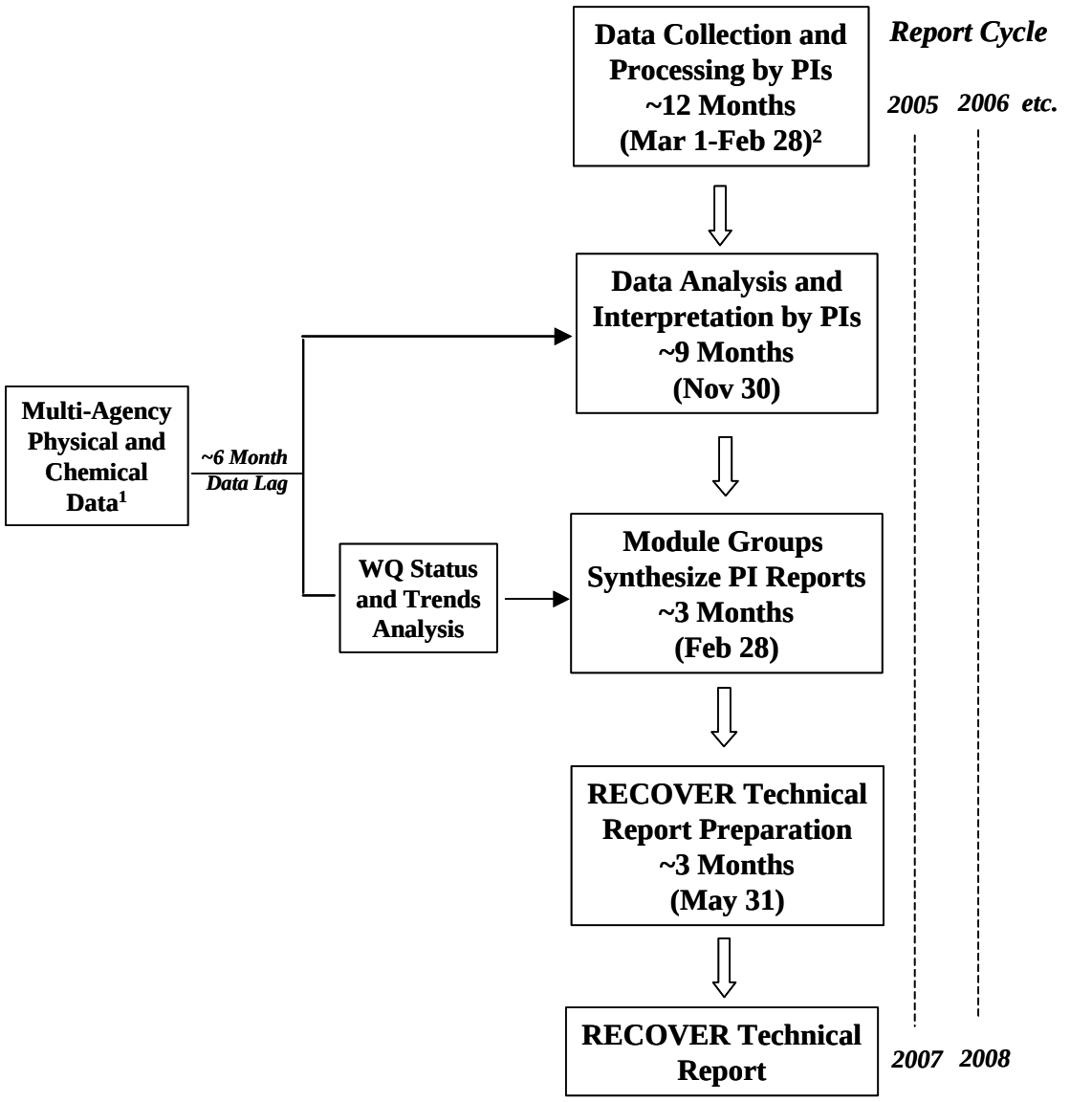
6.6.5 Integrative Assessment Reporting Timeline

The timeline outlined in Figure 6.5 is a framework for the production of reports by MAP Principal Investigators, Module Groups, and the RECOVER Assessment Team. This guidance does not identify fixed reporting dates because of variations in starting times for different MAP Principal Investigator contracts. In the future, it is anticipated that reporting timelines at the MAP Principal Investigator level will become more synchronized. The reporting timelines should follow the date sequence specified for each block in Figure 6.5.

At the MAP Principal Investigator level, data will be collected and processed on an annual basis. After each 12-month data collection/processing period by the MAP Principal Investigators, the Principal Investigators will prepare an analysis and interpretation of their data (MAP Principal Investigator Annual Report). This analysis should be complete within 9 months from the end of the 12-month data collection period. This analysis phase will include incorporation of physical and chemical data where appropriate. Encompassed within the 9-month analysis process is a 6-month time lag in availability of physical and chemical data because of Quality Assurance/Quality Control and data management requirements. At the present time, the time lags in accessing some data sets do not allow the scientists doing the assessments to meet the reporting milestones established in this guidance. In these cases, time lags must be shortened to no more than 6 months in order to meet reporting milestones. Additionally, multi-agency physical and chemical data have inherent issues such as consistent reporting mechanisms, data formatting, and data availability. These issues create constraints on incorporation of physical and chemical data for the MAP analysis that must be resolved.

The individual MAP Principal Investigator Reports are then synthesized at the Module Group level to address the MAP hypotheses. At this point, analysis of the status and trends of water quality (by the RECOVER Assessment Team) will be incorporated into the MAP Module Group Report. It is envisioned that the analysis of hydrology and water quality status and trends will integrate the historical (pre-MAP) databases and the annually acquired MAP databases. The RECOVER Assessment Team can initiate the analysis of historical databases before the MAP Principal Investigator Reports are provided to the Module Groups. The Module Group reports are envisioned to take three months to prepare.

Finally, the RECOVER Technical Report is prepared from the MAP Module Group Reports in a three-month time frame. Overall, there is a 15-18 month time frame for completion of all the reporting steps after a year of data is collected and processed at the MAP Principal Investigator level. For example, for a year of data collected in 2005, the final RECOVER Technical Report on those data is completed in the first half of 2007.



[1] There are multi-Agency data consistency and constraint issues including different reporting mechanisms, data formats, and reporting time frames and requirements.

[2] This reporting timetable has been designed to account for contracting and procurement schedules of the sponsoring agencies. If necessary these dates are subject to modification by the RECOVER Program Managers.

AAT = Adaptive Assessment Team
PI = Principal Investigator
WQ = Water Quality

Figure 6-5: Reporting Timeline

6.7 RESOLVING TECHNICAL DISAGREEMENTS IN THE ASSESSMENT PROCESS

6.7.1 Introduction

Technical disagreements will be addressed in a manner consistent with Section 385.23 of the programmatic regulations. This guidance memorandum recognizes the language provided in Section 385.23(d)(i), which states, "[the] parties will attempt to resolve disputes at the lowest organizational level before seeking to elevate a dispute." This guidance memorandum also affirms that all participants in the assessment process will endeavor at all times to maintain a spirit of cooperation and to settle disagreements through good faith negotiation between or among themselves. Technical disputes raised outside of RECOVER will be addressed in the public review of the RECOVER technical report described in Section 6.6.3 of this guidance memorandum.

There are two categories of technical issues that may arise that need technical resolution: (1) those that may not influence changes in the Plan and (2) those that may influence changes in the Plan. The first is likely resolvable at the lowest level possible, while the second is likely to be addressed at several levels. Here, guidance is provided for a hierarchical approach for resolving technical disagreements.

6.7.2 Process for Resolving Technical Disagreements

One type of technical issue disagreement includes those that may not influence changes in CERP. Examples of these include technical disagreement of issues that may influence the status of the MAP, the conceptual ecological models, MAP hypotheses, and tools used in assessments, etc. Technical dispute resolution for these types of issues is to be addressed initially at the Module Group level. In general, Module Group leads will seek consensus, if not unanimous support, for reports that are provided to the RECOVER Assessment Team. If there are technical disagreements on any major aspect of a given module-level report that cannot be reasonably resolved within the time frame for the preparation of those reports, then the persons in disagreement have the ability to draft a "minority report" section at the end of the report in order to present any alternative viewpoints for RECOVER Assessment Team consideration. To minimize these occurrences, Module Group leads will work closely with those persons to develop a unified resolution. Remaining technical disagreements that the RECOVER technical teams determine do not influence the Plan will be addressed by the RECOVER technical teams in a similar manner. Where appropriate, the RECOVER Assessment Team may request the assistance of other RECOVER teams and the RECOVER Leadership Group as appropriate.

Disagreements over technical issues with potential impacts to changes in the Plan may include technical disagreements over: (1) the interpretation of performance measure monitoring results that may trigger the need for a RECOVER Technical Report or (2) the trajectories of system responses towards interim goals and interim targets. While the final implications of these issues may range from changing the Plan to recognizing the need for additional information and resources to formulate the appropriate assessment, efforts to

resolve these types of technical disagreements will follow a similar approach as described above. In addition, as these issues are critical to understanding to what level they may influence changes in the Plan, the RECOVER technical teams may utilize additional mechanisms for identifying solutions to the technical disagreement. These can include requesting RECOVER Leadership Group guidance and support, or consideration of external peer review to examine the issue from an independent perspective (see Section 6.8 of this guidance). There may be aspects of some technical issues that fall within the domain of other CERP programs or technical teams (i.e., other RECOVER technical teams, RECOVER Leadership Group). It is recognized that these types of technical issues may not be resolved in the time frames established for the preparation of the assessment reporting process. However, all efforts will be applied in preparation of MAP Module Level Reports and the RECOVER Technical Report within the appropriate time frames identified.

6.8 PEER REVIEW OF ASSESSMENT DOCUMENTS

The peer review process enhances the scientific credibility of assessment documents by providing a means for independent experts to offer constructive criticism and scientific and technical advice. Currently, peer review of RECOVER documents is discussed at length in CERP Guidance Memorandum 27.00 and provides an example of guidance for this guidance memorandum. Although the programmatic regulations only specify the necessity of external peer review for the draft assessment report produced by the USACE and the SFWMD, other assessment documents and processes may also benefit from external peer review.

The assessment process is divided into logical progression levels (see Figures 6-1 and 6-3). Peer review should be considered at several of these levels as described below.

6.8.1 Principal Investigator Level

This level of external peer review would primarily consist of that associated with drafted journal articles that relate to completed studies and other research associated with Plan activities. These activities will be identified in individual scopes of work for individual MAP components.

6.8.2 RECOVER Technical Report Level

The RECOVER Technical Report will contain scientific information and interpretations and will potentially present scientifically and technically controversial issues and findings. The process leading to the report involves a large, long-term investment and multiple projects. Therefore, peer review at this level should be consistent with peer review guidance (currently CERP Guidance Memorandum 27.00).

Once completed, the comments, feedback and other information (constructive criticism and scientific and technical advice) resulting from peer review must be adequately considered and documented. This information should be included as an attachment or appendix to the final version of the report. The report should also include a section addressing how the peer

review comments were incorporated, including an explanation and rationale for not incorporating specific suggested changes if this is the case, as well as making any recommendations for inclusion or consideration in following report iterations. The peer reviewers should be included in the distribution list for the report to allow them to see how their comments or input were addressed.

APPENDIX A
GLOSSARY OF TERMS

In addition to terms already defined in the programmatic regulations, the following terms are defined for these guidance memoranda:

Acceler8 means the program of the State of Florida to implement certain features of the Plan using State resources and financing.

Alternative Formulation Briefing means the meeting held to discuss the results of the formulation and evaluation process and to obtain approval of the tentatively selected plan, as described in USACE regulations and policy.

Assessment Report means the report prepared by the USACE and the SFWMD, in consultation with Federal, State, and local agencies and tribal governments, as part of the adaptive management program, in accordance with the programmatic regulations.

Assessment Team means the RECOVER team that is responsible for conducting assessment activities under the adaptive management program.

Beneficial water for the natural system means the water required for the protection of fish and wildlife within natural systems, including water that contributes to meeting hydrologic, water quality, and ecologic targets for restoration of natural systems.

Comparable source means a source that is sufficiently similar to or equivalent to the existing legal source in terms of quantity and quality.

Elimination means the reduction of all or a portion of an existing legal source of water caused by implementation of one or more CERP projects.

Existing Conditions PIR Baseline means the hydrologic conditions in the South Florida ecosystem as modeled by using a multi-year period of record based on assumptions such as land use, population, water demand, water quality and assumed operations of the Central and Southern Florida Project that includes authorized CERP projects with approved operating plans and non-CERP activities with approved operating plans as of the date of the Alternative Formulation Briefing for the PIR.

Existing legal use means a water use that is authorized under a SFWMD or Department of Environmental Protection consumptive use permit under Part II of Chapter 373, Florida Statutes, or is existing and exempt from consumptive use permit requirements under Chapter 373, Florida Statutes, such as domestic uses of water.

Existing legal source means the quantity and quality of water available within a water basin (including seepage, surface water, direct rainfall, and groundwater) used for a water supply,

including the quantity and quality necessary for protection of the source of supply, consistent with State and Federal law, as of December 11, 2000, for:

i) An agricultural or urban water supply;
ii) Allocation or entitlement to the Seminole Indian Tribe of Florida under Section 7 of the Seminole Indian Land Claims Settlement Act of 1987 (25 U.S.C. 1772e);
iii) The Miccosukee Tribe of Indians of Florida;
iv) Water supply for Everglades National Park; or
v) Water supply for fish and wildlife.

Future Without CERP Baseline means the hydrologic conditions in the South Florida ecosystem as modeled by using a multi- year period of record based on assumptions such as land use, population, water demand, water quality, and assumed operations of the Central and Southern Florida Project that includes projected conditions at the end of the period of analysis for the Plan and specifically excludes any CERP projects.

Indicator means an element or component of the natural or human system that is expected to be influenced by the Plan, and has been selected to be monitored as representative of a class of system responses.

Initial Operating Regime means the hydrologic conditions in the South Florida ecosystem at the time that a CERP project becomes operational as modeled by using a multi-year period of record based on assumptions such as land use, population, water demand, and water quality at the end of the period of analysis for the Plan; and assumed operations of the Central and Southern Florida Project that includes authorized CERP projects with approved operating plans and non-CERP activities with approved operating plans as of the date of the Alternative Formulation Briefing for the PIR.

Monitoring and Assessment Plan (MAP) means the plan prepared by RECOVER that describes the system-wide monitoring program to be implemented by RECOVER that is designed to measure status and trends towards achieving the goals and purposes of the Plan and the activities that assess if measured responses are desirable and are achieving the interim goals and interim targets or the expected performance level of the Plan.

MAP Module Group Report means the report prepared by RECOVER that integrates and interprets the information in each of the Principal Investigator reports, reviews non-MAP data for its inclusion in the assessment report and provides a module-level status of the hypotheses, restoration goals, and performance measures based on a multi-year analysis of trends. The MAP Module Group Report also reviews progress at a module-level towards achieving the interim goals and interim targets.

NEPA Analysis Baseline means the hydrologic conditions in the South Florida ecosystem as modeled by using a multi- year period of record based on assumptions such as land use, population, water demand, water quality and assumed operations of the Central and Southern

Florida Project that includes the actual conditions occurring at the time that the PIR is initiated.

Next-Added Increment Baseline means the hydrologic conditions in the South Florida ecosystem as modeled by using a multi- year period of record based on assumptions such as land use, population, water demand, water quality and assumed operations of the Central and Southern Florida Project that includes projected conditions at the end of the period of analysis for the Plan and includes only those CERP projects with approved operating plans as of the date of the Alternative Formulation Briefing for the PIR.

Non-CERP activities means structural or operational changes to the C&SF Project or other water resources systems in the South Florida ecosystem that are not included in the Plan.

Principal Investigator Annual Report means the report prepared annually by Principal Investigators conducting MAP monitoring activities that presents the first level of data analysis and interpretation for a specific MAP component (and relevant additional information). As part of this report, the Principal Investigator will estimate the ability to detect change, establish reference conditions, and measure change from reference condition.

RECOVER System Status Report means that report prepared by RECOVER that provides a synthesis of findings across MAP modules and across years to provide a comprehensive description of the status of the system. This report will include an evaluation of progress toward achieving system-wide interim goals and interim targets to determine whether system responses are consistent or inconsistent with the system-level restoration goals and hypotheses.

Reference Condition means the hydrological, water quality, and/or ecological state of the system or a specific indicator, which encompasses spatial and temporal background variability, prior to implementation of a CERP project that may modify it.

Reservation of water for the natural system means the actions taken by the South Florida Water Management District, the Florida Department of Environmental Protection, or any other State agency or water management district which may be authorized by Florida law, pursuant to the provisions of Section 373.223, F.S., or other applicable State law, to legally reserve water from allocation for consumptive use for the protection of fish and wildlife.

Selected alternative plan means the plan selected by the Corps of Engineers and the non-Federal sponsor for further design and presentation to the public as the result of completing technical analyses of the no-action alternative and other alternative plans formulated and evaluated for a Project Implementation Report.

South Florida Water Management Model (SFWMM) means the regional hydrologic model developed by the SFWMD that is used to simulate hydrologic conditions in the South Florida ecosystem using a multi-year period of record.

Target means a measure of change by an indicator that is expected or desired as the result of implementation of the Plan.

Technical Report means the report prepared by RECOVER as part of the adaptive management program and provided to the Corps of Engineers and the South Florida Water Management District for their use in preparing the assessment report as required by the programmatic regulations. The technical report presents RECOVER's assessment of whether the goals and purposes of the Plan are being achieved, including whether the interim goals and interim targets are being achieved or are likely to be achieved.

Transfer means the sending of all or a significant portion of an existing legal source of water from its original location to another location within the South Florida ecosystem caused by implementation of one or more Plan projects.

Volume-probability curve means the curve that plots the estimate of quantities of water produced in one or more water basins (usually expressed as acre-feet or million/billon gallons) as a function of the percentage of time the quantity is equaled or exceeded. It describes, in a graphical form, the water quantities that may be expected in one or more water basins for a range of hydrologic conditions as a result of a set of assumed conditions, projects, and operations.

Water basins means the major hydrologic regions that comprise the South Florida ecosystem.

Water shortage means the situation when insufficient water is available to meet the present and anticipated needs of the users, or when conditions are such as to require temporary reduction in total use within a particular area to protect water resources from serious harm. A water shortage typically occurs due to drought conditions.

APPENDIX B
ACRONYM LIST

AFB	Alternative Formulation Briefing
ASA(CW)	Assistant Secretary of the Army(Civil Works)
CERP	Comprehensive Everglades Restoration Plan
CE/ICA	Cost Effectiveness/Incremental Cost Analysis
C&SF	Central and Southern Florida
DCP	Drought Contingency Plan
DE	District Engineer
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EA	Environmental Assessment
EM	Engineering Manual
ER	Engineering Regulation
FDEP	Florida Department of Environmental Protection
F.S.	Florida Statutes
FSM	Feasibility Scoping Meeting
FWC	Florida Fish and Wildlife Conservation Commission
FWS	[United States] Fish and Wildlife Service
GM	Guidance Memorandum[a]
HQ	Headquarters
ICA	Incremental Cost Analysis
IPR	In-Progress Review
LERRD	Lands, easements, rights-of-way, relocations, and disposal areas
MAP	Monitoring and Assessment Plan
M-CACES	Micro-Computer Aided Cost Engineering System
MPMP	Master Program Management Plan
NAI	Next-added increment
NED	National Economic Development
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OASA(CW)	Office of the Assistant Secretary of the Army (Civil Works)
OMRR&R	Operation, Maintenance, Repair, Rehabilitation, and Replacement
OTMP	Operational Testing and Monitoring Phase
PIR	Project Implementation Report
POM	Project Operating Manual
RECOVER	REstoration COordination and VERification
SAD	South Atlantic Division
SAJ	South Atlantic—Jacksonville [District]
SFWMD	South Florida Water Management District
SFWMM	South Florida Water Management Model

SOM	System Operating Manual
SPF	Standard Project Flood
SPS	Standard Project Storm
USACE	United States Army Corps of Engineers
WCDSAP	Water Control Data Acquisition System Plan
WCDS	Water Control Data System
WCM	Water Control Manual
WRDA	Water Resources Development Act
WQC	Water Control Certification

APPENDIX C
LIST OF REFERENCES

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