South Florida Water Management District

Florida Forever Work Plan

December 13, 2001

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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December 20, 2001

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President of the Senate
Suite 409, The Capital
404 S. Monroe Street
Tallahassee, FL 32399-1100

The Honorable Tom Feeney
Speaker of the House of Representatives
Suite 420, The Capital
402 S. Monroe Street
Tallahassee, FL 32399-1300

Secretary David B. Struhs
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 10
Tallahassee, FL 32399-3000

Dear Senator McKay, Speaker Feeney and Secretary Struhs:

We are pleased to provide the President of the Senate, Speaker of the House of Representatives and Secretary of the Department of Environmental Protection with the first update of the South Florida Water Management District (District) Florida Forever Work Plan. This document, which covers the fiscal years 2002 – 2006, satisfies the reporting requirements of Section 373.199, Florida Statutes. This report is also available to the public through our Internet web site and our normal document distribution process.

In accordance with Section 373.139(3), F.S., the Governing Board adopted the five-year work plan after a public hearing on December 13, 2001. The District provided at least fourteen days advance notice of the hearing date and separately notified each county commission within our boundaries.

The District's Florida Forever Work Plan is centered on the implementation of the Comprehensive Everglades Restoration Plan (CERP), since 75% of the District's share of Florida Forever funding is dedicated to its implementation. The work plan describes specific projects that will be eligible for Florida Forever funding during this period.

If you have any questions regarding this plan or the District's implementation of the Florida Forever program, you may contact Blair LittleJohn, Deputy Department Director for Land Acquisition.

Sincerely,

Henry Dean
Executive Director

c: Blair LittleJohn

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South Florida Water Management District

Florida Forever Work Plan

November 2001

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EXECUTIVE SUMMARY

In 1999, the Florida Forever program was created, which authorized the issuance of bonds in an amount not to exceed $3 billion for acquisitions of land and water areas. This revenue is to be used for the purposes of restoration, conservation, recreation, water resource development, historical preservation and capital improvements to such land and water areas. This program is intended to accomplish environmental restoration, enhance public access and recreational enjoyment, promote long-term management goals, and facilitate water resource development.

The requirements for developing The Florida Forever Water Management District Work Plan are contained in Section (s.) 373.199, Florida Statutes (F.S). The provision states that the water management districts are to create a five-year plan that identifies projects meeting specific criteria. In developing their project lists, each district is to integrate its surface water improvement and management plans, Save Our Rivers (SOR) land acquisition lists, stormwater management projects, proposed water resource development projects, proposed water body restoration projects, and other properties or activities that would assist in meeting the goals of Florida Forever.

The initial plan was submitted on June 1, 2001 to the President of the Senate, Speaker of the House of Representatives, and Secretary of the Department of Environmental Protection (FDEP). In this first update, due by January 1, 2002 and each year thereafter, the District is to submit a report of acquisitions completed during the year together with modifications or additions to its five-year work plan. The plans will also include the status of funding, staffing and resource management for every project funded for which the District is responsible.

Thirty-five percent of the Florida Forever bond proceeds are distributed annually to FDEP for land acquisition and capital expenditures in order to implement the priority lists submitted by the water management districts. A minimum of 50 percent of the funding is to be used for land acquisition. The South Florida Water Management District (SFWMD) annual net share is $33,075,000. The Everglades Restoration Investment Act, s. 373.470(5)(b), F.S., mandates that for ten consecutive years, $25M of this funding is to be used to implement the Comprehensive Everglades Restoration Plan (CERP). The remaining $8M per year will be spent on the Kissimmee River Restoration Project. Since approximately 75 percent of the Florida Forever funding that the SFWMD will receive will be dedicated to CERP, it is a major focus of the SFWMD Florida Forever Workplan.

This work plan describes specific projects that will be eligible for Florida Forever funding in the FY2002 – 2006 period. This discussion is arranged in sections that correspond to the regions as described in the August 2000 CERP Master Program Management Plan (MPMP). Additionally, projects for which the SFWMD expects to seek reimbursement through Florida Forever in fiscal year 2002 are each explained in detail, consistent with s. 373.199(4), (5), F.S. These twelve projects are listed in the five-year expenditures schedule (**Figure 1**).

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LIST OF ABBREVIATIONS AND ACRONYMS

AC-FT	acre-feet
ARC	Acquisition and Restoration Council
ASR	Aquifer Storage and Recovery
BCNP	Big Cypress National Preserve
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BOR	Basis of Review
CARL	Conservation and Recreation Lands
C&SF Project	Central and Southern Florida Flood Control Project
CERP	Comprehensive Everglades Restoration Plan
CREW	Corkscrew Regional Ecosystem Watershed
CUP	Consumptive Use Permit
CWA	Clean Water Act
DACS	Department of Agricultural Services
District	South Florida Water Management District
DOF	Division on Forestry
EAA	Everglades Agricultural Area
ECB	East Coast Buffer
EEL	Environmentally Endangered Lands
EIS	Environmental Impact Statement
EOC	Emergency Operations Center
ERP	Environmental Resource Permit
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FCD	Central and Southern Florida Flood Control District
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FEMA	Federal Emergency Management Agency
FFA	Florida Forever Act
FFAC	Florida Forever Advisory Council

FFWCC	Florida Fish and Wildlife Conservation Commission (*now known as FWC*)
FGFWFC	Florida Game and Freshwater Fish Commission
FGS	Florida Geological Survey
FDHRS	Florida Department of Health and Rehabilitative Services (*now known as FDOH*)
FPFDD	Fort Pierce Farms Drainage District
F.S.	Florida Statutes
FWC	Florida Fish and Wildlife Conservation Commission
FY	Fiscal Year
GCSSF	Governor's Commission for a Sustainable South Florida
GIS	Geographic Information System
GPD	gallons per day
GPM	gallons per minute
IAS	Intermediate Aquifer System
IFAS	Institute of Food and Agricultural Sciences
KICCO	Kissimmee Island Cattle Company
KRR	Kissimmee River Restoration
LFA	Lower Floridan Aquifer
LMD	Land Management Department
MCL	Maximum Contaminant Level
MFLs	Minimum Flows and Levels
mg/L	milligrams per liter
MGD	million gallons per day
MGY	million gallons per year
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPMP	Master Program Management Plan
MS4	Municipal Separate Sewer System
NGVD	National Geodetic Vertical Datum
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NSLRDD	North St. Lucie River Drainage District

NWI	National Wetland Inventory
NWR	National Wildlife Refuge
ORV	Off-Road Vehicle
O&M	Operations and Maintenance
P2000	Preservation 2000
PCA	Project Cost Agreement
PLRG	Pollution Loading Reduction Goals
PWS	Public Water Supply
RAA	Restricted Allocation Area
Restudy	Central and Southern Florida Flood Control Project Comprehensive Review Study
RO	Reverse Osmosis
RTA	Reduced Threshold Areas
SAS	Surficial Aquifer System
SCG	Sugarcane Growers
SDWA	Safe Drinking Water Act
SFWMD	South Florida Water Management District
SFWMM	South Florida Water Management Model
SJRWMD	St. Johns River Water Management District
SOE	Save Our Everglades
SOR	Save Our Rivers
SOW	Statement of Work
SPF	Standard Project Flood
SR	State Road
STA	Stormwater Treatment Area
SWCD	Soil and Water Conservation District
SWIM	Surface Water Improvement Management
TCRPC	Treasure Coast Regional Planning Council
TDS	Total Dissolved Solids
TIITF	Trustees of the Internal Improvement Trust Fund
TMDL	Total Maximum Daily Load
UFA	Upper Floridan Aquifer
UIC	Underground Injection Control
UDB	Urban Development Boundary
U.S.	United States

USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCA	Water Conservation Area
WHPA	Wellhead Protection Area
WMLTF	Water Management Lands Trust Fund
WPA	Water Preserve/Management Area
WQC	Water Quality Certification
WRCA	Water Resource Caution Area
WRDA	Water Resources Development Act

Chapter 1
INTRODUCTION

LEGISLATION (FLORIDA FOREVER AND COMPREHENSIVE EVERGLADES RESTORATION PLAN)

Florida Forever Program

In 1999, the Florida Forever program was created, which authorized the issuance of bonds in an amount not to exceed $3 billion for acquisitions of land and water areas. This revenue is to be used for the purposes of restoration, conservation, recreation, water resource development, historical preservation and capital improvements to such land and water areas. This program is intended to accomplish environmental restoration, enhance public access and recreational enjoyment, promote long-term management goals, and facilitate water resource development.

Morever, this legislation sets forth numerous other substantive provisions, including those relating to: sovereignty of submerged land leases; use and management of state-owned lands; sale of surplus state lands; use of funds within the Conservation and Recreation Lands (CARL) and Water Management Lands Trust Funds; payment in lieu of taxes; the Florida Forever Advisory Council (FFAC); the Acquisition and Restoration Council (ARC); procedures and guidelines for land acquisition and less than fee land acquisition alternatives; and the Florida Greenways and Trails Council. In addition, this measure sets forth the criteria for the water management districts to evaluate and recommend projects and financial assistance funding programs to local governments. The provision also provides rulemaking authority to the Florida Department of Environmental Protection (FDEP) and the water management districts for implementation of the Florida Forever Act. This legislation has significant fiscal impacts on state and local governments and took effect on July 1, 1999.

The Florida Forever Act

The Florida Forever Act was created in Section (s.) 259.105, Florida Statutes (F.S.). This section sets forth the legislative findings, declarations and intent of the Florida Forever Act, such as:

- Endorsing the Preservation 2000 (P2000) program
- Recognizing the degradation of water resources in this state
- Committing to protect, restore, and preserve lands and water areas
- Providing access to public lands as important
- Providing that acquisition should be based upon an assessment of natural resources

- Changing the direction and focus of the land acquisition program to extend bonding and financing capabilities
- Stating that the bond proceeds are to be used to implement the goals and objectives developed by ARC

The Florida Forever Act also provides that bond proceeds are to be distributed annually as follows:

- 35 percent ($105 million) to the FDEP for land acquisition and capital expenditures in order to implement the priority lists submitted by the water management districts. A minimum of 50 percent of these funds shall be used for the land acquisitions.
- 35 percent ($105 million) to the FDEP for land acquisition and capital expenditures pursuant to this section. Of these proceeds, a priority is to be given to acquisitions that achieve a combination of conservation goals including protecting Florida's water resources and natural ground water recharge. Capital expenditures are not to exceed 10 percent of these funds.
- 22 percent ($72 million) to the Department of Community Affairs to provide grants to local governments through the Florida Communities Trust. From these funds, 8 percent are to be transferred annually to the Land Acquisition Trust Fund for grants awarded under the Florida Recreation Development Assistance Program in s. 375.075, F.S. 75 percent of the funds that are used for land acquisition and are available to the trust are to matched by local governments on a dollar for dollar basis. 30 percent of the total trust funds are to be used in Standard Metropolitan Statistical Areas, but one-half of the amount is to be used in localities in which the project site is located in built-up commercial, industrial or mixed-use areas and functions to intersperse open spaces within congested urban core areas. No less than 5 percent of the funds allocated to the trust are to be used to acquire lands for recreational trail systems. If the full 5 percent is not used, such funds may be expended for other purposes authorized by this section.
- 1.5 percent ($4.5 million) to each of the following: FDEP for the purchase of inholdings and additions to state parks under the jurisdiction of the Division of Recreation and Parks; the Division of Forestry (DOF) at DACS to fund acquisitions and inholdings and additions pursuant to this section, along with reforestation plans or sustainable forestry management; the Fish and Wildlife Conservation Commission to fund acquisitions and inholdings and additions to land to further the conservation of fish and wildlife; the Florida Greenways and Trails Program to acquire

> greenways and trails, including railroad rights-of-way and the Florida National Scenic Trail.

All lands acquired pursuant to this section are to be used for "multiple-use" purposes. "Multiple-use" includes: outdoor recreational activities pursuant to s. 253.034 and s. 259.032(9)(b), F.S., water resource development projects, and sustainable forestry management. Water resource or water supply projects may be allowed only if the following specified conditions are met: minimum flows and levels (MFLs) have been established for those waters which may incur significant harm to water resources, the project complies with permitting requirements, and the project is consistent with the regional water supply plan. The entity which vests title in the lands may designate the lands as single use.

Funding under the two 35 percent provisions mentioned above, is contingent upon the project contributing to the achievement of certain specified goals. Out of the first 35 percent ($105 million) funding provision mentioned above, the Secretary of FDEP is to ensure that each water management district receives the following percentage of funds: 35 percent ($36.75 million) to the South Florida Water Management District (SFWMD); 25 percent to the Southwest Florida Water Management District; 25 percent to the St. John's River Water Management District; 7.5 percent to the Suwannee River Water Management District; and 7.5 percent to the Northwest Florida Water Management District. An increased priority will be given to such projects that have secured a cost-sharing agreement allocating for the cleanup of point and nonpoint sources of pollution.

According to s. 259.105(3) of the Florida Forever Act, the amount is reduced by the costs of issuing and funding reserve accounts and other expenses associated with bonds. The proceeds of the bonds are to be deposited into the Florida Forever Trust Fund. Based on historical patterns associated with the P2000 program, District staff have estimated the costs to be approximately 10 percent.

Under the second 35 percent funding provision mentioned above, ARC accepted applications for eligible project proposals beginning July 1, 2000. Project applications are to contain a minimum of two numeric performance measures that relate directly to overall goals and proof that owners within the acquisition area have been notified of their inclusion in the project. ARC was allowed to use existing rules adopted by the board of trustees, until amendments to those rules are developed to competitively evaluate, select, and rank projects for Florida Forever funds pursuant to s. 259.105(3)(b). This was to begin no later than May 1, 2001. In developing or amending the rules, the council is to give weight to the criteria included in s. 259.105(10). The board of trustees are to review the recommendations and adopt rules necessary for the administration of the process. ARC is to review that year's approved project lists and by the first board meeting in May, the council is to submit the lists to the board of trustees. ARC is also required to submit to the board of trustees, with its project list, a report containing certain specified information regarding each project listed.

Under the remaining funding provisions mentioned above, the agencies are to develop their individual acquisition and restoration lists. Proposed additions may be

acquired if they are within the original project boundary, management plan, or management prospectus. Proposed additions that do not meet these requirements may be submitted to ARC for approval if the additions meet two or more of the criteria listed (e.g., serves as a link or corridor to other publicly owned property or enhances the protection or management of the property).

The board of trustees or water management district may authorize the granting of a lease, easement, or license for the use of certain lands. Particular uses are to be reviewed by the appropriate board and shall be compatible with resource values and management objectives for the land.

The Florida Forever Act allows the board of trustees to allow lands identified or acquired under the program to be managed by a private entity in accordance with a contractual arrangement with the acquiring agency. Funding for these contracts may only originate from the documentary stamp tax revenues deposited into the CARL Trust Fund and the Water Management District Lands Trust Fund.

Save Our Everglades (SOE) Trust Fund

The Save Our Everglades (SOE) Trust Fund was created by FDEP from s. 373.472. Funds in the trust fund, which is to serve as a repository for state, local and federal project contributions, are to be expended to finance the implementation of the comprehensive plan, as defined in s. 373.470(2)(a). For each of the nine consecutive years beginning with fiscal year 2001-2002, $100 million of state funds are to be deposited into the trust fund ($25 million of which is committed from the Florida Forever program). The Comprehensive Everglades Restoration Plan (CERP) annual report, submitted jointly by the District and FDEP, describes the funding, expenditures and implementation status of the comprehensive plan.

According to the Everglades Restoration Investment Act (s. 373.470(5)(b), for each year of the ten consecutive years beginning with fiscal year 2000-2001, FDEP is to deposit $25 million of the funds allocated to the District by FDEP for the purpose of funding Florida Forever projects (s.259.105(11)) into the SOE Trust Fund.

The Secretary of FDEP is to release monies within thirty days after receipt of a resolution adopted by the District's governing board which identifies and justifies preacquisition costs necessary for the purchase of any lands listed in the District's 5-year workplan. All funds not used for the purposes in the resolution are to be returned to FDEP. Similarly, the Secretary of FDEP is to release acquisition monies to the District after receipt of a resolution adopted by the governing board.

Comprehensive Everglades Restoration Plan (CERP)

The South Florida ecosystem is in serious ecological decline, having been severely impacted by human activities for over a hundred years. The Central and Southern Florida Project (C&SF Project) Comprehensive Review Study, Final Integrated Feasibility Report

and Programmatic Environmental Impact Statement (USACE and SFWMD, 1999) is the framework and guide for the $7.8 billion plan for the restoration, protection, and preservation of the water resources of the central and southern Florida ecosystem. It also provides for other water-related needs of the region such as water supply and flood protection. The comprehensive plan includes over 60 projects/separable elements that involve either structural or operational changes to modify the C&SF Project. These projects will increase storage and water supply for the natural system, as well as for urban and agricultural needs. The goals are to restore the quantity, quality, timing, and distribution of water.

The recommended Comprehensive Plan identifies and discusses the plan's proposed project components, its beneficial effects, and potential impacts on existing resources. The basic approach to the plan is to capture most of the 1.7 billion gallons of water per day that on average is discharged through project canals to the ocean and the gulf. Principal features of the plan are the creation of approximately 217,900 acres of new reservoirs and wetland-based water treatment areas. These components increase the dynamic storage capability and water supply for the natural system, as well as for urban and agricultural needs, while maintaining current the C&SF Project purposes.

Implementation of the Comprehensive Plan will achieve the restoration of more natural flows of water, including sheetflow, improved water quality, and more natural hydroperiods in the South Florida ecosystem. It is predicted that native flora and fauna, including threatened and endangered species, will rebound as a result of the restoration of hydrologic conditions. It is also predicted that the frequency of water restrictions for agricultural and urban users will be significantly reduced. The ability to sustain the region's natural resources, economy, and quality of life depends, to a great extent, on the success of the efforts to enhance, protect, and better manage the regions water resources.

Florida Forever Water Management District Work Plan

The requirements for developing the Florida Forever Water Management District Work Plan are contained in s. 373.199, F.S. This provision states that in order to further the goals of the Florida Forever Act, the water management districts are to create a five-year plan which identifies projects that meet certain criteria.

In developing their project lists, each water management district is to integrate its surface water improvement and management plans, Save Our Rivers (SOR) land acquisition lists, stormwater management projects, proposed water resource development projects, proposed water body restoration projects, and other properties or activities that would assist in meeting the goals of Florida Forever.

The districts' lists are to include, where applicable, specific information for each project, according to s. 373.199(4),(5), F.S., including: a description of the water body system; an identification of all governmental agencies having jurisdiction over the water body; a description of the land uses within the project area's drainage basin; a description of strategies for restoring the water body; a listing and synopsis of studies; a description

of measures needed to maintain the water body once it has been restored; a schedule for restoration; an estimate of the funding needed to carry out the project; numeric performance measures; a discussion of permitting and regulatory issues; an identification of the proposed public access for projects with land acquisition components; an identification of lands requiring a full fee simple interest; and an identification of lands necessary to protect or recharge ground water. The lists are also to indicate the relative significance of each project, the schedule of activities, the sums of monies earmarked, and rankings as much as possible over a five-year planning period.

The initial plan was submitted on June 1, 2001 to the President of the Senate, Speaker of the House of Representatives and Secretary of the FDEP. The initial five-year work plan and any subsequent modifications are to be adopted by each water management district after a public hearing, in accordance with s. 373.139(3), F.S. Each district is to provide at least fourteen days advance notice of the hearing date and is to separately notify each county commission within which a proposed work plan project, project modification or addition is located of the hearing date.

In the first plan update, due by January 1, 2002, and each year thereafter, the district is to submit a report of acquisitions completed during the year together with modifications or additions to its five-year work plan. The plans are to also include the status of funding, staffing and resource management for every project funded under the Florida Preservation 2000 Act, the Florida Forever Act, and the Water Management Lands Trust Fund (s. 259.101, 259.105, and s. 373.59, F.S.), for which the district is responsible. Also included in the report is a description of land management activity for each project owned by the district. These new reporting requirements are included in the appendices section (**Appendix C** on the attached CD-ROM). The Secretary is to submit this report along with the ARC project list as required under s. 259.105, F.S.

The District's Florida Forever Work Plan is centered on the ten volume, 4,033 page Comprehensive Review Study, due to the fact that approximately 75 percent of the Florida Forever funding that the District will receive in order to accomplish its priority list has been allocated by the Everglades Restoration Investment Act to implement the Comprehensive Plan. The work plan document is arranged in sections providing detail on each of the regions that comprise the nearly 18,000 square miles of the study area. The CERP Master Program Management Plan (MPMP) (USACE and SFWMD, 2000) identifies the following regions within the study area:

1. Kissimmee River and Lake Okeechobee Region
2. Caloosahatchee River/Southwest Florida Region
3. Upper East Coast Region
4. Everglades Agricultural Area (EAA)
5. Big Cypress Region
6. Water Conservation Areas (WCAs) and Everglades Region
7. Lower East Coast Region

8. Florida Bay and Keys Region

The work plan addresses the information requirements listed in the statute for the District's project list, primarily by study region. The Comprehensive Plan describes this information through applicable subsections described by the following:

1. Physical Condition
2. Existing Conditions
3. Water Quality (future without condition)
4. Physical Facilities and Operations (future without condition)
5. Water Quality Problems and Opportunities
6. Land Use

The work plan briefly describes specific projects that will be eligible for Florida Forever funding in the FY2002 - 2006 period, as outlined in Appendix A of the MPMP (**Table 1**). Prior studies, reports and projects, July 2001 implementation schedule, financial schedule, and project descriptions are explained separately.

To put the importance of the CERP projects into perspective, **Table 1** summarizes estimated District real estate expenditures for FY2002 to FY2006 based on a real estate acquisition strategy, which was developed to support the CERP implementation schedule. The CERP implementation schedule reflects an annual revision as is called for in the MPMP as of July 2001. Only real estate costs are presented in **Table 1** because, in the 2002 - 2006 time frame, the District anticipates that Save Our Everglades (SOE) Trust Fund resources will be exclusively used to support real estate acquisitions. The estimated total real estate expenditures for this period is $703.11 million.

The $25 million annual contribution of Florida Forever funds to the SOE trust fund, while a significant contribution, will not be largest source of funds to support CERP. $75 million of general revenue funds will also go to the SOE Trust Fund. District ad valorem funds of $58.2 million are the next largest contribution. These funds will support both real estate and nonreal estate funding obligations. Other funding sources will mostly or exclusively support real estate acquisition. These include special state appropriations, CARL funds and credits for lands owned by or purchased utilizing local government funds.

Additionally, projects for which the SFWMD expects to seek reimbursement through Florida Forever in fiscal year 2002 are each explained in a manner that addresses the elements listed in s. 373.199(4),(5), F.S. These twelve projects are presented in the financial schedule (**Figure 1**). Due to the number of pages in the project plans, they will be included as part of **Appendix B** (on enclosed CD-ROM) of this work plan update. Many of the CERP real estate projects will not have completed descriptions by the submission date of the update; they will be submitted throughout the year as addendums, and placed electronically on the District's external web site.

Florida Forever Water Management District Work Plan

South F

Project Title	2002	2002 - 2006
Comprehensive Everglades Re		
Kissimmee River & Lake Okeechobee Region		
Taylor Creek/Nubbin Slough Storage and Treatment Area		
Caloosahatchee River/Southwest Florida Region		
C-43 Basin Storage Reservoir Project		
Upper East Coast		
C-44 Basin Storage Reservoir (Construction)*		
C-23, C-24 Storage Reservoirs (Construction)*		
Water Conservation Areas & Everglades Region		
WCA-3 Decompartmentalization, Part 1*		
Lower East Coast Region		
West Palm Beach Wastewater Reuse*		
Bird Drive Recharge Area Project*		
Palm Beach County Agricultural Reserve Reservoir Project*		
C-11 Impoundment Diversion and Canal		
Loxahatchee National Wildlife Refuge (Strazzula)*		
C-9 STA/Impoundment*		
Priority 1 - CERP Totals	$25,000,000	$125,000,00
W		
Kissimmee River & Lake Okeechobee Region		
Kissimmee River Restoration	$8,075,000	$32,300,00
Priority 2 - Restoration Totals	$8,075,000	$40,375,00
FLORIDA FOREVER TOTALS	$33,075,000	$165,375,00

* = indicates incomplete project description at time of work plan update

Figure 1. Five-Year Florida Forever Water Management District Work Plan Expenditures Schedule.

Table 1. Estimated Five-Year District Real Estate Expenditures for Eligible CERP Projects.

Project Title	Cost (FY2002 - FY2006)
P6- Wastewater Reuse Technology – Pilot Project	$1,558,500
1a- North of Lake Okeechobee Storage Reservoir (A)	$184,001,737
1b- Taylor Creek/Nubbin Slough Storage and Treatment Area (W)	$18,000,090
1c- Lake Okeechobee Watershed Water Quality Treatment Facilities (OPE)	$14,199,494
1d- Lake Okeechobee Tributary Sediment Dredging (OPE)	$844,921
4- C-43 Basin Storage Reservoir Project Part 1 (D – Part 1)	$51,259,648
7a- C-44 Basin Storage Reservoir (B)	$62,687,633
7b- C-23 and C-24 Storage Reservoirs (UU – Part 1)	$127,959,699
7c- C-25 and North Fork and South Fork Storage Reservoirs (UU – Part 2)	$13,525,483
12- Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project Part 1 (QQ – Part 1 and SS – Part 2)	$191,856
14- Loxahatchee National Wildlife Refuge Internal Canal Structures Project (KK)	$254,990
17a- Pal-Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE)	$4,639,042
17b- C-51 and Southern L-8 Reservoir (K - Part 1 and GGG)	$20,101,791
17c- Lake Worth Lagoon Restoration (OPE)	$288,000
17d- C-17 Backpumping and Treatment (X)	$5,174,688
17e- C-51 Back-pumping and Treatment (Y)	$13,421,100
18b- L-8 Basin ASR (K - Part 2)	$2,407,555
19b- Protect and Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract (OPE)	$2,205,301
19c- Hillsboro Site 1 Impoundment (M – Part 1)	$8,367,489
19d- Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management and North New River Conveyance Improvements (Q, O and SS Part 1)	$115,452,566
19e- C-9 Stormwater Treatment Area/Impoundment (R)	$4,700,119
19f- Dade-Broward Levee/Pennsuco Wetlands (BB)	$7,416,244
19h- Bird Drive Recharge Area (U)	$10,000,000
20- Palm Beach County Agricultural Reserve Reservoir Project (VV – Part 1)	$24,516,460
28- Biscayne Bay Coastal Wetlands Project (FFF and OPE)	$9,900,481
31- Florida Keys Tidal Restoration Project (OPE)	$32,023

The distribution of Florida Forever funds to CERP projects has not been specified in **Figure 1** because Florida Forever represents only about 18 percent ($125 million of $703 million) of planned real estate expenditures.

FLORIDA FOREVER PERFORMANCE MEASURES

The water management districts were mandated with jointly providing a report by December 15, 2000 to the Secretary of the FDEP, which established goals and performance measures that were to be used to analyze activities under s. 259.105(3)(a). In accordance with s. 373.1995, F.S., the Secretary forwarded the report for approval to the Board of Trustees of the Internal Improvement Trust Fund, the President of the Senate, and the Speaker of the House prior to the beginning of the 2001 regular legislative session. The legislature had the opportunity to reject, modify, or take no action regarding the goals and performance measures established by the report. If no action was taken, the goals and performance measures reflected in the report were to be implemented. On December 1, 2000, the districts jointly submitted their Florida Forever Goals and Performance Measures to Secretary Struhs. The goals and performance measures were developed in collaboration with the Florida Forever Advisory Council (FFAC).

The 1999 legislature created the FFAC. The council is composed of seven citizens appointed by the Governor and two ad hoc members of the legislature. Pursuant to s. 259.0345(7), the FFAC submitted a report which was similar to the requirements of the water management districts' report, but was limited in respect to the funding provided under s. 259.105(3)(b), which comprises the 35 percent of each bond issue provided to FDEP for its primary acquisition program.

In the report, the FFAC has grouped the 19 statutory goals into seven objectives and has created one new objective, i.e., Increase the Amount of Open Space Available in Urban Areas. For each objective, several performance measures have been created. The objectives and performance measures were reviewed and discussed by the Senate Natural Resources Committee. The members took no action to revise or reject the FFAC's recommendations.

Although the recommended objectives are very similar to the goals set out in s. 259.105(4), the recommended performance measures differ substantially from the statutory performance measures. Pursuant to s. 259.0345(7), if the legislature fails to take action regarding the FFAC's recommendations, they shall be implemented. In the event that takes place, there would be confusion as to which goals/objectives and performance measures would govern the majority of the program. Accordingly, the FFAC's recommendations are implemented in SB 1468 of the 2001 legislature, which also repeals the existing goals and performance measures. It should be noted that the FFAC's recommendations, if not altered by the legislature, become effective, but only to guide the FDEP's primary acquisition program. However, if enacted in the Florida Statutes - as was the case, the goals and performance measures apply to both the FDEP and water management districts. The new goals and performance measures are included in **Appendix A** (on enclosed CD-ROM).

PROJECT RANKINGS, SCHEDULE, AND RESOURCES

Funding and Manpower Resources

The cost to implement the current schedule falls within the revenues expected under the Comprehensive Plan funding legislation adopted by the legislature during the 2000 legislative session. This legislation proposes specific amounts from a variety of sources to fund the plan through 2002. The USACE funding for implementing the plan will be obtained through the federal budgeting and appropriations process on an annual basis and will be coordinated with what is being made available in Florida. It is anticipated that adequate manpower resources, both at the USACE and the SFWMD, will be available at planned funding levels.

Implementation Schedule

When the Comprehensive Plan was sent to Congress in 1999 it contained an implementation schedule that was, at the time, the best professional judgement of the Implementation Plan Team as to how the plan could be implemented. In 2000, the Implementation Plan Team began to revise the schedule to take into account new information regarding the projects themselves, the available funding and the nature of the SFWMD-USACE working relationship. As of this writing, the update of the Implementation Schedule is not complete. A final revised Implementation Schedule will be published as part of the revised MPMP, Volume II.

The July 27, 2001 version of the Implementation Schedule depicted in **Appendix D** (on enclosed CD-ROM) can best be thought of as a master sequencing of the projects as they currently stand. The Comprehensive Plan is conceptual in nature, consequently any schedule that is developed from that plan will also be conceptual. It is fully expected that the Comprehensive Plan adaptive assessment process will make changes to both the sequence and the nature of the projects themselves in the future. As those changes are defined, they will be incorporated into the Implementation Schedule. Changes that are likely to affect the schedule may include, but are not limited to, changes in funding levels, changes in performance targets for some projects and changes in planned locations for some projects. The schedule will be continually monitored to ensure that the proposed dates are both realistic and are being achieved.

Chapter 2
REGIONAL STUDY AREA

The study area encompasses approximately 18,000 square miles from Orlando to the Florida Reef Tract with at least 11 major physiographic provinces: Everglades, Big Cypress, Lake Okeechobee, Florida Bay, Biscayne Bay, Florida Reef Tract, nearshore coastal waters, Atlantic Coastal Ridge, Florida Keys, Immokalee Rise, and the Kissimmee River Valley. The Kissimmee River, Lake Okeechobee and the Everglades are the dominant watersheds that connect a mosaic of wetlands, uplands, coastal areas, and marine areas. The study area includes all or part of the following 16 counties: Monroe, Miami-Dade, Broward, Collier, Palm Beach, Hendry, Martin, St. Lucie, Glades, Lee, Charlotte, Highlands, Okeechobee, Osceola, Orange, and Polk.

The Central and Southern Florida Project (C&SF) Project, which was first authorized by Congress in 1948, is a multipurpose project that provides flood control; water supply for municipal, industrial, and agricultural uses; prevention of saltwater intrusion; water supply for Everglades National Park; and protection of fish and wildlife resources throughout the study area. The primary system includes about 1,000 miles each of levees and canals, 150 water control structures, and 16 major pump stations. The C&SF Project study area is shown on **Figure 2.**

The Upper St. Johns River Basin has been excluded from this study because it is a separate hydrologic basin which is not a part of the Everglades and South Florida ecosystems. The C&SF Project works in the Upper St. Johns River Basin (which are expected to meet the water resources needs of that basin) are nearing completion.

The following sections provide details on each of the regions that comprise this large study area. The Comprehensive Everglades Restoration Plan (CERP) Master Program Management Plan (MPMP) (USACE and SFWMD, 2000) identifies the following regions within the study area:

1. Kissimmee River and Lake Okeechobee Region
2. Caloosahatchee River/Southwest Florida Region
3. Upper East Coast Region
4. Everglades Agricultural Area (EAA)
5. Big Cypress Region
6. Water Conservation Areas (WCAs) and Everglades Region
7. Lower East Coast Region
8. Florida Bay and Keys Region

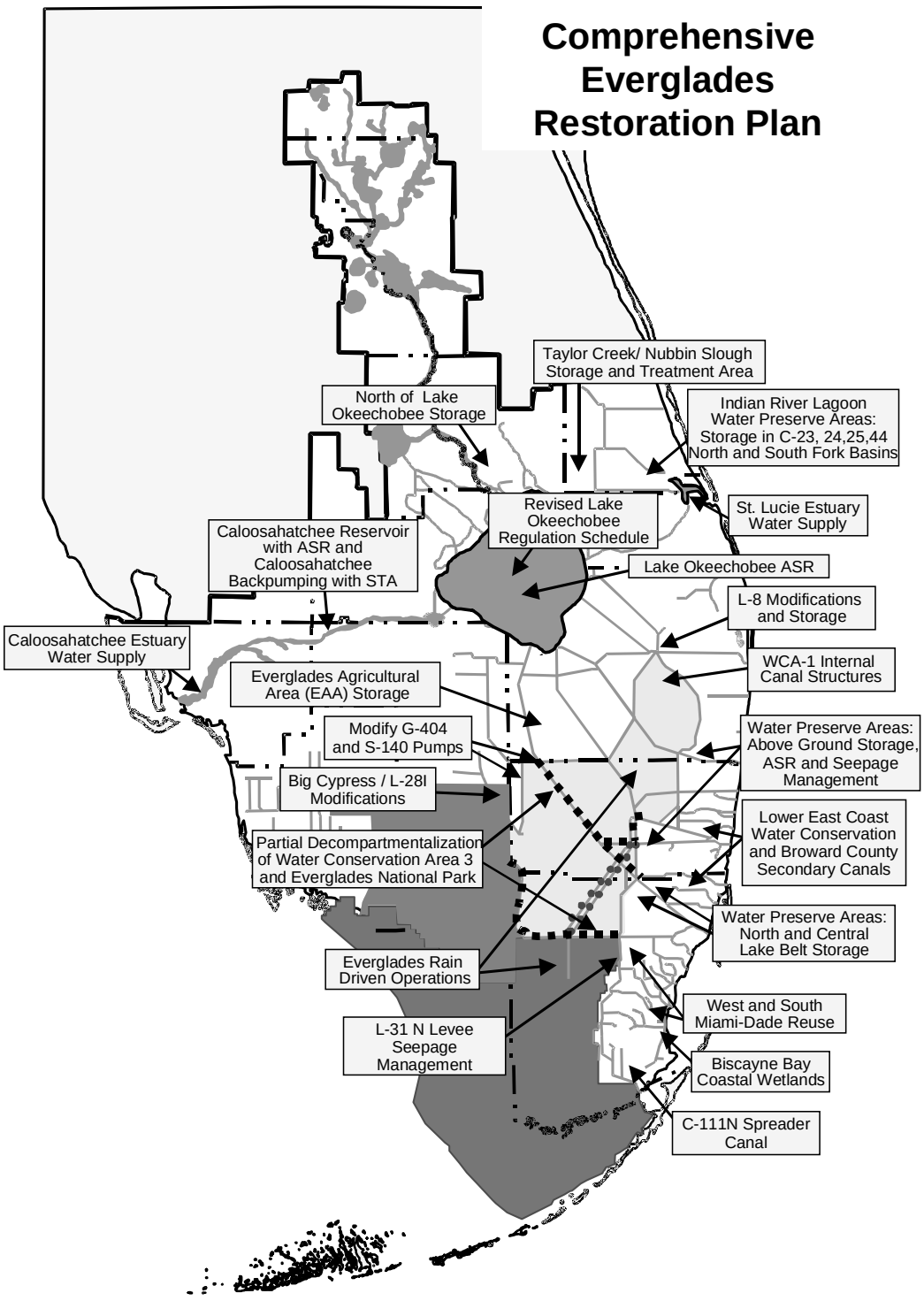

Figure 2. The Central and Southern Florida Flood Control Project Area.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - THE CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL PROJECT (PROJECT MODIFICATIONS)

The C&SF Project was authorized by the Flood Control Act of 1948 and modified by subsequent acts, as a plan of improvement for flood control, drainage, and other purposes covering a 18,000 square mile area of both Central and southern Florida. A number of efforts are currently underway by the United States Army Corps of Engineers (USACE) to modify the project for environmental improvement. The following is an inventory of C&SF Project modifications either in the planning, design, or construction phase. For the purpose of evaluating effects of alternative plans, they are included in the future without plan condition.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - REGIONAL OVERVIEW

Many of the regulatory and environmental restoration programs, which are assumed to be in place in 2050 are projected to result in a net improvement in water quality in South Florida. In addition to those assumptions, water quality improvement actions undertaken to comply with the requirements of the Federal Clean Water Act (P.L. 92-500) as implemented by the United States Environmental Protection Agency (USEPA), the Florida Department of Environmental Protection (FDEP), the South Florida Water Management District (SFWMD), the Seminole and Miccosukee Tribes, and local governments are expected to result in improvements in regional water quality necessary to comply with state, tribal, and local water quality standards. Examples of these programs include: Municipal Separate Storm Sewer Systems (MS4) and other National Pollutant Discharge Elimination System (NPDES) point and nonpoint source pollution reduction permitting requirements, Total Maximum Daily Loads (TMDLs) established under Section 303(d) of the Clean Water Act., and Pollutant Load Reduction Goals (PLRGs) established pursuant to the state of Florida's Surface Water Improvement and Management (SWIM) Act for designated priority water bodies.

From a regional perspective, the most comprehensive of these programs is the TMDL program implemented by FDEP and the Seminole and Miccosukee Tribes. Under Section 303(d) of the Clean Water Act, states and tribes are required to identify water bodies within their jurisdictions not meeting water quality standards and rank those water bodies in terms of the severity of the pollution and designated and actual uses of the water bodies. The 303(d)-listed water bodies are to be reported to the USEPA in accordance with Section 305(b) of the Clean Water Act. TMDLs are to be developed for 303(d)-listed water bodies consistent with the priority ranking and are to be established "at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality." However, the TMDL program, for the most part, has not been implemented in the study area.

In its 1998 report to the USEPA, FDEP identified approximately 160 impaired water bodies in the study area in accordance with the requirements of Section 303(d) of the Federal Clean Water Act. FDEP has developed a strategy for assessing watersheds (basins) and developing TMDLs and remediation plans for pollutants causing impairment of 303(d)-listed water bodies (FDEP, 1996a and FDEP, 1996b). It should be noted that excessive nutrient loads were typically identified as the most common pollutant causing impairment. FDEP's statewide strategy for implementing TMDLs involves five-year cycles for basin assessment, monitoring, data analysis and TMDL development, development of basin management plans, and implementation of basin management plans. However, it should be noted that this strategy has not yet been approved by the USEPA, and would take up to 15 years to complete (statewide) once approved. It should be further noted that the FDEP's strategy for TMDLs does not give regional priority to South Florida; rather, the strategy was developed from a statewide perspective. Nevertheless, several key water bodies in South Florida will receive priority for TMDL development, including Lake Okeechobee and the Indian River Lagoon (IRL).

Development and implementation of TMDLs is an essential step for achieving overall ecosystem restoration in South Florida. Water quality restoration targets are necessary for detailed design of Restudy recommended plan components to achieve water quality restoration performance objectives. Further, implementation of basin management plans developed under the TMDL program is necessary to achieve ecological restoration in watersheds "downstream" of recommended plan components.

The triennial review of state and tribal water quality standards performed under Section 303(c) of the Clean Water Act is another essential step for achieving ecosystem restoration in South Florida. States and tribes are required to periodically review their water quality standards to ensure that standards are adequate to protect designated uses of waters. Within the study area, there are no specific numeric water quality criteria for many pollutants (e.g., nutrients and several pesticides) detected in ongoing water quality monitoring activities. The extent of the contribution of such pollutants to overall "impairment" levels in 303(d)-listed water bodies is also unknown. As part of the triennial review process, FDEP and the Seminole and Miccosukee Tribes may propose modifications to existing water quality criteria and propose additional water quality criteria (as appropriate) to protect water resources. Modified and additional water quality criteria should be integrated with future detailed planning and design activities to assure that recommended plan components are operated consistent with water quality restoration targets.

The SFWMD is also developing pollution load reduction goals (PLRGs) for SWIM-listed water bodies. In South Florida, SWIM-listed water bodies include Lake Okeechobee, the IRL, and Biscayne Bay. PLRGs are similar to TMDLs in that numeric water quality targets are promulgated and remediation programs are developed. TMDLs and PLRGs are essential water quality restoration targets to be integrated into future detailed planning and design activities for recommended plan components during the implementation period.

Several larger municipalities within the study area are required to apply to the USEPA for "Municipal Separate Storm Sewer System" (MS4) permits to address nonpoint source pollution sources within their jurisdictional boundaries. MS4 permit requirements apply to master drainage systems of local governments with populations greater than 100,000. The USEPA has generally implemented the MS4 permitting program on a countywide basis, incorporating cities, Chapter 298 Drainage Districts, and the Florida Department of Transportation (FDOT) where appropriate. Cities with populations greater than 100,000 are permitted separately. The following municipal governments in the study area are currently subject to MS4 permitting: Reedy Creek Improvement District, Broward County (25 copermittees), city of Fort Lauderdale, city of Hollywood, Palm Beach County (39 copermittees), city of Hialeah, Miami-Dade County (20 copermittees), city of Miami, and Lee County (12 copermittees). Local government regulatory programs to control smaller point and nonpoint sources of pollution will compliment state and tribal water quality regulatory and remediation programs.

The following sections summarize projected water quality problems and opportunities in study area subregions. Accurately projecting future water quality conditions in the Restudy area is difficult, due to the vast scope of the study area, uncertainty in future growth and land use changes, and in part to the lack of comprehensive water quality data indicative of statistically reliable trends (FDEP, 1996a). The following subsections predict water quality changes expected to occur within each of the C&SF Project subregions based on current water quality data and descriptions of existing conditions, available trend data, future population growth projections and the assumed implementation of certain specific regulatory and environmental restoration and water supply projects. Actual improvements in water quality conditions, where projected to occur, depend in large degree upon the successful implementation of the programs and projects included in the future without plan assumptions. For mercury, conditions are projected for the regional system as a whole.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - MERCURY

There is much uncertainty about the sources of mercury in South Florida and the Everglades marsh mercury cycling processes that control mercury bioaccumulation. Controlling mercury contamination of the Everglades ecosystem depends on actions that are beyond the scope of the Restudy. The major external source of mercury for the Everglades ecosystem is atmospheric deposition. Some estimate that a high percentage of the mercury deposited into the Everglades could be contributed from local atmospheric emission sources in the urban area (Dvonch, 1998). Others estimate that most of the mercury deposited on the Everglades originates from outside Florida. Research indicates that mercury deposition rates in portions of North America have greatly increased since the turn of the century (Swain, et. al., 1992). Some of this historically accumulated mercury is being recycled by the ecosystem; however, this historical mercury could also be buried beneath the recycling zone by accumulating peat if new sources are shut off.

The effect of this burial process hypothesis has been estimated with a mercury cycling model (Ambrose et al., in press). The model predicts that as little as a 50 percent reduction in atmospheric mercury deposition over the next 50 years (2050) will decrease methylmercury concentrations in Everglades water and fish. Recent and potential future regulatory emission controls may be needed to reduce the atmospheric loading to the system from local sources; however, the significant global atmospheric mercury component is much more difficult to control and will require international agreements.

If control of atmospheric mercury deposition can be affected by decreasing local emission sources in concert with the implementation of the 44,000 acres of stormwater treatment areas (STAs) constructed as part of the Everglades Construction Project (ECP), additional benefits may accrue. However, the complex interactive modeling predictions have not yet been done. The long-term efficiency of the STAs in removing phosphorus and other water quality constituents is presently uncertain, as is the effect of these water quality changes on mercury cycling downstream. Among the key factors that are thought to influence mercury cycling within the Everglades are complex interrelationships involving phosphorus, sulfur, oxygen, carbon, periphyton, peat accretion, and sediment redox conditions. There is no scientific consensus as to which of these factors will dominate, and whether the driving factors will be the same throughout all portions of the 4,000 square mile Everglades ecosystem. Given the 80 percent reduction in total phosphorus obtained in the Everglades Nutrient Removal Project during the early years of operation, it is possible that a decrease in the methylation of mercury could occur downstream due to the declining nutrient concentrations to the marsh and the reduced stimulation of both producers and decomposers. However, it is unclear what effect changes in sulfur forms will have on mercury methylation, and which influence will dominate.

LAND USE

The existing use of land within the study boundaries varies widely from agriculture to high-density multifamily and industrial urban uses. A large portion of South Florida remains natural, although much of it is disturbed land. The dominant natural features are the federally protected Everglades National Park and Big Cypress National Preserve (BCNP) at the southernmost tip of the peninsula, Lake Okeechobee, and the state protected WCAs in the westernmost reaches of the Lower East Coast counties. Generally, urban development is concentrated along the Lower East Coast from Palm Beach County to Miami-Dade County, in the Central Florida/Orlando area, and on the Lower West Coast from Fort Myers to Naples.

Most of the interior of the study area is in agricultural use, which includes sugarcane (the dominant crop) and vegetable farms in the EAA of western Palm Beach County and Hendry County; the Agricultural Reserve Area of Palm Beach County; and the south Miami-Dade agricultural area where vegetable crops dominate, especially tropical varieties. There are citrus groves in every county, but citrus is concentrated in St. Lucie and Martin counties on the east coast and Hendry, Highlands, Collier, and Glades

counties on the west. Cattle and dairy farms predominate in Glades, Highlands, and Okeechobee counties.

In the northern portion of the system, around Orlando, tourism and its attendant service-oriented land uses (for example, hotels, motels, convenience stores, and souvenir shops) make up a significant portion of the landscape. Agriculture, however, continues to play an important role in the region, with over two million acres being farmed, half of which is pasture land. The area surrounding Lake Okeechobee is largely rural, with agriculture the prevailing land use. There are over 580,000 acres of irrigated farmland in the EAA (B. Boyd, pers. comm.). Farm products produced there include sugarcane, the predominant crop, rice, row crops, and sod. There is also extensive pasture land both west and north of the lake. Directly south of the EAA lie the WCAs. The conservation areas cover 1,372 square miles and consist mainly of sawgrass marshes and tree islands. The 1948 C&SF Project created the WCAs for the conservation of water supplies for the Lower East Coast.

The Upper East Coast is comprised of St. Lucie and Martin counties; the landscape is dominated by agricultural uses. Significant natural resources, the St. Lucie Estuary and IRL, are also contained within this area. Urban land use, which makes up 17 percent of the Upper East Coast, is mainly concentrated along the seaboard coastal and lagoon shorelines. The Lower East Coast extends approximately 100 miles through the coastal portions of Palm Beach, Broward, and Miami-Dade counties. Being the most densely populated area in the state, the Lower East Coast is home to one third of the state's population, more than 4.5 million people. The area is primarily an urban megalopolis, but it also contains substantial agricultural acreage, particularly in southwestern Miami-Dade County (90,000 acres) and western Palm Beach County (29,000 acres). Rapid population growth and land development practices have resulted in notable western urban sprawl; the predominant land use is single-family residential. The once significant rural population in the western areas of the counties, especially in Miami-Dade and Broward, has practically disappeared, resulting in an urbanized makeup in population. Palm Beach County is not far behind.

The Florida Keys are made up of over 1,700 islands that encompass approximately 100 square miles and contains the largest reef system in the United States. While a majority of the county is designated as conservation land, due to the land falling within either Everglades National Park, BCNP, or the National Key Deer Refuge, land use is primarily either residential or geared towards supporting the region's main industry (tourism). The county's fragile natural resources and vulnerability caused the state of Florida to designate the area as an Area of Critical State Concern in 1975; such designation is intended to protect such resources from degradation by strictly regulating development.

The southwestern counties of Collier and Lee are the fastest growing in terms of population in the state. Population growth is mainly due to the inmigration of retirees, not a high birthrate. The coast has become highly urbanized, with development spreading eastward into agricultural and natural lands. Agriculture is however, a major industry, especially in Lee County where citrus predominates.

STUDY PURPOSE

The purpose of the Restudy was to reexamine the C&SF Project to determine the feasibility of structural or operational modifications to the project essential to the restoration of the Everglades and the South Florida ecosystem, while providing for other water-related needs such as urban and agricultural water supply and flood protection in those areas served by the project. The intent of the study is to evaluate conditions within the study area and make recommendations to modify the project to restore important functions and values of the Everglades and South Florida ecosystem and plan for the water resources needs of the people of South Florida for the next 50 years.

Planning by the USACE for water resources projects is accomplished in two phases: a reconnaissance phase and a feasibility phase. The reconnaissance phase is conducted at full federal expense, while the cost of the feasibility phase is shared between the federal government and the nonfederal sponsor. The nonfederal sponsor for this study is the SFWMD.

The reconnaissance phase defines problems and opportunities, identifies potential solutions, and determines if planning should proceed further into the feasibility phase based on federal interest and identification of a nonfederal sponsor willing to support further study. The reconnaissance phase of this study was initiated in June 1993 and the reconnaissance report was completed in November 1994. The objective of the reconnaissance study was to identify problems and opportunities, formulate alternative plans, evaluate conceptual alternative plans, and recommend, if feasible, further detailed studies. The reconnaissance study helped to frame issues and set the direction for further detailed studies carried out in partnership with the local sponsor during the feasibility study.

Feasibility studies further develop the most promising alternatives and recommend a plan for authorization by Congress. The feasibility phase for this study was initiated in August 1995 following approval of the Project Study Plan by the USACE headquarters and the Governing Board of the SFWMD. As a result of the passage of the Water Resources Development Act of 1996, a revised Project Study Plan was approved in May 1997.

The recommended plan is designed in greater detail during the preconstruction engineering and design phase, necessary real estate is then acquired, and then the project is constructed.

STUDY SCOPE

The purpose of the Restudy was to develop a Comprehensive Plan for the overall regional C&SF system and the tools necessary to evaluate the Comprehensive Plan as well as separable and incremental portions of the project. This study represents the first thorough, systemwide update since the project's original inception. The Comprehensive Plan will include such features as are necessary to provide for the regional water-related

needs of the region; including flood control, the enhancement of water supplies, and other objectives served by the C&SF Project. This feasibility study included hydrologic modeling, environmental modeling, water quality analyses, and water supply studies that refined the information developed in the reconnaissance study. The feasibility study was conducted to identify a Comprehensive Plan for the C&SF Project and an adaptive implementation and operational strategy based on monitoring, evaluation, and modeling.

The Comprehensive Plan presented in this report is similar in scope to that contained in the 1948 Comprehensive Report for the C&SF Project (House Document 80-643). This feasibility report does not include the normal level of detail that is expected from much smaller projects, such as the identification of specific sites for proposed project facilities. The Comprehensive Plan identifies components needed to restore the South Florida ecosystem, which includes the needs of all users, and the formulation process that produced them, from the viewpoint of hydrologic impacts of the regional water management system. This report also documents the uncertainties in plan selection and future tasks that will be needed to minimize these uncertainties. Engineering and real estate cost estimates are based on the analyses and assumptions made during the process of formulating and developing the components of the Comprehensive Plan. Uncertainties in design details and uncertainties in the exact location of components could impact future alternative analyses and subsequent design and cost estimates.

OTHER STUDIES

There are a number of ongoing studies being conducted by the USACE and other agencies that may contribute to restoration of the South Florida ecosystem. Some of the major efforts are discussed in this section.

The USACE is currently conducting a feasibility study of Biscayne Bay in order to investigate effects on water circulation, biological communities, and water quality of dredging and filling, spoil islands, and freshwater inputs in northern Biscayne Bay from existing federal canals. The study would propose solutions to alleviate adverse factors affecting the bay and help to develop guidelines for future management of Biscayne Bay's natural resources. The nonfederal sponsor is Miami-Dade County.

The South Florida Ecosystem Restoration Task Force observed that the restoration effort needed to be founded on scientific information and mandated that it take an ecosystem approach. In support of this effort, the Science Subgroup completed a report in 1996 entitled South Florida Ecosystem Restoration Scientific Information Needs (Science Subgroup, 1996), which provides information in support of the ecosystem approach. It was the first step in the development of an ecosystem-based South Florida Comprehensive Science Plan that includes monitoring and modeling. The Science Coordination Team (formerly the Science Subgroup) is in the process of developing a science plan to supply the information needs for ecosystem restoration.

The science plan developed by the Florida Bay Interagency Working Group, initiated by Everglades National Park in January 1993, focused upon the research,

monitoring, and modeling objectives that must be addressed to guide the restoration of Florida Bay. It represents a synthesis of research plans prepared over past years by several federal and state agencies.

The SFWMD has undertaken the development of regional and subregional level water supply plans to provide for better management of South Florida's water resources. The Lower West Coast Water Supply Plan was completed in April 2000 (SFWMD, 2000). The Lower East Coast Regional Water Supply Plan, which addresses water-related needs and concerns of southeastern Florida through the year 2020 was completed in April 2000 (SFWMD, 2000). The Upper East Coast Water Supply Plan (SFWMD, 1998b), which evaluates future 2020 water demands and supplies for the Upper East Coast of Florida was completed in 1998.

PERMITS AND AUTHORIZATIONS

The timely processing and approval of permits and other regulatory authorizations is critical to completing design and construction on schedule and being able to operate a project once construction has been completed. To ensure that all required authorizations are processed and approved in a coordinated and timely manner, the USACE and SFWMD project managers will include staff, as necessary, from their respective regulatory/ permitting divisions and a representative from the FDEP on the Project Delivery Team. During development of the Project Management Plan for each project, the Project Delivery Team will identify a list of all permits and authorizations that are required for design, construction and operation of the project. This list, along with a schedule, milestones and agency responsibilities for obtaining the required permits, will be included in the Project Management Plan.

The USACE and the SFWMD project managers will maintain close communication and coordination to identify and address any required permit or water quality certification applications and negotiations as well as any conditions included in these authorizations. Where appropriate, final conditions on a permit or authorization will be approved by both the USACE and the SFWMD project managers prior to issuance of a draft permit or certification.

During the implementation of the Comprehensive Plan, certain general principles shall be observed:

- The USACE and the SFWMD will be jointly responsible for ensuring that projects will deliver design benefits, including flood control, water supply, water quality, environmental restoration, and other authorized project purposes.
- Operating criteria to ensure delivery of project benefits will be developed, to the greatest extent possible, during the Project Implementation Report phase of each project.
- If, for any reason, a project appears to fail to deliver the designed benefits, as identified through the RECOVER process, the

USACE and SFWMD will both work to address the problem and take such action as necessary to ensure that the project benefits are attained.

- In as much as this is a federal project, the USACE will not be issuing 404 permits for this effort. As is usually done for federal projects, a 404(b)(1) evaluation will be performed.
- Transfer to Operations and Maintenance (O&M) Authority will occur upon completion of the interim operational testing and monitoring period.

Chapter 3
KISSIMMEE RIVER AND LAKE OKEECHOBEE REGION

PHYSICAL CONDITIONS - KISSIMMEE RIVER REGION

The Kissimmee River Basin is comprised of 3,013 square miles and extends from Orlando southward to Lake Okeechobee. The watershed, which is the largest source of surface water to the lake, is about 105 miles long and has a maximum width of 35 miles.

Project works in the basin for flood control and navigation were constructed by the United States Army Corps of Engineers (USACE) as part of the Central and Southern Florida Flood Control Project (C&SF Project). Upper Basin works consist of channels and structures that control water flows through 18 natural lakes into Lake Kissimmee. The Lower Basin includes the channelized Kissimmee River (C-38) as a 56-mile earthen canal extending from Lake Kissimmee to Lake Okeechobee.

The northern portion of the basin is comprised of many lakes, some of which have been interconnected by canals. This large subbasin, often termed the Upper Basin is bounded on the southern end by State Road (SR) 60, where the largest of the lakes, Lake Kissimmee, drains into C-38.

The Upper Basin is 1,633 square miles and includes Lake Kissimmee and the east and west Chain of Lakes area in Orange and Osceola counties. A 758 square mile Lower Basin includes the tributary watersheds of the Kissimmee River between the outlet in Lake Kissimmee and Lake Okeechobee. The 622 square mile Lake Istokpoga area provides tributary inflow to the Lower Basin.

EXISTING CONDITIONS - KISSIMMEE RIVER REGION WATER MANAGEMENT

The system of water control works now in place in the Kissimmee Basin conforms closely with the general plan outlined in the 1948 report to Congress and authorized for construction in 1954. The project was designed to provide flood damage prevention for 30 percent of the standard project flood (SPF). This equates to protection against a five-year flood event. Water levels within the basin are controlled by a complex system of canals and control structures that are managed by the South Florida Water Management District (SFWMD) in accordance with regulations prescribed by the Secretary of the Army.

The major lakes of the Upper Basin are connected by channels. Most of the channels were excavated by private interests in the 1880’s and subsequently enlarged to varying degrees under the congressionally authorized plan. Nine control structures regulate water levels and flows in the lake system. For more details on the existing flood

control project, refer to the USACE Kissimmee River, Florida – Final Feasibility Report and Environmental Impact Statement (1985). Operational criteria for both basins can be found in the Water Control Plan for the Kissimmee River-Lake Istokpoga Basin (1991). From time to time, operations may temporarily deviate from the water control plan. These temporary deviations may be conducted for various purposes such as control of nuisance aquatic vegetation, lake drawdowns, or construction.

Prior to the project, lake outlets within the Upper Basin had been dredged for drainage and navigation, but were uncontrolled, and over-drainage often occurred. Dredged outlets did not provide adequate flood control and the Upper Basin did not have enough outlet capacity (sometimes termed “get away” capacity) to remove flood waters within a reasonable time frame to avoid flood impacts.

To provide adequate outlet capacity from the Upper Basin, approximately 15 miles of canal, the outlet channel, was required immediately downstream of Lake Kissimmee. This length is a function of canal size, the size of the Lake Kissimmee outlet structure size (S-65), and the very flat terrain immediately downstream of the lake.

An earlier project, the Herbert Hoover Dike around Lake Okeechobee, had modified the original lower end of the Kissimmee River with a borrow area immediately upstream of Lake Okeechobee. This 8 mile section of canal, known as Government Cut, was modified and enlarged during construction of C-38, and is inside the Lake Okeechobee containment levee. This section of the canal diverted flow from a downstream portion of the Kissimmee River, creating an isolated remnant of the river known as Paradise Run. Paradise Run, immediately west of Government Cut, retains most of its original topography; however, diversion of natural flows has lowered water levels and former wetland areas have been converted to grazing and pasture land.

Between the outlet channel at the upper end of the Kissimmee River (C-38), and Government Cut at the lower end, approximately 33 miles of the river and floodplain, referred to as the central reach, also was provided flood control. Some consideration was given to nonstructural approaches (e.g., levee the uplands from the floodplain); however, channelization was determined to be more cost effective at that time. Combined with Government Cut, the new canal provided complete channelization of the entire 56-mile river-floodplain from Lake Kissimmee to Lake Okeechobee.

The natural fall of the land from Lake Kissimmee to Lake Okeechobee is about 36 feet. Construction of Canal 38 (known as C-38) included six water control structures, S-65, 65A, 65B, 65C, 65D, and 65E from north to south, which form a series of five pools between S-65 and Lake Okeechobee.

The S-65 structures act as dams, and were located to step the canal water level down in increments of about 6 feet. In doing so, the natural slope of the river was removed, and flat pools (impoundments) resembling stair-steps were created. The water level of each pool generally is held constant, with little fluctuation or slope. This action has lowered water in the northern reach of each pool, and has created flooded marsh in the

southern or lower end of each pool. A water surface area of approximately 7,600 acres is included within these pool areas under the existing regulation schedules.

The C-38 is generally 30 feet in depth, but varies in bottom width from 90 feet near Lake Kissimmee to 300 feet above S-65D. The canal's length, width, and water level vary in each pool. The head, or difference in water level above and below each structure, varies from structure to structure and with rate of discharge, but is typically about 6 feet.

During construction of C-38, a temporary easement was used to obtain areas adjacent to the canal for deposition of dredged material. The material was hydraulically deposited in linear alignments covering some 8,000 acres along the canal, with elevations averaging 15 feet above preproject topography. The material consisted of hydraulically sifted subsoil sands and clays with limited organic fraction, and high percolation rates. The material became part of the property upon which it was deposited. A number of landowners subsequently used the material to fill low areas on their property; and, at two locations in Okeechobee County, flood free, fly-in, residential subdivisions were built on the material. Where material was left undisturbed, xeric vegetation emerged on many of these deposits.

The CS&F Project works improved navigation opportunities originally provided in the Congressional Act of 1902. Each water control structure along C-38 includes a 30-foot by 90-foot navigation lock, which can accommodate boats with drafts up to 5.5 feet. The canal provides continuous navigation; however, interpool navigation is limited to daylight hours of lock operations.

The approximately 68 miles of river oxbows that exist within the five C-38 pools represent secondary channels of widely varying water depths. Many of these channels are very shallow, but only those that receive tributary inflows have any substantial baseflow. Culverts within the tieback levees at structures S-65B, 65C, and 65D provide modest amounts of circulation flow in the existing river channels below the levees.

Approximately 50 tributaries provide inflow into the Lower Kissimmee Basin. These tributaries are characterized by relatively constricted central channels with pasture lands usually extending along the channel. Most channels are covered with vegetation.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - KISSIMMEE RIVER REGION

Several planned and ongoing environmental restoration projects are expected to be completed which would beneficially affect water quality in the Kissimmee River Watershed. Of particular importance is the Kissimmee River Restoration Project (including the Headwaters Revitalization and Modified Level II Backfilling projects). The Kissimmee River Restoration Project is expected to result in the restoration of approximately 26,500 acres of former wetlands in the vicinity of the Kissimmee Chain of Lakes (USACE, 1996) and at least 24,000 acres of former (drained) wetlands south of Lake Kissimmee (USACE, 1991).

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - KISSIMMEE RIVER RESTORATION

In the future without plan condition, the Kissimmee River Restoration Project will be in place and functioning. The restoration project, authorized by the Water Resources Development Act of 1992, will create a more natural physical environment in the lower Kissimmee River Basin. The major components of the project include the following:

- Reestablishment of inflows from Lake Kissimmee that will be similar to historical discharge characteristics (headwaters component)
- Acquisition of approximately 85,000 acres of land in the lower Kissimmee Chain of Lakes and river valley
- Continuous backfilling of 22 miles of canal
- Removal of two water control structures
- Recarving of 9 miles of former river channel

The Kissimmee River Basin contributes about 30 percent of the water input to Lake Okeechobee. The supply of water to Lake Okeechobee is anticipated to be reduced by about 1.60 percent as a result of the implementation of this project.

As a component to the Kissimmee River Restoration Project, the modification of the Upper Chain of Lakes regulation schedules and associated canal and water control structure modifications, will restore the ability to simulate the historic seasonal flow from Lake Kissimmee to the Lower Basin, and provide higher fluctuations of water levels in the lakes. The project will result in the expansion of the lakes' littoral zones by up to 18,500 acres, and improved habitat to fish and wildlife on lakes Kissimmee, Hatchineha, Cypress, Tiger, and Jackson. The project will also increase spatial and temporal dynamics produced through long-term fluctuations of seasonal water levels.

The Kissimmee River Restoration Project will meet two hydrologic conditions (criteria) that must be reestablished to restore the Lower Basin ecosystem. These conditions are; the reestablishment of continuous flow with duration and variability characteristics comparable to prechannelization records; and reestablishment of stage hydrographs that result in floodplain inundation frequencies comparable to prechannelization hydroperiods, including seasonal and long-term variability characteristics.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - KISSIMMEE RIVER REGION

By 2050, water quality conditions in the Kissimmee River Watershed south of urbanized Orange County are expected to be improved overall compared to existing conditions due to ongoing and planned ecological restoration programs in the drainage

basin. In its 1998 303(d) list, the FDEP identified approximately 25 water bodies or segments of water bodies within the Kissimmee River Watershed where water quality was not adequate to sustain designated uses. Several of the 303(d) listed water bodies are actually reaches of the Kissimmee River. Most of the watershed is classified as Class III ("fishable–swimmable") waters; several water bodies within the watershed are designated Outstanding Florida Waters by the state of Florida. Pollutants and/or water quality criteria identified contributing to impairment of designated use include: low levels of dissolved oxygen (DO), excessive nutrients, coliform bactieria, high biochemical oxygen demand (BOD), several trace metals including mercury (based on fish-consumption advisories), turbidity, and un-ionized ammonia.

Kissimmee River Restoration projects are expected to reduce net pollution loading to the Kissimmee River and in downstream Lake Okeechobee through the restoration of remnant wetlands presently used as agricultural lands currently contributing pollutants to wetlands. Restored wetlands will also have a pollutant assimilation function, resulting in improved water quality in downstream water bodies (tributaries and oxbows). Additional ongoing land acquisition activities by the SFWMD will supplement ongoing environmental restoration projects (SFWMD, 1997a).

The extent of urbanization in the vicinity of the cities of Orlando and Kissimmee, north of the Kissimmee River Chain of Lakes is expected to increase. While new developments must comply with water quality treatment requirements for stormwater runoff, the net load of pollutants, particularly those typically associated with urban stormwater runoff contributed to the watershed north of the Kissimmee Chain of Lakes is expected to increase. Most of this increased pollution load would be expected to be retained in the Kissimmee Chain of Lakes and not enter the Kissimmee River – Lake Okeechobee system. Urbanization and attendant pollution loads in the region are not expected to increase significantly south of Lake Kissimmee.

LAND USE - KISSIMMEE RIVER REGION

Orlando, at the headwaters of the Kissimmee River Basin, is the primary economic and transportation center in the study area. Once the center of the state's orange production, the local economy of Orlando and the surrounding area now focuses on tourism. Kissimmee, located in Osceola County, is located 8 miles east of Disney World and 17 miles south of Orlando, and is influenced largely by tourism activities in the Orlando area. The other major incorporated area of Osceola County, the city of St. Cloud, is primarily a retirement community.

Land uses in the Upper Basin around the perimeters of Lakes Kissimmee, Hatchineha, Cypress, Rosalie, Tiger, and Jackson are primarily pasture, some agriculture, and a large amount of wetlands. Marinas, fish camps, and various public facilities, such as boat launching sites and picnic areas, are located around the lakes. Development is more intense upstream of Cypress Lake, particularly in the Lake Tohopekaliga – East Lake Tohopekaliga (Toho) chain. Lake Kissimmee State Park is on the extreme northwestern periphery of Lake Kissimmee, and the Three Lakes Wildlife Management Area and

Prairie Lakes Preserve border the southeastern half of Lake Kissimmee. The 45,000 acre Kissimmee Prairie State Reserve is directly east of Avon Park in Pool B. Small residential and commercial areas are also scattered around most of the lakes.

Agriculture continues to play an important role in the region. In the Lower Basin, most of the area between Lake Kissimmee and Lake Okeechobee is in fewer than fifty large, private land holdings and several hundred subdivided property holdings. Agriculture remains the primary land use activity within the Lower Basin, being dominated by extensive beef cattle production and dairy activities.

The Avon Park Air Force Bombing Range is located within the Highlands County portion of the Lower Basin. This 107,000-acre federal facility is used both as a training facility for Armed Forces personnel, and as a management area for wetlands adjacent to the Kissimmee River.

Lower Basin lands have undergone substantial change over the last twenty years. Most notable is the conversion of unimproved pasture land to improved pasture at an accelerated pace during the period 1958 to 1972.

In the Upper Basin, most of the development susceptible to flood damage is urban, where damage is primarily a function of the depths of flooding inside structures or the stage of flooding. Single family residential land use is the primary type of development affected by flooding in the Upper Basin. Major affected areas are located around the towns of Kissimmee and St. Cloud, which cover only six percent of the damage susceptible flood-prone area but account for almost half of the basin's standard project flood damage. Other affected areas include Lake Hart, Lake Mary Jane, Pells Cove, Hidden Lake, Lake Hatchineha, Lake Alligator, Lake Rosalie, and the area west of the southern part of Lake Kissimmee. Existing average annual equivalent flood damages in the Upper Basin are estimated to be $1,226,100 (8 ¾ percent rate).

In the Lower Basin, mobile homes located around Pool E are the primary areas that would be affected by flooding. Although this land use would account for most of the damages from a standard project flood and 100-year event, it is not susceptible to damage during smaller floods. Other damages occur due to the duration of flooding on pasture land. Although agricultural use is the primary land use in the Lower Basin, flood damages are relatively minor for this activity due to the short duration of flooding, a result of the existing project works. Existing average annual equivalent damages in the Lower Basin are estimated to be $97,700 (8 ¾ percent rate).

Agriculture

Osceola, Polk, Highlands, and Okeechobee counties were included in this region. More than two million acres in these counties are farmed, with more than half of this area devoted to pasture land (UFBEBR, 1995). Much of this acreage is likely categorized as unique farmland based upon its location, growing season, and high value crops, including citrus. Almost a quarter of a million acres in the Kissimmee River Basin are irrigated

(UFBEBR, 1995), requiring a dependable water supply. This region is characterized by large farms with relatively low productivity per acre. These four counties are among the top five counties in Florida for cattle production, both beef and dairy (FASS, 1996a). More than 200,000 acres are used for citrus production. Approximately 11,000 people are employed in agricultural production and services representing a payroll of approximately $21 million (UFBEBR, 1995). The market value of all agricultural products in this region totals approximately $575 million (UFBEBR, 1995).

PHYSICAL CONDITIONS - LAKE OKEECHOBEE REGION

Lake Okeechobee lies 30 miles west from the Atlantic coast and 60 miles east from the Gulf of Mexico in the central part of the peninsula. Lake Okeechobee is abroad shallow lake occurring as a bedrock depression. The large, roughly circular lake, with a surface area of approximately 730 square miles, is the principal natural reservoir in southern Florida.

The lake's largest outlets include the St. Lucie Canal eastward to the Atlantic Ocean and the Caloosahatchee Canal and River to the Gulf of Mexico. The four major agricultural canals – the West Palm Beach, Hillsboro, North New River, and Miami canals - have a smaller capacity, but are used whenever possible to release excess water to the Water Conservation Areas (WCAs), south of the lake, when storage and discharge capacity are available. When regulatory releases from the lake are required, excess water can be passed to the three WCAs up to the capacity of the pumping stations and agricultural canals, with the remainder going to the Atlantic Ocean and Gulf of Mexico.

The waters of the lake are impounded by a system of encircling levees, which form a multi-purpose reservoir for navigation, water supply, flood control, and recreation. Pumping stations and control structures in the levee along Lake Okeechobee are designed to move water either into or out of the lake as needed.

Other surface water bodies include the Kissimmee River, Fisheating Creek, and Taylor Creek that flow into the lake from the north; the Caloosahatchee River that flows out of the lake to the west; the St. Lucie and West Palm Beach canals that flow out of the lake to the east; and the Hillsboro, North New River, and Miami canals that flow out of the lake to the south. The hydroperiod of the lake is partially controlled, permitting water levels to fluctuate with flood and drought conditions and the demand for water supply.

EXISTING CONDITIONS - LAKE OKEECHOBEE WATER MANAGEMENT

Historically, water levels in Lake Okeechobee were probably much higher than they are today (Brooks, 1974), perhaps as high as 6.1 meters (20 feet) NGVD (National Geodetic Vertical Datum). Prior to large scale development, and construction of the Herbert Hoover Dike, the lake had no channeled outflows, and water overflowed the lake as sheet flow to the south and east. This resulted in a much larger and broader littoral zone and marsh ecosystem to the north and west than the existing one. Today, as the primary

reservoir of the Central and Southern Florida Flood Control Project, Lake Okeechobee is capable of storing 2.7 million acre-feet of water between stages of 3.2 meters (10.5 feet) above msl and the top of the regulation schedule at 5.3 meters (17.5 feet) above msl.

Water levels in the lake are managed according to a regulation schedule that was developed by the SFWMD and the USACE. The schedule is designed to maintain a low level of 4.7 meters (15.5 feet) during the wet season in order to provide storage capacity for excessive amounts of rainfall and to prevent flooding in surrounding areas. The stage at the end of the wet season is regulated at a maximum of 5.3 meters (17.5 feet) in order to store water for the dry season. The Caloosahatchee and St. Lucie canals are the primary outlets for release of flood waters when the lake is above regulation stages.

A series of structures are situated around the lake, which provide flood protection, control drainage, and facilitate navigation. The USACE operates the primary structures and navigation locks around the lake and is responsible for maintenance of the schedule. The SFWMD operates and maintains the secondary water control structures and pump stations.

Historically Lake Okeechobee's regulation schedule was developed primarily to meet flood control and water supply objectives, the primary purposes for construction of the C&SF Project. The environmental concerns for the lake's littoral zone and wildlife habitat and the downstream estuaries have generally been compromised in order to meet the water supply needs of South Florida.

Trimble and Marban (1988) performed an analysis of the Lake Okeechobee regulation schedule which incorporated a trade off analysis framework and resulted in the recommendation of an improved schedule known as "Run 25", which is the regulation schedule now in use This recommended schedule reduced the water quality impacts associated with regulatory discharges to the St. Lucie and Caloosahatchee estuaries by reducing the need to discharge large volumes of freshwater from the lake, without significantly impacting existing flood control, water supply and environmental benefits provided by the previous Run (15.5-17.5 feet) schedule approved in 1978. This schedule was approved by the District's Governing Board in December 1991 and approved on a two year interim basis by the USACE in May of 1992. Regulatory releases are to occur at lower lake stage and at lower and more environmentally sensitive rates of discharge than the previous schedule. The lower rates of discharge are made in a "pulse" fashion, which simulates a natural rainstorm event within the St. Lucie (C-44) Basin. Each pulse takes 10 days to complete. This method is designed to allow estuarine biota to tolerate changes in salinity and the discharges to remain within the natural range of freshwater flow to the estuary.

Water Quality

Lake Okeechobee may be considered a naturally eutrophic water body that is tending to become hypereutrophic, due primarily from nutrient inputs from the Kissimmee River and the Taylor Creek basins. Water quality conditions in the upper Kissimmee River

appear to be improving, primarily due to rerouting of wastewater flows from the river to reuse and ground-water discharge sites. However, large quantities of nutrients are still discharged from Lake Toho to Lake Kissimmee and other downstream areas. Water quality improves from Lake Kissimmee to near Lake Okeechobee, where the channel flows mostly through unimproved rangeland; however, pollutant loadings increase as cattle and dairies grow more numerous near the lake. Because the lake's phosphorus is internally recycled and a vast reservoir of the nutrient is stored in ground water as well as wetland and canal sediments, phosphorus within the lake may not reach acceptable levels for many decades or even a century.

According to the 1996 305(b) report (FDEP, 1996) for Lake Okeechobee, the major pollution sources for the lake include runoff from ranch and dairy operations in the north where pollution has elevated phosphorus and coliform bacteria concentrations and created a continuous algal bloom. In the south, historic backpumping of runoff from row crops and sugarcane has elevated nutrient and pesticide levels. The backpumping has mostly ceased but still occurs when water in the primary canal of the Everglades Agricultural Area (EAA) reaches 13 feet (flood-control levels). As a result, depending on location and seasonal rainfall or drought, the lake receives varying amounts of nutrients, substances creating high biological oxygen demand (BOD), bacteria, and toxic materials. Other pollutants include high levels of total dissolved solids, unionized ammonia, chloride, color, and dissolved organic chemicals.

Biological sampling indicated variable but generally eutrophic conditions. In recent years, several widespread algal blooms (one covering about 100 square miles) and at least one major fish kill (all of which were widely publicized) launched the environmental community and governmental agencies into intense investigation and analysis of the lake's problems. The Lake Okeechobee Technical Advisory Committee, formed to assess the situation and recommend solutions, determined that phosphorus from dairies and agriculture was a major cause of the noxious algal blooms and that levels should be reduced by 40 percent. A few others contended that the secondary cause of increased phosphorus is the flooding of hundreds of acres of perimeter wetlands after the SFWMD decided in the late 1970's to raise the lake's water level. The higher level also reduced valuable fish-spawning grounds and waterfowl feeding and nesting habitat.

In general, the water quality trends for the lake are stable at six sites, improved at two sites, and degraded at two sites. The best water quality observations were noted for the flow entering Fisheating Creek and along the west near wetlands, while the worst water quality conditions occurred in the south by agricultural areas, and to the northeast by Taylor Creek, Nubbin Slough and the St. Lucie Canal. The reported major pollution sources in this basin were dairies and agriculture. A generalized assessment of the lake shows the lake as having fair water quality conditions, except for Myrtle Slough which was shown to have poor water quality, and the extreme south-southwest section of the lake where good water quality conditions are described by the 305(b) report (FDEP, 1996).

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - LAKE OKEECHOBEE

Several watershed and in-lake cleanup projects are currently proposed (flow diversion projects for four Florida Statutes Chapter 298 Water Control Districts, diversion of flows from the 715 Farms area, and a critical project authorized pursuant to Section 528 of the Water Resources Development Act of 1996 – the Lake Okeechobee Water Retention/Phosphorus Removal Critical Project) to incrementally reduce inputs of nutrients to the lake. However, to sustain water quality improvements brought about by in-lake cleanup projects, pollutant source reduction programs, via agricultural land acquisition, and implementation of best management practices (BMPs) in the lake watershed must be implemented concurrently. The Florida Department of Environmental Protection (FDEP) is at present developing a Total Daily Maximum Load pollutant loading program which is expected to result in additional pollutant load reduction activities in watersheds flowing to Lake Okeechobee.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - MANATEE PROTECTION

The West Indian manatee (*Trichechus manatus*) is listed as a federally endangered species and is one of the most endangered species in Florida. As a response to recent manatee mortality trends associated with water control structures, this project will provide operational changes and implement the installation of a manatee protection system at seven sector gates at navigational locks near Lake Okeechobee. The beneficial outcome of this project will be the reduction of risk, injury, and mortality of the manatee. The seven sector gates include S-193 at Okeechobee and S-310 at Clewiston on Lake Okeechobee; St. Lucie Lock and Port Mayaca Lock on the St. Lucie Canal; and Moore Haven Lock, Ortona Lock, and W. P. Franklin Lock on the Caloosahatchee River. The mechanism proposed would use hydroacoustic and pressure sensitive devices that will immediately stop the gates when an object is detected between the closing gates. These systems will transmit an alarm and signal to stop the gate movement when a manatee is detected. When an object or manatee activates the gate sensors, the gate will stop and open approximately six inches to release a manatee. As a result, a manatee will be able to travel between the open gates. After the gate opens, the operator can fully close the gate unless an object remains between the gates. Then the opening process will repeat the cycle as the sensors are activated again. Due to these structural modifications, manatees will be at a significantly less risk as they encounter locks with a sector gate. The future without plan condition assumes that the automatic gate sensor devices are installed on these lock sector gates.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - LAKE OKEECHOBEE REGULATION SCHEDULE

Lake Okeechobee has undergone numerous changes since the initial construction of Herbert Hoover Dike. Today, the Lake Okeechobee's water level is managed to provide a range of desired purposes including, flood protection, water supply and environmental protection using "regulation schedules." In 1995, the SFWMD requested the USACE to study a range of regulation schedules intended to be more responsive to lake ecosystem, down stream users and receiving water bodies. Those studies are currently underway. Due to the uncertainty of the recommendation that will result from that study, the Restudy assumed the current schedule, known as Run 25, for hydrologic modeling of the future without plan condition.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - CRITICAL RESTORATION PROJECTS

Lake Okeechobee Water Retention/Phosphorus Removal

The project consists of design and construction of stormwater treatment areas (STAs) in the Taylor Creek Basin (200 acres) and in the Nubbin Slough Basin (1,100 acres) and the restoration of isolated wetland sites on ten agricultural parcels in the Okeechobee watershed. The purpose of the project is to capture and attenuate peak flows from portions of the watershed and to improve water quality. The total project cost is estimated to be $16.3 million.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - LAKE OKEECHOBEE

Lake Okeechobee is a Class I water body (potable water supply) according to Florida Administrative Code rule. Class I water bodies generally have the most stringent surface water quality and pollution control criteria in Florida. However, water quality data for Lake Okeechobee indicate that the lake is in a eutrophic condition, primarily due to excessive nutrient loads from agricultural sources both north and south of the lake.

The main tributary to Lake Okeechobee is the Kissimmee River. As stated above, several water bodies within the Kissimmee River Watershed, including segments of the river itself, are impaired to various levels. Degradation of water quality in the Kissimmee River Watershed contributes to downstream degradation in Lake Okeechobee. Lower reaches of the Kissimmee River contribute high levels of nutrient loading to Lake Okeechobee.

Another important tributary to the lake is the Taylor Creek/Nubbin Slough Basin. The Taylor Creek/Nubbin Slough Basin contributes high levels of nutrient loading, low

levels of DO, and elevated coliform bacteria and turbidity levels to the lake. The Taylor Creek/Nubbin Slough Basin contributes only 4 percent of the total volume of inflows to Lake Okeechobee, but accounts for approximately 29 percent of the total phosphorus inflow loads.

Eight segments of Lake Okeechobee are also included on the Section 303(d) list. Water quality parameters/criteria causing impairment at eight different monitoring locations in Lake Okeechobee include: excessive nutrients, low levels of DO, and high concentrations of unionized ammonia, iron, chlorides, and coliform bacteria. The Fisheating Creek and C-41 basins on the northwest side of the lake also contributes pollutants causing impairment in Lake Okeechobee.

Water quality in Lake Okeechobee is expected to slowly improve between 1999 and 2050. Field and laboratory studies of phosphorus stored in lake sediments indicate that sediment bound phosphorus is a dominant pollutant affecting lake water quality (Reddy et al., 1995). Currently, the average cumulative phosphorus load to the lake exceeds the Surface Water Improvement and Management Plan target by approximately 100 tons per year (SFWMD, 1997f). Phosphorus loads to the lake eventually become sequestered in lake sediments. The phosphorus in these sediments, which has accumulated over time from excessive external loads, is frequently resuspended (primarily by wind-aided mixing: Havens, 1997) and will tend to maintain a high phosphorus concentration in the water column, even if all sources of phosphorus in the contributing watershed are controlled consistent with regulatory and watershed management programs. Although short-term water quality conditions in Lake Okeechobee are not expected to improve, in place pollutant reduction programs in the lower Kissimmee River and Taylor Creek/Nubbin Slough basins are expected to result in long-term reduction in Lake Okeechobee water column nutrient concentrations.

Urban development in the Lake Okeechobee Watershed and nonpoint source pollution loading associated with urban stormwater runoff is not expected to increase significantly by 2050.

LAND USE - LAKE OKEECHOBEE REGION

Lake Okeechobee has traditionally been a key source of water supply for irrigated crops around the lake including the EAA, the Caloosahatchee River Basin, and Martin and St. Lucie counties (Upper East Coast). Continued access to this source of water is considered vital to sustaining agriculture in the surrounding regions.

Agriculture

The area is rural in character, with most lands dedicated to agriculture, very generally sugarcane is the predominant crop in the south, row crops and sugarcane in the east and pasture land with dairy production in the north. Urban areas, which are generally few and modest in population, service the agriculture sector, as well as the tourists who come to the lake to fish, hunt, and enjoy other recreational pursuits.

Urban

A significant use of land outside the agricultural context is for urban development. Six incorporated communities are situated around the lake and range in population from approximately 1,400 to 16,000.

The Brighton Seminole Indian Reservation occupies a large area of land west of the lake in Glades County. The southern end of this reservation is near the Herbert Hoover Dike just north of Lakeport.

Major transportation corridors around the perimeter of Lake Okeechobee include several highways and railroads. County Road 78 parallels the lake along its western and northern shores from Moore Haven to Okeechobee. From Okeechobee, State Highway 98/ 441 follows the northern and eastern portion of the lake to Pahokee. County Road 715 then follows the Herbert Hoover Dike from Pahokee to Belle Glade, where State Highway 27 follows the southern lake area back to Moore Haven and County Road 78. In many cases, these highways are within 1.6 kilometers (one mile) of the Herbert Hoover Dike, and are often within 15 meters (50 feet).

Railroad corridors in the Lake Okeechobee area include the Florida East Coast Railway and the South Central Florida Railroad. The East Coast Railway is located along the eastern part of the lake where it comes very near to the Herbert Hoover Dike. The South Central Florida Railroad travels along the southern end of the lake, where it comes within 1.6 kilometers (one mile) of the Herbert Hoover Dike.

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

1a - North of Lake Okeechobee Storage Reservoir (A)

This separable element includes an above ground reservoir and a 2,500-acre stormwater treatment area. The total storage capacity of the reservoir is approximately 200,000 acre-feet and is located in the Kissimmee River Region, north of Lake Okeechobee. The specific location of this facility has not been identified, however, it is anticipated that the facility will be located in Glades, Highlands, or Okeechobee counties. The initial design of this separable element assumed a 20,000-acre facility (17,500-acre reservoir and 2,500-acre treatment area) with water levels in the reservoir fluctuating up to 11.5 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning, land suitability analyses, and design. Future detailed planning and design activities will also include an evaluation of degraded water bodies within the watersheds of the storage/treatment facility to determine appropriate pollution load reduction targets, and other water quality restoration targets for the watershed.

The purpose of this facility is to detain water during wet periods for later use during dry periods and reduce nutrient loads flowing to the lower Kissimmee River and

Lake Okeechobee. This increased storage capacity will reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the lake's littoral ecosystems and cause large discharges from the lake that are damaging to the downstream estuary ecosystems. Depending upon the proposed location(s) of this water storage/treatment facility and pollutant loading conditions in the watershed(s), the facility could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets.

The operation of this separable element assumes that water from Lake Okeechobee, the Kissimmee River or the S-65E Drainage Basin will be pumped into the storage reservoir/stormwater treatment area when the climate-based inflow model forecasts that the lake water levels will rise significantly above desirable levels for the lake littoral zone. Water held in the reservoir and stormwater treatment area will not be released until the lake levels decline to ecologically acceptable levels.

1c - Lake Okeechobee Watershed Water Quality Treatment Facilities (OPE)

This separable element includes two reservoir-assisted stormwater treatment areas and plugging of select local drainage ditches. The initial design of these reservoir-assisted stormwater treatment areas assumes a 1,775-acre facility in the S-154 Basin in Okeechobee County and a 2,600-acre facility in the S-65D subbasin of the Kissimmee River Basin in Highlands and Okeechobee counties. The plugged drainage ditches will result in restoration of approximately 3,500 acres of wetlands throughout the Lake Okeechobee basin. This separable element is also consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team for achieving water quality restoration objectives in the lake and should provide significant long-term water quality benefits for the lake.

The other portion of this separable element includes the purchase of conservation easements within four key basins of Lake Okeechobee to restore the hydrology of isolated wetlands by plugging the connection to drainage ditches and the diversion of canal flows to adjacent wetlands. The sites range in size from an individual wetland to an entire subbasin and are located within the lower Kissimmee River Basins (S-65D, S-65E, and S-154) and Taylor Creek/Nubbin Slough Basin (S-191).

The purpose of this separable element is to attenuate peak flows and retain phosphorus before flowing into Lake Okeechobee. Further, many of the wetlands in the Lake Okeechobee watershed have been ditched and drained for agriculture water supply and flood control. This separable element will restore the hydrology of selected isolated and riverine wetlands in the region by plugging these drainage ditches.

The South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team identified six primary tributary basins (C-41 Basin, Fisheating Creek, Taylor Creek/Nubbin Slough, S-154 Basin, S-65D (Pool D) Basin, S-65E (Pool E) Basin) contributing significant phosphorus loads to the lake. In order to further reduce nutrient

loading to Lake Okeechobee in support of the water quality goals for the lake, articulated in the Lake Okeechobee Surface Water Improvement Management Plan, there are potentially other reservoir assisted stormwater treatment area facilities needed in the Lake Okeechobee Watershed (such as in the C-41 and Fisheating Creek basins) that are not included in this construction separable element. Therefore, it is proposed that a comprehensive plan for the Lake Okeechobee watershed is developed before the final configuration of this construction separable element is implemented. A comprehensive Lake Okeechobee watershed plan would include elements of the Lake Okeechobee Surface Water Management Plan and remediation programs developed to achieve appropriate pollution reduction targets established for the lake.

1d - Lake Okeechobee Tributary Sediment Dredging (OPE)

This separable element includes the dredging of sediments from 10 miles of primary canals within an eight-basin area in the northern watershed of Lake Okeechobee. The initial design assumes that the dredged material will contain approximately 150 tons of phosphorus.

The purpose of this separable element is to remove phosphorous in canals located in areas of the most intense agriculture in the Lake Okeechobee watershed. These sediments presently contribute to the excessive phosphorus loading to Lake Okeechobee. Under separate funding, the SFWMD is planning a demonstration project consisting of sedimentation traps to determine the feasibility of phosphorous removal by this method. The project will be a two-year demonstration with construction starting in FY2000. Upon completion in 2001, the traps will be operated and monitored to determine effectiveness. If feasible, findings from this demonstration will be incorporated into the design for this separable element. This separable element is also consistent with the water quality restoration goals for the lake included in the Lake Okeechobee Surface Water Management Plan and subsequently developed by the Lake Okeechobee Issue Team. Implementation of this separable element will also complement other activities associated with pollution reduction for the lake.

Chapter 4
CALOOSAHATCHEE RIVER/SOUTHWEST FLORIDA REGION

PHYSICAL CONDITIONS - CALOOSAHATCHEE RIVER/ SOUTHWEST FLORIDA REGION

The Caloosahatchee River/Southwest Florida Region covers approximately 4,000 square miles in Lee, Hendry, Glades, and Collier counties and a portion of Charlotte County. This area is generally bounded by Charlotte County to the north, Lake Okeechobee and the Everglades Agricultural Area (EAA) to the east, the Big Cypress National Preserve (BCNP) to the south, and the Gulf of Mexico to the west. The area is characterized by the sandy flatlands region of Lee County, which give way to sandy though more rolling terrain in Hendry County; and the coastal marshes and mangrove swamps of Collier County.

The Caloosahatchee River Basin includes an area of 550,900 acres in parts of Lee, Glades, Charlotte, and Hendry counties. From a hurricane gate on the southwest shore of Lake Okeechobee at Moore Haven, the Caloosahatchee Canal drains westerly for about 5 miles through a very flat terrain into Lake Hicpochee. From there the canal joins the upper reach of the Caloosahatchee River. On its way to the Gulf of Mexico, the river is controlled by navigation locks at Ortona (15 miles downstream from Moore Haven) and at Olga near Fort Myers. Downstream from Ortona Lock, many tributaries join the river along its course to the gulf. The Caloosahatchee River serves as a portion of the cross-state Okeechobee Waterway, which extends from Stuart on the east coast via the St. Lucie Canal, through Lake Okeechobee and the Caloosahatchee River to Fort Myers on the Gulf of Mexico. The river has been straightened by channelization through most of its 65-mile course from the Moore Haven Lock to Fort Myers.

The J. N. "Ding" Darling National Wildlife Refuge (NWR) Complex includes Pine Island NWR, Island Bay NWR, Matlacha Pass NWR, and Caloosahatchee NWR, all located on the lower west coast. The health of the estuarine ecosystem they embody is directly tied to the water quality, quantity and timing of flows from the Caloosahatchee Watershed and those watersheds which drain into the Caloosahatchee River (i.e., Kissimmee River and Lake Okeechobee watersheds).

EXISTING CONDITIONS - CALOOSAHATCHEE RIVER REGION WATER MANAGEMENT

Inflows from Lake Okeechobee and runoff from within its own basin supply the Caloosahatchee River. The freshwater portion of the river (C-43 Canal) extends westward from Moore Haven, on Lake Okeechobee, through LaBelle, to the Franklin Lock and Dam (S-79). The C-43 Canal is part of the Lake Okeechobee Waterway, providing navigation

between the east and west coasts of Florida. West of S-79, the river mixes freely with estuarine water as it empties into the Gulf of Mexico (SFWMD, 1995; SFWMD, 1997). C-43 is 45 miles long, averages 20 to 30 feet deep and ranges from 150 to 450 feet wide. The Ortona Lock and Dam (S-78), located approximately 27 miles upstream of S-79, separates the freshwater portion of the river into the East and West Caloosahatchee basins. Roughly 40 percent of the drainage area is in the east basin, and the remaining 60 percent is in the west basin. The total drainage area to the river between S-77 and S-79 is about 880 square miles (CDM, 1991).

The Caloosahatchee River Region is part of the Lake Okeechobee Service Area. The Lake Okeechobee Service Area subbasins lie at critical intermediary points in the water management system of South Florida. The needs of the Okeechobee subbasin for flood protection and drainage services affect inflows to the Caloosahatchee Estuary. Excessive discharges of fresh water to the Caloosahatchee Estuary are caused by regulatory releases from Lake Okeechobee and runoff from each local watershed (SFWMD, 1997).

The Lake Okeechobee regulation schedule determines the timing and quantity of water that is released from the lake into the Caloosahatchee River, depending on lake water surface elevation and season. The current lake regulation schedule allows the lake to peak at 16.75 feet on September 30th. The stored water is intended for water supply during the dry season. The lake regulation schedule is often called a 15.65 to 16.75 feet regulation schedule because of these key low and high lake stages. When lake levels exceed the highest allowable elevation (generally during flooding rainfall events), rapid releases of large volumes of water occur down both the Caloosahatchee River and St. Lucie Canal. At intermediate elevations, lower continuous releases of water occur. Timing and duration of releases are set by a targeted discharge volume from Lake Okeechobee, which in turn is set according to the lake level. Maximum water releases through the Caloosahatchee may be up to 9,300 cfs. Lake Okeechobee regulatory releases are made after the peak of the local inflow has passed. Lower, but continuous flows occur under "Zone B" or "Zone C" conditions. Minor rainfall events lead to smaller, pulsed discharges, intended to mimic natural rainfall events.

Continuous discharges to the Caloosahatchee and St. Lucie estuaries have caused documented negative effects on estuarine ecology (Chamberlain et al., 1995; Haunert and Startzman, 1985; Chamberlain and Hayward, 1996). Research has shown that prolonged releases, even at the modest Zone C rates, transform the estuarine systems into freshwater habitats within three to four weeks. The dramatic and rapid changes in salinity, and associated siltation caused by the release of suspended solids and precipitation of dissolved organic matter at the freshwater/saltwater interface, can produce long-term negative effects on these estuaries. In addition, continuous flow releases at these levels tend to create critically low benthic oxygen concentrations at the transitional zone between fresh water and the ocean or gulf. High, continuous releases generate even more problems, because of greater potential for environmental disruption and associated public concern. Even with a thorough understanding of these major environmental concerns, flood control remains a major purpose of the man-made structures, and regulatory

discharges are sometimes necessary because of the high risk of loss of life and property associated with high lake stages and hurricane generated waves and tides.

Problems Related to Water Management

During the annual November to April dry season, little water is released into the river from the lake, resulting in low flows and low water levels in the upper Caloosahatchee. Two problems may develop as a consequence: First, low flow may lead to development of an occasional severe algal bloom in the river above Franklin Lock (S-79) and Dam. The city of Fort Myers and Lee County both have municipal water intakes in this area. Short-term high rates of discharge from Lake Okeechobee are used to break up the blooms by the United States Army Corps of Engineers (USACE) whenever requested by the South Florida Water Management District (SFWMD) (USACE, 1991). During the extreme driest months (April-May) river flow may drop to near zero. When this occurs, navigation lockages through the W. P. Franklin Lock (S-79) allow a saltwater wedge to move upstream. If salt intrusion is too severe, the SFWMD requests the USACE to flush out the salt water with a short-term high rate of discharge from Lake Okeechobee. During a declared water shortage period, the SFWMD requests the USACE to go to reduced hours of lockages (USACE, 1991).

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - CRITICAL RESTORATION PROJECTS

Lake Trafford Restoration

Lake Trafford is located in north Collier County and is the largest lake south of Lake Okeechobee with a surface area of approximately 1,500 acres. It is the headwaters of the Corkscrew Swamp Sanctuary to the southwest, the Corkscrew Regional Ecosystem Watershed (CREW) to the west, and the Florida Panther National Wildlife Refuge to the south. Lake Trafford has poor water quality, extensive muck accumulations, loss of native submergent plant communities, and numerous fish kills. The project involves removal of approximately 8.5 million cubic yards of loose, flocculent organic sediments that blanket the bottom of the lake, and transport of these sediments to a sediment disposal site through a temporary pipeline. The total project cost is $17.5 million.

Southern CREW/Imperial River Flowway

The project is located in southern Lee County bordering the western boundary of the Corkscrew Regional Ecosystem Watershed (CREW). The environmentally sensitive area east of Bonita Springs has been altered by the construction of roads, house pads, agricultural berms and ditches. These alterations have resulted in restriction of historical sheetflow, unnatural water impoundment and flooding, increased pollutant loading to the Imperial River and Estero River, and disruption of natural wetland functions. The project involves acquisition of approximately 4,670 acres and restoration of historic sheetflow by

removal of canal and road berms, home pads and ditches. The project also involves replacement of the Imperial Bonita Estates Bridge and modifications to the Kehl Canal Weir.

The project is divided into the following 3 phases: Phase I consists of construction of the Kehl Canal Weir Modification. Phase II consists of land acquisition and restoration of historic flows over Sections 25, 26, 35, 36 and the SE 1/4 of Section 24, T47S, R26E, approximately 2,720 acres. Phase III consists of land acquisition and restoration of historic flows over Sections 32, 33 and 34, T47S, R26E and the flowway starting at Section 32 downstream to Matheson Street, approximately 2,040 acres. The estimated project cost is $26.1 Million, of which $12.1 million will be cost-shared under a PCA with the USACE and the remaining $14 million for land acquisition will be cost-shared under a separate agreement with the United States Department of the Interior (USDOI).

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - CALOOSAHATCHEE RIVER/SOUTHWEST FLORIDA REGION

The SFWMD's Caloosahatchee Water Management Plan is the main watershed management program that is likely to result in water quality improvement activities in the basin (SFWMD, 2001). In the future, although implementation of new Lake Okeechobee regulation schedules and the Caloosahatchee Water Management Plan will reduce pollutant loading to the Caloosahatchee River/Estuary, in general, water quality conditions throuhout the basin in the future without plan condition are expected to be similar to current water quality conditions.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - CALOOSAHATCHEE RIVER/SOUTHWEST FLORIDA REGION

The Florida Department of Environmental Protection (FDEP) listed approximately 14 water body segments in the Caloosahatchee River Basin and in downstream coastal waters on its 1998 303(d) list. Water quality parameters of concern include excessive nutrients, coliform bacteria, biochemical oxygen demand (BOD), and depressed levels of dissolved oxygen (DO). As with the Big Cypress Basin, the number of monitoring locations in coastal waters of the region used to prepare the 305(b) Report is probably inadequate to accurately characterize the extent of water quality degradation in coastal areas. Extensive urban development (Fort Myers and vicinity, Cape Coral) at the mouth of the Caloosahatchee River contributes significant point and nonpoint source pollution loads into coastal canals and downstream into the Caloosahatchee Estuary.

In 2050, water quality conditions in the upper (eastern) and central portions of the watershed are expected to be unchanged compared to existing conditions. Water quality in downstream coastal areas is expected to decline as a result of increased population growth and urban and agricultural development. Water quality impacts from increased agricultural development are expected to be most readily observed in downstream areas of the watershed. The projected increase in population growth in urban areas of the

Caloosahatchee River Basin is expected to exacerbate existing water quality problems in coastal waters, particularly those associated with wastewater discharges. Offsetting the coastal development and inland agricultural development water quality impacts is the implementation of a different regulatory schedule for Lake Okeechobee, which is expected to improve water quality conditions in the Caloosahatchee River and estuary by reducing the frequency and volume of large quantities of nutrient/sediment laden Lake Okeechobee flood regulation waters.

LAND USE - CALOOSAHATCHEE RIVER/SOUTHWEST FLORIDA REGION

The Caloosahatchee River Region has 169,660 acres of urban land, largely fixed single family units (69,172 acres) and an almost equal number of acres in some stage of construction. There are 355,125 acres of agriculture with improved and unimproved pastures (163,348 acres), citrus groves (92,410 acres), and sugarcane (67,628 acres) predominant. Various types of rangeland make up 51,663 acres of land use. The category of barren land has 10,000 acres. This includes spoil and borrow areas (7,090 acres) and rural land in transition (2,377 acres). Transportation, communication, and utilities comprise 16,280 acres.

Rangeland and agriculture dominate land use in the basin, particularly the upper portion (FDEP, 1996). The freshwater portion of the Caloosahatchee River Region is mostly agricultural. The only urban areas are the cities of LaBelle, Alva, and Moore Haven (CDM, 1991). Land use adjacent to the Caloosahatchee River Estuary is largely residential and urban with the city of Cape Coral on its northern bank and the highly urbanized city of Fort Myers on its south bank. Both of these communities have experienced rapid growth, with even more growth anticipated in the near future (SFWMD, 1997).

Agriculture

Glades and Lee counties are included in this region. Almost one-half million acres are farmed in the Caloosahatchee River Basin, and approximately three-fourths of that area is pasture land (UFBEBR, 1995). The region is characterized by large farms averaging 1,800 acres, with relatively low productivity per acre (UFBEBR, 1995). Glades County ranks eighth in the state of Florida for cattle production (FASS, 1996a). Citrus production in the Caloosahatchee River Basin covers more than 20,000 acres (FASS, 1996b) and is currently increasing. Much of this acreage is likely categorized as unique farmland based upon its location, growing season, and high value citrus crops.

Almost 5,000 people are employed in agricultural production and services, and the payroll totals approximately $5 million (UFBEBR, 1995). Agricultural products in this region have a total market value of more than $135 million (UFBEBR, 1995).

More than 77,000 acres of farmland are irrigated in the Caloosahatchee River Basin (UFBEBR, 1995). Reliable water supply is a big concern in this region which has

traditionally relied upon water deliveries through the Caloosahatchee River from Lake Okeechobee. Irrigation demands can be expected to increase as additional land is used for citrus production.

Chapter 5
UPPER EAST COAST REGION

PHYSICAL CONDITIONS - UPPER EAST COAST REGION

The Upper East Coast Region encompasses approximately 1,139 square miles and includes most of Martin and St. Lucie counties as well as a portion of eastern Okeechobee County. Martin and St. Lucie counties are bounded to the east by the Atlantic Ocean, and a substantial portion of Martin County borders Lake Okeechobee. Urban development is primarily located along the coastal areas while the central and western portions are used primarily for agriculture where the main products are citrus, truck crops, sugarcane, and beef and dairy products.

The land is generally flat, ranging in elevation from 15 to 60 feet NGVD (National Geodetic Vertical Datum) in the western portion with an average elevation of 28 feet. The coastal area ranges from sea level to 25 feet. The coastal sand hills adjacent to the Atlantic Intracoastal Waterway are higher than most parts of the county and reach a maximum elevation of 60 feet. This feature is known as the Atlantic Coastal Ridge.

The natural drainage has been significantly altered by the construction of canals, drainage ditches and numerous water control structures which predominately direct stormwater discharge to the east coast. The area contains the the Central and Southern Florida Flood Control Project (C&SF Project) canals C-23, C-24, and C-25 drainage basins and the drainage area served by C-44 (St. Lucie Canal).

The St. Lucie Canal is Lake Okeechobee's eastern outlet, extending 25.5 miles from Port Mayaca to the city of Stuart, where it terminates at the South Fork of the St. Lucie River. The St. Lucie River Basin is part of a much larger southeastern Florida basin that drains over 8,000 square miles. The St. Lucie River, composed of the North and South forks, lies in Martin and St. Lucie counties in the northeastern portion of the basin. The South Fork is a relatively short stretch of river. The North Fork, designated as an aquatic preserve by the state of Florida, begins south of Fort Pierce and flows past the city of Port St. Lucie to the St. Lucie River Estuary.

The St. Lucie Estuary is part of a larger estuarine system known as the Indian River Lagoon (IRL). The lagoon has been designated an estuary of national significance and is a component of the United States Environmental Protection Agency (USEPA) sponsored National Estuary program. The lagoon is also designated as a state priority water body for protection and restoration under the state's Surface Water Improvement and Management (SWIM) Act. The SWIM Act Plan identifies excessive freshwater runoff from the St. Lucie Estuary Watershed as a problem within the St. Lucie Estuary.

Much of the St. Lucie River has been channelized and many drainage canals empty into the river, particularly the St. Lucie Canal, C-23, and C-24. The St. Lucie Canal, the largest overflow canal for Lake Okeechobee, is a navigation channel 8 feet deep and 100

feet wide connecting the Atlantic Intracoastal Waterway in Stuart with Lake Okeechobee at Port Mayaca.

EXISTING CONDITIONS - UPPER EAST COAST/INDIAN RIVER LAGOON (IRL) WATER MANAGEMENT

The St. Lucie Estuary is located on the southeast coast of Florida, encompassing portions of both Martin and St. Lucie counties within the watershed. The two forks of the St. Lucie Estuary, the North Fork and South Fork, flow together near the Roosevelt Bridge at the city of Stuart, and then flow eastward approximately 6 miles to the IRL and Atlantic Ocean at the St. Lucie Inlet. Tidal influences in the North Fork reach 15 miles north of Stuart in Five-Mile Creek, and to a water control structure on Ten-Mile Creek just west of the Florida Turnpike at Gordy Road. Tidal influences in the South Fork extend about 8 miles south of Stuart to the St. Lucie Lock and Dam on the St. Lucie Canal. Tidal influence also extends into the extremes of the nearby Old South Fork tributary (Morris, 1987).

The estuary is divided into three major areas, the inner estuary, composed of the North and South forks; the midestuary, consisting of the area from the juncture of the North and South forks to Hell's Gate, and the outer estuary extending from Hell's Gate to the St. Lucie Inlet. The main body of the North Fork is about 4 miles long, with a surface area of approximately 4.5 square miles and a total volume of 998.5×10^6 cubic feet at mean sea level. The South Fork is approximately half the size of the North Fork with a surface area of about 1.9 square miles and a volume of 468.7×10^6 cubic feet. The midestuary extends approximately 5 miles from the Roosevelt Bridge to Hell's Gate and has an area and volume similar to the North Fork (4.7 square miles and 972.7×10^6 cubic feet) (Haunert and Startzman, 1985).

Surface sediment composition within the estuary has been mapped by the District (Haunert, 1988). Sediment composition within the St. Lucie Estuary is influenced by hydrodynamics and is somewhat correlated to depth. Sand substrates, with little organic content, are found along the shallow shorelines of the estuary and in the St. Lucie Canal. This reflects the impacts of wave turbulence and rapid currents. Substrates comprised of mud and moderate quantities of sand are present in areas that are more typically low energy environments, but subjected to occasional high energy events. Mud substrates are found in low energy areas such as dredged areas and the deeper portions of the estuary. These mud sediments often contain high concentrations of organic materials.

While the estuary encompasses about 8 square miles, the watershed covers an area of almost 775 square miles. The watershed is divided into eight basins; five major basins and three minor ones. Three of these major basins, the C-23, C-24, and C-44, represent basins now linked to the estuary by components of the Central and South Florida Flood Control Project. In addition to drainage from within the C-44 Basin, the C-44 Canal (St. Lucie Canal) also conveys flood control discharges from Lake Okeechobee to the St. Lucie Estuary. The other two major basins, the North Fork, and Tidal Basin, include numerous connections to the St. Lucie Estuary.

Agricultural drainage and residential development have extensively modified the watershed of the entire St. Lucie Estuary. One major effect of these man-made alterations in the landscape and water management practices is increased drainage, manifested by a lowered ground water table and dramatic changes in how stormwater runoff is introduced to the estuary. Typically, when a watershed is highly drained like the St. Lucie Estuary Watershed, all three runoff factors (quality, quantity, and timing) are negatively affected. From a yearly cycle perspective, the quantity of water drained to the estuary is increased, the water quality is degraded and the seasonal distribution of runoff is altered such that dry season flows are of less magnitude and frequency and wet season flows are of greater magnitude and more frequent. The vast majority of runoff occurs within the first three days after a rainfall event rather than over an extended period of time. Water quality is degraded, especially by increased amounts of nutrients and suspended solids. The increased nutrients in the St. Lucie Estuary have increased primary productivity within the system to the point where unhealthy levels of dissolved oxygen (DO) occur on a regular basis in the inner estuary. The dramatic increase in sediment load has contributed significantly to the build-up of muck throughout the system. The sandy sediment loads like those that build up in the Palm City area are from primarily high discharge events. However, it is the increased organics coming from high levels of chlorophyll a and floating aquatics introduced from the canals combining with highly organic fine suspended sediments that flocculate out at the freshwater-saltwater interface that lead to the formation of muck. As a result, the benthic environment of the estuary is a favorable habitat for mostly pollution tolerant organisms. In addition, the rapid introduction of fresh water causes salinity fluctuations that are not conducive to developing or maintaining a healthy estuarine plant and animal community. The overall result of these changes is the loss of important habitats.

The St. Lucie Estuary has received increased inflows over the last 100 years because of these modifications to the watershed. Extreme salinity fluctuations and ever-increasing inflows have contributed to major changes in the structure of the communities within the estuary such as seagrass and oyster losses. Phillips (1961) described the marine plants in the St. Lucie Estuary. At the time, mangroves were abundant in the North and South forks and seagrasses, although stressed, were still found in many areas of the estuary. Today, the presence of seagrasses is severely limited and ephemeral. Oyster populations in the estuary are virtually nonexistent due to the continual exposure to low salinities and lack of suitable substrate (clean hard objects) for larval recolonization (Haunert and Startzman, 1980 and 1985).

Regulatory discharges from the C-44 Canal have been documented to adversely impact the St. Lucie Estuary by depressing the salinity range far below the normal range, and by transporting large quantities of suspended materials into the estuary. Sedimentation problems in relation to C-44 Canal discharges were recognized as early as the 1950's (Gunter and Hall, 1963). While current monthly average flows from the watershed to the St. Lucie Estuary seldom exceed 2,500 cfs, regulatory releases from the C-44 Canal alone have produced flows in excess of 7,000 cfs. The quantity of suspended solid material passing Structure S-80 has reached a peak of 8,000 tons a day when daily discharges reached near 7,000 cfs in 1983. Much of this material passes through the estuary and into

the IRL or Atlantic Ocean (Haunert, 1988). It was recognized then that these discharges transported sand as well as very fine, organic rich suspended material to the estuary.

Surface Water Resources

Prior to development, most of the Upper East Coast Planning Area was characterized by nearly level, poorly drained lands subject to frequent flooding. The natural surface drainage systems included large expanses of sloughs and marshes such as St. Johns Marsh, Allapattah Slough (also referred to as Allapattah Flats), and Cane Slough. Drainage systems with higher conveyance included the North and South forks of the St. Lucie River, Ten Mile Creek, Five Mile Creek, the Loxahatchee River, and Bessey Creek. Minor creeks include Danforth, Fraiser, Hidden River, Willoughby, Krueger, Mapps, and Warner. Most of these surface water systems, especially those with poor drainage, have been altered to make the land suitable for development and to provide flood control.

Since the early 1900s, numerous water control facilities have been constructed to make this region suitable for agricultural, industrial, and residential use. The St. Lucie Canal (C-44) was constructed between 1916 and 1924 to provide an improved outlet for Lake Okeechobee floodwaters. From 1918 to 1919, the Fort Pierce Farms Drainage District (FPFDD) and the North St. Lucie River Drainage District (NSLRDD) were formed to provide flood control and drainage for citrus production in eastern and northeastern St. Lucie County. The C-25 Canal (also known as Belcher Canal) provided a drainage outlet for the FPFDD, as well as limited flood protection for western areas of the basin. The C-24 Canal (also known as the Diversion Canal) provided drainage and limited flood protection west of the NSLRDD protection levee. The C-23 Canal provided water control in Allapattah Flats during the dry season. However, large areas continued to be under water for months at a time during the wet season.

Although the primary function of the C&SF Project was for flood control and drainage, the drainage network formed by the C&SF Project canals and the secondary canals and ditches has become an important source of irrigation water and frost protection for agriculture. In general, water stored in the canals is replenished by rainfall, ground water inflow, and withdrawals from the FAS when needed.

Prior to the large-scale expansion of citrus in the 1960s, storage in the drainage network in St. Lucie County was adequate to meet irrigation demands. However, the drainage and development of the large marsh areas in western St. Lucie County have depleted much of the surface water storage. The lowering of water tables also reduced the amount of water in ground water storage. The reduction of surface and ground water storage coupled with increased acreages of citrus have resulted in inadequate supplies of surface water to meet demands during droughts. Therefore, an equitable distribution of the available surface water in the C-23, C-24, and C-25 basins is maintained by limiting the invert elevation of irrigation culverts and the intake elevation of pumps to a minimum of 14.0 feet NGVD. Artesian well water from the FAS is used as an irrigation supplement when surface water supplies become limited. Due to the high mineral content of the

Floridan aquifer, this water is generally blended with surface water before it is used as irrigation water.

Surface Water Inflow and Outflow

Within the Upper East Coast Planning Area basins, essentially all surface water inflows and outflows are derived from rainfall. The exception to this is the St. Lucie Canal (C-44), which also receives water from Lake Okeechobee. In addition, most of the flows and stages in the region's canals are regulated for water use and flood protection. The amount of stored water is of critical importance to both the natural ecosystems and the developed areas in the Upper East Coast Planning Area. Management of surface water storage capacity involves balancing two conflicting conditions. When there is little water in storage, drought conditions may occur during periods of insufficient rainfall. Conversely, when storage is at capacity, flooding may occur due to excessive rainfall, especially during the wet season. Management of surface water systems is one of the main factors affecting movement of water through the regional hydrologic cycle.

Ground Water Resources

A distinctive feature of South Florida's hydrologic system is the aquifer system and its use for water supply. Two vast aquifer systems, the Surficial Aquifer System (SAS) and the Floridan Aquifer System (FAS), underlie the Upper East Coast Planning Area. Ground water inflows from outside the planning area form an insignificant portion of recharge to the SAS. Rainfall is the main source of recharge, and because of this, long-term utilization of this source must be governed by local and regional recharge rates. The FAS, on the other hand, receives most of its recharge from outside of the Upper East Coast Planning Area. This fact must also be incorporated into long-term planning decisions. Within an individual aquifer, hydraulic properties and water quality may vary both vertically and horizontally. Ground water supply potential varies greatly from one place to another.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - CRITICAL RESTORATION PROJECTS

Ten Mile Creek Water Preserve Area

The project is located just south of Ten Mile Creek in St. Lucie County. Ten Mile Creek is the largest subbasin delivering water to the North Fork of the St. Lucie River Estuary (SLE). The SLE discharges into the IRL which is the most biologically diverse estuary in North America and has been designated as an Outstanding Florida Water. The entire lagoon is endangered from increased runoff from watershed drainage fluctuations. Excess stormwater due to drainage improvements is causing radical fluctuations of the salinity of the SLE resulting in elimination of viable habitat suitable for oysters, seagrasses and marine fish spawning.

The project involves acquisition of approximately 920 acres of land and construction of a water preserve area to attenuate flows and improve water quality discharge to the SLE/IRL. The project features a two-stage detention system consisting of a Water Preserve Area (WPA) and polishing cell. A series of large pumps will deliver water from Ten Mile Creek into the WPA during high water at a rate of 380 cfs. Water will be stored in the 550 acre WPA and then metered out through a 40 cfs spillway into a polishing cell of 134 acres. The deep-water storage cell will allow for storage of up to 5,000 acre-feet. The total estimated project cost is $29.1 million.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - UPPER EAST COAST

Several ongoing watershed management/planning programs in the Upper East Coast and IRL area are expected to be completed which would beneficially affect water quality conditions in the St. Lucie River and Estuary, IRL and other freshwater water bodies in the area. The South Florida Water Management District (SFWMD) IRL SWIM has developed numerous programs and objectives to improve water quality conditions in the area. Many of the water quality remediation activities being implemented by the SWIM Plan focus on reducing agricultural pollutant loads in the IRL Watershed and urban/suburban pollutant loads in the rapidly developing coastal region surrounding the St. Lucie Estuary and IRL. Implementation of more environmentally sensitive Lake Okeechobee regulation schedules should also reduce pollutant loading to the St. Lucie Estuary/IRL systems. The IRL National Estuary Program, jointly administered by the USEPA and the state of Florida will also result in water quality improvement activities and a reduction of pollutant loads to the IRL in the future. In summary, as a result of these ongoing watershed management programs, water quality in the Upper East Coast is expected to improve in the future.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - UPPER EAST COAST AND INDIAN RIVER LAGOON (IRL)

The Upper East Coast Region includes Martin and St. Lucie counties and a small portion of Okeechobee County. The principal water body is the IRL, which includes the St. Lucie River. The Upper East Coast is hydrologically connected to the Everglades and Florida Bay ecosystems through the C-44 (St. Lucie) Canal. The IRL is a SWIM priority water body. Most of the Upper East Coast Watershed consists of Class III waters; however, there are small areas of Class II waters (shellfish propagation or harvesting) within the watershed. Class II waters are generally afforded greater protection than Class III waters. Currently, nine locations in the St. Lucie (C-44) Canal, the North and South forks of the St. Lucie River, and several subbasins draining to the IRL are listed by the Florida Department of Environmental Protection (FDEP) on the 1998 303(d) list of impaired water bodies. Pollutants/constituents causing impairment include: low levels of DO, excessive nutrients, high levels of total suspended solids (TSS), high biochemical oxygen demand (BOD), coliform bacteria, and mercury (based on fish consumption advisories). There are an additional eight monitoring locations in the southern IRL area

also included on the 1998 303(d) list. In addition to the above-listed constituents, copper and turbidity were identified to be causing use impairment at some of the monitoring sites.

Overall, water quality conditions in the Upper East Coast and the IRL are expected to be somewhat improved by 2050, compared to existing conditions. Lake Okeechobee freshwater discharges via the St. Lucie Canal (C-44) alter ambient salinity levels and deliver nutrients and other pollutants contained in Lake Okeechobee water and runoff from localized sources (agricultural and urban) to the estuary. The C-23/C-24/C-25 Canal system in St. Lucie County facilitates drainage to sustain agricultural (primarily citrus groves) and urban development in the vicinity of those canals. Implementation of a different regulation schedule for Lake Okeechobee is also expected to improve water quality conditions in the IRL Estuary by reducing the frequency and volume of fresh water delivered to the estuary. It is also expected that agricultural nonpoint source pollution loads delivered to the estuary via secondary and tertiary canals connected to C&SF Project canals will be reduced compared to existing conditions through the implementation of agricultural best management practices (BMPs) and the conversion of some agricultural lands to other uses (e.g., conservation, urban/suburban development). The efforts of the IRL Save Our Rivers (SOR) project and St. Lucie County Mosquito Control have significantly improved water quality in the eastern lagoon through the use of mosquito impoundments.

The extent of urbanization in the watershed is expected to increase by 2050. New growth and development in the watershed will be regulated to comply with water quality regulations governing point and nonpoint source discharges; however, the net pollution load contributed to the St. Lucie River and the IRL system from these sources is expected to increase compared to existing conditions. Ongoing and planned pollutant load reduction activities in the Upper East Coast Region should help offset additional pollutant loads expected to occur from future urbanization.

LAND USE

Upper East Coast and Indian River Lagoon (IRL)

The record of human existence in the Upper East Coast Region spans approximately 8,000 years. The lagoon system provided the Indians and early settlers with food, materials for tools and their major means of transportation. In the late 1800s, the IRL Region was already established as a major area of commerce (tourism, fisheries, shipping and agriculture). The lagoon was used for safe harbor and transportation of cargo, especially citrus.

At present, the dominant land use in the basin is agriculture (covering approximately 45 percent of the basin). Agricultural activities include 228,000 acres of (NRCS, 1994). The present urban land use (17 percent of the basin) is concentrated along the coast and the lagoon shorelines. Urban growth is rapidly extending westward, replacing agricultural land. Future land use patterns indicate that this trend will continue as urbanization intensifies along the coast, especially in the southern counties (Swain and

Bolohassen, 1987). Present forested uplands and wetlands comprise 11 and 18.8 percent of the basin, respectively.

Agriculture - Upper East Coast

Martin and St. Lucie counties are included in this region. Almost one half million acres are farmed (UFBEBR, 1995). St. Lucie and Martin counties rank first and eighth, respectively, among Florida counties for number of acres of citrus (FASS, 1996b). Although this area is known primarily for its citrus production, many acres are used for pasture land. Farms average 600 acres in size with moderate productivity per acre (UFBEBR, 1995). More than 7,500 people are employed in agricultural production and services with a payroll of approximately $9.5 million (UFBEBR, 1995). The market value of all agricultural products in this region totals approximately $362 million (UFBEBR, 1995). Approximately 200,000 acres are irrigated (UFBEBR, 1995) requiring a dependable water supply. Lake Okeechobee has traditionally been the water source for this region.

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

7a - C-44 Basin Storage Reservoir (B)

This separable element includes an above ground reservoir with a total storage capacity of approximately 40,000 acre-feet located in the C-44 Basin in Martin County. The initial design of the reservoir assumed 10,000 acres with water levels fluctuating up to 4 feet above grade. The final location, size, depth and configuration of this facility will be determined through more detailed analysis to be completed as a part of the ongoing IRL Feasibility Study.

The purpose of this separable element is to capture local runoff from the C-44 Basin, then return the stored water to the C-44 when there is a water supply demand. The reservoir will be designed for flood flow attenuation to the estuary; water supply benefits including environmental water supply deliveries to the estuary; and water quality benefits to control salinity and reduce loading of nutrients, pesticides, and other pollutants contained in runoff presently discharged to the estuary.

7b - C-23 and C-24 Storage Reservoirs (UU - Part 1)

This separable element includes above ground reservoirs with a total storage capacity of approximately 115,200 acre-feet located in the C-23 and C-24 Basins in Martin and St. Lucie Counties. The initial design of the reservoirs assumed 14,400 acres with water levels fluctuating up to 8 feet above grade. The final location, size, depth and configuration of these facilities will be determined through more detailed analysis to be completed as a part of the IRL Feasibility Study. It is noted that experience from the Upper

St. Johns Project reveals that greater variability of water levels are more desirable for the ecology and water quality.

The purpose of this separable element is to capture local runoff from the C-23 and C-24 Basins for flood flow attenuation to the St. Lucie River Estuary. It is assumed that these facilities can be designed to provide significant water quality improvement benefits to the IRL and St. Lucie River Estuary in terms of reduced loading of nutrients, pesticides, and suspended materials in stormwater runoff which is presently conveyed to those waterbodies. This water will then be used to provide both water supply and environmental water supply benefits.

7c - C-25 and North Fork and South Fork Storage Reservoirs (UU - Part 2)

This separable element includes above ground reservoirs with a total storage capacity of approximately 234,000 acre-feet located in the C-25 and the North Fork and South Fork Basins in St. Lucie and Martin Counties. The initial design of the reservoirs assumed 24,600 acres with water levels fluctuating up to 8 feet above grade and 9,350 acres with water levels fluctuating up to 4 feet above grade. The final location, size, depth and configuration of these facilities will be determined through more detailed analysis to be completed as a part of the IRL Feasibility Study. It is noted that experience from the Upper St. Johns Project reveals that greater variability of water levels are more desirable for the ecology and water quality.

The purpose of this separable element is to capture local runoff from the C-25 and the North Fork and South Fork Basins for flood flow attenuation to the St. Lucie River Estuary. It is assumed that these facilities can be designed to provide significant water quality improvement benefits to the IRL and St. Lucie River Estuary in terms of reduced loading of nutrients, pesticides, and suspended materials in stormwater runoff which is presently conveyed to those waterbodies. This water will then be used to provide both water supply and environmental water supply benefits.

Chapter 6
EVERGLADES AGRICULTURAL AREA

PHYSICAL CONDITIONS - EVERGLADES AGRICULTURAL AREA (EAA)

The lands located immediately south and southeast of the Lake Okeechobee in the South Florida Water Management District (SFWMD) are known as the Everglades Agricultural Area (EAA). This area of about 700,000 acres consists of rich, fertile agricultural land. A large portion of the EAA is devoted to the production of sugarcane. The average ground elevation is about 12 feet. The occurrence of surface water in the area is now a direct result of the construction of the numerous conveyance and drainage canals. The primary canals consist of the Miami, the North New River, the Hillsboro, and the West Palm Beach canals, which traverse the area north to south, and the Bolles and Cross canals, which extend east to west. Water levels and flows are stringently manipulated in the canals to achieve optimum crop growth. Major surface impoundments in the area are nonexistent.

EXISTING CONDITIONS - EVERGLADES AGRICULTURAL AREA (EAA) WATER MANAGEMENT

The existing drainage/irrigation system within the EAA is a complicated network of canals, levees, control structures and pumps. The original six major canals, (West Palm Beach, Hillsboro, Miami, North New River, Cross and Bolles canals), built in the 1920s, still serve to drain the EAA although each canal underwent major improvements during the 1960s. Historically the EAA has depended upon the flood storage capacity of Lake Okeechobee to the north and the Everglades Water Conservation Areas (WCAs) to the south as a means of removing excess drainage water from the EAA. Prior to adoption of the IAP in 1979, the northern one-third of the EAA was routinely backpumped directly into Lake Okeechobee through the S-2, S-3, and S-4 pump stations located on the south shore of the lake. The eastern and southern two-thirds of the EAA drained water south to the WCAs via pump stations S-5A, S-6, S-7, and S-8.

Under the current IAP, drainage frrm the S-2 and S-3 basins is now also routed south to the WCAs. Approximately 82 percent of the EAA land area (i.e., S-2, S-3, S-5A, S-6, S-7, and S-8 basins) now pump excess drainage waters into the three WCAs via pump stations S-5A, S-6, S-7, and S-8. Nine much smaller Chapter 298 Drainage Districts also currently discharge surface water runoff into Lake Okeechobee. As a result, the EAA depends on the flood storage capacity of the WCAs, and to a lesser extent, on Lake Okeechobee, as a means to remove water from the basin.

The growers remove runoff water from their lands by pumping to the six Central and Southern Florida Flood Control Project (C&SF Project) canals serving the EAA. Growers in general are allowed a maximum removal rate that is determined by a runoff

formula and is almost always in excess of the basinwide design rate of three-quarters of an inch of runoff per day (Cooper, 1989). This amount was based on the following three considerations:

1. Not all land in the basin would be in agricultural production at one time.
2. Some of the land would be planted to water tolerant crops.
3. The canals in the basin have some storage capacity.

Although the capacity of the canal system is not large enough to handle all the water discharged from the EAA at one time, it was assumed that not all of the growers' pump stations would be pumping or pumping to capacity at any given time (Cooper, 1989).

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - EVERGLADES AGRICULTURAL AREA (EAA)

Recent monitoring results indicate that phosphorus loads in EAA runoff have declined approximately 51 percent (three year average, SFWMD, 1997b). The current average concentration of total phosphorus contained in EAA runoff is approximately 100 parts per billion (Havens, 1997). Construction of the Everglades Construction Project (ECP) involves converting approximately 44,000 acres of existing agricultural land. The construction project is explained in more detail in the below section.

Everglades Forever Act

The Everglades Forever Act's principal water quality treatment strategy for improving water quality in the Everglades Protection Area centers around five requirements: the ECP, EAA best management practice (BMP) programs, Everglades research and monitoring program, evaluation of water quality standards and long-term compliance permits.

The ECP consists of six large wetlands treatment facilities deemed stormwater treatment areas (STAs) containing approximately 44,000 acres of land previously used for agricultural purposes. These areas are designed to treat EAA runoff prior to discharge into the Everglades Protection Areas.

The ECP is designed to treat EAA runoff to meet an interim phosphorus concentration target of 50 parts per billion in discharges to the Everglades Protection Area (Burns and McDonnell, 1994). STAs 1 East and 1 West will discharge into the L-7 and L-40 borrow canals in the Loxahatchee National Wildlife Refuge (WCA-1). STA 2 will discharge to WCA-2A via the L-6 Borrow Canal. STA 3/4 will discharge to WCA-3A via the L-5 Borrow Canal. Stormwater Treat Area 5 will discharge to Rotenberger and Holey Land Wildlife Management Areas and WCA-3A along the L-4 Borrow Canal. STA 6 discharges to WCA-3A through the L-4 Borrow Canal. STA 6 Section 2 will discharge to

Rotenberger Wildlife Management Area. The future base condition assumes all of the treatment areas are completed and operational with the exception of STA 6 Section 2. STA 6 Section 2 was not included in hydrologic regional modeling since the conceptual design for the STA did not include this element (Burns and McDonnell, 1994).

Another component of the ECP targeted for completion in 2003 is the diversion of runoff from five special districts (four chapter 298 districts and the 715 Farms Area established under Florida Statutes). These special districts are located adjacent to Lake Okeechobee north of the EAA. Currently, the districts discharge directly to Lake Okeechobee. According to the Everglades Forever Act, approximately 80 percent of the historic flow volumes and total phosphorus loads are to be diverted away from the lake. The future base condition assumes that the diversion of flows and loads has been completed.

According to the Everglades Forever Act, based upon research, field-tests and expert review, the EAA BMPs are determined to be the most effective and practicable on-farm means of improving water quality to a level that balances water quality improvements and agricultural productivity. The act establishes monitoring programs, permit requirements, research, field-testing and evaluation programs designed to improve water quality prior to discharge into conveyance canals in the EAA. The act provides a tax incentive for phosphorus concentration reductions of 25 percent or more. As a consequence, the future base condition assumes a 25 percent phosphorus concentration reduction from BMPs.

In addition to the ECP and BMPs, the Everglades Forever Act directs that an Everglades Research and Modeling program shall seek means of optimizing the design and operation of the STAs. This program shall include research to reduce outflow concentrations and identify other treatment and management methods and regulatory programs that are superior to STAs in achieving the intent and purposes of the Everglades Forever Act. The research and monitoring program is also directed toward development of a permanent (threshold) phosphorus criterion in the Everglades Protection Area by the Florida Department of Environmental Protection (FDEP) and evaluation of existing state water quality standards applicable to the Everglades area. The criterion is to be adopted by December 31, 2003 or a default criterion of 10 parts per billion total phosphorus will be established. Currently, research efforts have not drawn any conclusions that affect treatment area designs, planned operations, or the threshold phosphorus criterion. Research to determine superior or supplemental technologies and the threshold phosphorus standard is ongoing.

The Everglades Forever Act does specify that compliance with water quality standards shall be based upon a long-term geometric mean of concentration levels to be measured at sampling stations reasonably representative of receiving waters in the Everglades Protection Area. Discharges to the Everglades Protection Area from outside the EAA (non-ECP structures) also require evaluation to determine appropriate strategies. The Everglades Forever Act requires the SFWMD and the FDEP to take such action as may be necessary so that water meets state water quality standards in all parts of the Everglades Protection Area.

The Everglades Forever Act further directs that long-term compliance permit requirements shall be modified to achieve compliance with the phosphorus criterion cited in the above paragraph. If the FDEP has not adopted this criterion by rule prior to December 31, 2003, then the phosphorus criterion shall be 10 parts per billion in the Everglades Protection Area. This default criterion or the criterion adopted by the Department (Phase II) is to be imposed by 2006. The Everglades Forever Act specifies that as of December 31, 2006, no permittee's discharges shall cause or contribute to any violation of water quality standards in the Everglades Protection Area. In view of the fact that the Phase II phosphorus criterion has not been established, the future base condition assumes that the default standard of 10 parts per billion has been attained.

Design of the ECP was initiated in 1995 and began construction in 1997. STA 6 Section 1 was completed in October 1997 and operation was initiated in December 1997. Construction is currently underway at STAs 1 West, 2, and 5 with completion scheduled on or before September, November, and July 1999 respectively. Scheduled construction completion for STA 1 East and 3/4 is set for July 1, 2002 and October 1, 2003 respectively.

A demonstration-scale wetlands treatment area project of nearly 3,800 acres has been operating adjacent to WCA-1 (Loxahatchee National Wildlife Preserve) on the same site as future STA 1 West since 1994. STA 1 West will encompass the demonstration project when completed. The Everglades Nutrient Removal Project (ENRP) was designed to reduce phosphorus from an inflow concentration of 190 parts per billion to an outflow concentration of 50 parts per billion. The settling rate constant for the demonstration project was set at 10.2 meters per year. These were the same parameters established for the ECP STA design. Three years of cumulative data from the demonstration project reflects that these criteria have been significantly exceeded. Additionally, on-farm BMPs have averaged 51 percent, considerably higher than the projected 25 percent contained in the future base condition for the EAA.

It is too early to predict what conclusions research and analyses will drive with regard to the above findings. An optimistic scenerio is that the BMPs reduction in phosphorus concentrations will increase STA operations such that concentrations lower than the interim criterion will be achieved. Also, the higher settling rate constant and low phosphorus concentration outflows could significantly improve performance of the STAs and thus reduce Phase II treatment needs. Only time and further operations of the treatment areas will judge whether the long-term findings will be supportive of the optimism suggested by current BMPs and ENRP findings. The current findings certainly should affect the research into what supplemental technologies may be necessary to achieve the Phase II phosphorus criterion.

During the alternative development and evaluation phase of the Restudy, a preliminary study was conducted by Walker (Walker, 1998) to evaluate the performance of the STAs based upon Restudy generated flows from the South Florida Water Management model in the future base condition and the preferred alternative. A phosphorus removal model developed by Walker was used in the study. Modeling results indicated that some of the STAs did not meet the interim phosphorus criteria of the Everglades Forever Act under

either the future base condition or the preferred alternative. A closer examination reveals some of the reasons for the apparent underachievement. First, the periods of records differ. The ECP used a 10-year period of record from 1979 to 1988. The Restudy uses the 3year period from 1965 to 1995. Second, the operational concepts differ. The Restudy uses rain-driven operational procedures whereas the ECP uses the current calendar-based regulation schedule. Third, because STA 6 Section 2 was not modeled in the Restudy, the treatment area was not considered in the phosphorus modeling. Therefore, a treatment area totaling nearly 2,000 acres was not considered and the inflows scheduled for this area were all routed through STA 5. Finally, although the period of record was changed from ten years to 31 years, the fixed parameters of the settling rate of 10.2 meters per year and targeted outflow concentration of 50 parts per billion remained unchanged from the ECP.

These two parameters (settling rate constant and outflow phosphorus concentration target) are two of the three most significant factors in determining the required area of treatment cells. Walker's study did indicate that when the 51 percent BMP phosphorus reduction rate experienced over a three-year period was used in lieu of the 25 percent estimate, all STAs met or bettered the interim phosphorus criterion with the exception of STA 5. STA 5 did not meet the criteria in the modeling outcome due to the third reason cited in the preceding paragraph.

At first blush, the reasons cited above appear to mitigate the Walker findings of STA underachievement. Although only time and continued operation of the treatment areas will provide proof, the findings should, in any case, direct research efforts toward ensuring that Phase II treatment technologies are sufficient to meet the adopted threshold standard. Regardless of the Walker study or the demonstration project findings, the fact remains that the Phase II (threshold) phosphorus standard must be met by 2006. The default criterion of 10 parts per billion is the target assumed in the 2050 future base condition. At that point, the interim standard becomes obsolete. When research efforts determine the optimal method of operation and supplemental technologies needed to meet the Everglades Forever Act permanent (Phase II) phosphorus criterion, both the ECP and treatment elements of the Restudy components must be modified to attain the designated water quality standard.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - EVERGLADES AGRICULTURAL AREA (EAA)

According to the FDEP 1998 303(d) list of use-impaired water bodies, there are approximately 10 canal segments within the EAA not meeting designated uses for Class III waters. For the most part, these include canal segments affected by operation of the primary pump stations and canals discharging water from the EAA to downstream areas (e.g., S-7, and S-8 pump stations; North New River, Hillsboro, and West Palm Beach canals). In addition to excessive nutrient loads, low dissolved oxygen (DO) levels and high levels of mercury (based on fish consumption advisories), coliform bacteria, total suspended solids (TSS), turbidity, and unionized ammonia contributed to use impairment in Class III waters within the EAA. It should be noted that within the EAA, there are many agricultural canals or ditches in agricultural water management systems controlled by

water control structures permitted by the SFWMD. Such water bodies are classified as Class IV waters (agricultural water supply) pursuant to Rule 62-302.600(3)(a), Florida Administrative Code. Generally, the water quality criteria for Class IV waters are less stringent than those for Class III waters. None of the 303(d)-listed segments within the EAA are in Class IV waters.

Water quality conditions within the EAA are expected to improve in 2050 compared to existing conditions. It is important to note that the existing conditions for the EAA demonstrate significant water quality improvements compared with recent past conditions. Recent water quality improvements in the area have occurred as a result of the implementation of the EAA regulatory program (Florida Administrative Code Rule 40E-63) beginning in 1993. The regulatory program requires BMPs and monitoring to achieve a 25 percent reduction in phosphorus loading from the EAA to the Everglades Protection Area. Recent monitoring results indicate that phosphorus loads in area runoff have declined approximately 51 percent (three year average, SFWMD, 1997b). The current average concentration of total phosphorus contained in EAA runoff is approximately 100 parts per billion (Havens, 1997). BMPs are also expected to have resulted in a net reduction of other pollutants contained in agricultural runoff, although the extent of load reduction for other pollutants has not been fully quantified since the implementation of the program; nor is it a specific objective of that program.

LAND USE - EVERGLADES AGRICULTURAL AREA (EAA)

Agriculture

The EAA contains all or parts of Palm Beach and Hendry counties. Most of Hendry County lies within the Big Cypress Region, so it was discussed in that section of the report. More than 600,000 acres are farmed in Palm Beach County (UFBEBR, 1995), and sugarcane was harvested from about half of that acreage in 1996 (FASS, 1996d). Sugarcane receipts accounted for 68 percent of total field crop sales in Florida in 1996 (FASS, 1996c). The EAA is known for its sugarcane production and sugar processing, but Palm Beach County also ranks fifteen among Florida counties for acres of citrus (FASS, 1996b). This region is characterized by midsize farms averaging 690 acres each with high productivity of more than $1,300 per acre (UFBEBR, 1995). More than 18,000 people are employed in agricultural production and services representing a payroll of more than $26 million (UFBEBR, 1995). Total market value of agricultural products in Palm Beach County is almost $900 million, ranking it first among counties in the state of Florida (UFBEBR, 1995) and third among United States counties (FDACS, 1994).

The EAA is highly dependent upon the system of canals running through the region to provide necessary drainage of excess water during the wet season as well as supplemental water supplies for irrigation during the dry season. Approximately two thirds of the land farmed in the EAA is irrigated, totaling more than 580,000 acres (B. Boyd, pers. comm.). The EAA has traditionally relied upon Lake Okeechobee for its water supply, and looked to the WCAs to the south to receive their excess drainage.

Continued agricultural production in the EAA has become increasingly controversial. Some of the factors that may affect EAA agriculture include water quality concerns, soil subsidence, and encroachment of urbanization. The water quality concerns, particularly phosphorus loading, are being addressed through implementation of BMPs, construction of STAs, the growing use of organic farming practices, and rice cultivation in rotation with sugarcane production.

Palm Beach County is included in this region. A portion of Hendry County also lies in the EAA. Palm Beach County is not entirely within the EAA, but it is assumed that the majority of agricultural production is within the EAA because the remaining portion of the county is primarily urbanized.

Although sugarcane cultivation in the EAA has come under some sharp criticism in recent years, sugarcane is recognized as the most appropriate crop for this region. Sugarcane requires less phosphorus fertilizer than other crops grown in the EAA (Sanchez, 1990), and sugarcane has been found to remove 1.79 times more phosphorus than was applied as fertilizer (Coale et al., 1993). Florida sugarcane only requires small amounts of pesticides due to disease resistant and tolerant cultivars, and cultivation instead of herbicides for weed control. Sugarcane also tolerates greater variability in water table levels, allowing for more flexible water management strategies (Glaz, 1995).

Soil subsidence has become a potential threat to long-term crop production in the EAA. The average historic rate of subsidence of 1 inch per year has slowed to 0.56 inches per year since 1978 (Shih et al., 1997). They attributed the lower rate to several factors including higher water tables and an increased proportion of land planted to sugarcane. Surveys conducted by Shih et al. (1997) in 1997 found an average of 1.62 feet to 4.36 feet of soil remaining over 11 transects. Prevention of continued soil subsidence will depend on maintaining high ground water levels to prevent further oxidation of the soil profile. This, in turn, will require development of more water-tolerant sugarcane varieties and/or increased rice cultivation. This research is currently underway and showing promising results (Glaz, 1997). A strong agricultural economy in the EAA based on profitable crop production is the best defense against conversion of agricultural land to urban land.

Rotenberger and Holey Land Wildlife Management Areas

The Holey Land Tract (35,026 acres) is managed by the Florida Fish and Wildlife Conservation Commission (FWC) as a state wildlife management area. The SFWMD as been managing the hydroperiod since completion of a perimeter levee and pump station in 1990. The Rotenberger Tract (23,970 acres) and Brown’s Farm Tract (4,460 acres) are also managed by the FWC as state wildlife management areas. Lake Harbor Waterfowl Management Area is operated by FWC for management of waterfowl. The land is under rice production for both harvest and wildlife habitat.

Urban

The remaining five percent of the EAA includes the communities of Pahokee, Belle Glade, South Bay, and Clewiston, along with several sugar mills, roads, canals, and water control features.

C-139 Basin

Land use within the C-139 Basin of eastern Hendry County is predominantly agricultural. The land use in the basin is approximately 62 percent agricultural, 4 percent urban, and 34 percent native land cover. This rural area is primarily pasture land for cattle grazing, with increasing amounts of land being converted to citrus groves. Agricultural land uses include vegetable farms, citrus groves, improved pasture, and unimproved pasture (Mock Roos, 1993).

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

8 - Everglades Agricultural Storage Reservoir Project (G - Part 1)

This project is the first part of the of the Everglades Agricultural Storage Reservoir component. It includes two aboveground reservoirs with a total storage capacity of approximately 240,000 acre-feet located on land associated with the Talisman Land purchase in the EAA. Conveyance capacity increases for the Miami, North New River, Bolles, and Cross Canals are also included in the design of this project. The initial design for the reservoir(s) assumed 40,000 acres, divided into two, equally sized compartments with water levels fluctuating up to 6 feet above grade in each compartment. However, actual design and construction of this first phase may result in multiple reservoirs by maximizing the use of the land acquired through the Farm Bill land acquisition agreements which encompasses up to 50,000 acres.

This project is located in the EAA in western Palm Beach County on lands purchased with United States Department of Interior (USDOI) Farm Bill funds, with SFWMD funds, and on lands gained through a series of exchanges for lands being purchased with these funds. The area presently consists of land that is mostly under sugarcane cultivation. Implementation of this project will be consistent with the Farm Bill land acquisition agreements. This project will improve timing of environmental deliveries to the WCAs by reducing damaging flood releases from the EAA to the WCAs, reducing Lake Okeechobee regulatory releases to estuaries, meeting supplemental agricultural irrigation demands, and increasing flood protection within the EAA.

Compartment 1 of the reservoir would be used to meet EAA irrigation demands. The source of water is excess EAA runoff. Overflows to Compartment 2 could occur when Compartment 1 reaches capacity and Lake Okeechobee regulatory discharges are not occurring or impending. Compartment 2 would be used to meet environmental

demands as a priority, but could supply a portion of EAA irrigation demands if environmental demands equal zero. Flows will be delivered to the WCAs through STAs 3 and 4. The sources of water are overflow from Compartment 1 and Lake Okeechobee regulatory releases. Compartment 2 will be operated as a dry storage reservoir and discharges made down to 18 inches below ground level.

No land acquisition requirements and associated expenses are anticipated during the FY2002 - FY2006 period. Therefore, no funds are listed in **Figure 1** in Chapter 1 for the EAA.

Chapter 7
BIG CYPRESS REGION

PHYSICAL CONDITIONS - BIG CYPRESS REGION

Big Cypress Swamp spans approximately 1,205 square miles (771,000 acres) from southwest of Lake Okeechobee to the Ten Thousand Islands in the Gulf of Mexico. The 570,000-acre Big Cypress National Preserve (BCNP) was established by Public Law 93-440 in 1974 to protect natural and recreational values of the Big Cypress Watershed and to allow for continued traditional uses such as hunting, fishing, and oil and gas production. It was also established to provide an ecological buffer zone and protect Everglades National Park's water supply. In 1988, Congress passed the Big Cypress National Preserve Addition Act which added 146,000 acres to the preserve.

EXISTING CONDITIONS - BIG CYPRESS REGION WATER MANAGEMENT

The Big Cypress Swamp is a recognized physiographic province in southwestern Florida. It is a source of recharge for the shallow aquifers of South Florida and is important to the integrity of the water resources in the western part of Everglades National Park. The hydrological features of the swamp were recognized by Congress when it established BCNP. The water regimen of the area largely determines the patterns in which temperate and tropical vegetative communities and their related wildlife species occur. During the wet season (summer and fall) when heavy rains lead to widespread surface inundation, the almost imperceptible slope of the land creates an overland sheetflow. During the dry season (winter and spring) natural surface water flows are confined to the lower elevations of strands, swamps, and sloughs. The BCNP has been mapped by the USFWS as part of the national wetlands inventory. The majority of BCNP lands are classified as wetlands; exceptions are scattered hardwood hammocks, some pinelands, and artificially filled areas. The Big Cypress Region is essentially a rain-driven hydrologic unit, and for the most part it is not dependent on adjacent land for water flow. Only three small areas (approximately five percent of the BCNP) receive flows from external drainages. These areas include less than 5 square miles in the Okaloacoochee Slough, about 30 square miles in the Mullet Slough component of the Everglades drainage, and approximately 40 square miles in the southeastern corner of the BCNP along the western boundary of the Shark River Slough.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - CRITICAL RESTORATION PROJECTS

Western Tamiami Trail Culverts

The project is located on the Tamiami Trail (US 41) in Collier County between State Road (SR) 92 and 50 Mile Bend (a distance of approximately 43 miles). In 1928, the Tamiami Trail was completed between Miami and Naples. To obtain fill material for the roadbed, a borrow canal was excavated on the northern side of the road alignment. The effect of the Tamiami Trail and adjacent borrow canal has been to intercept existing north-south flowways to the BCNP and channels flows through a few bridges/culverts. The purpose of this project is to increase the number of north-south floodways by adding culverts in locations that will restore natural hydropatterns. The installation of approximately 80 culverts under Tamiami Trail and Loop Road will improve sheetflow of surface water within Ten Thousand Islands National Wildlife Refuge, BCNP and Everglades National Park. The total project cost of the restoration elements is estimated at $7.57 million. A highway resurfacing betterment is estimated at $8.03 million.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - BIG CYPRESS BASIN

The South Florida Water Management District (SFWMD) has identified the S-190 Structure (a gated culvert at the confluence of the North and West feeder canals) as a water control structure discharging into the Everglades Protection Area that requires an assessment of pollution loads and the development of a water quality improvement strategy in accordance with the non-Everglades Construction Project (ECP) structures requirement of the Everglades Forever Act. SFWMD water quality data (SFWMD, 1998a) indicate that agricultural areas upstream of the Seminole Reservation contribute significant nutrient loads (particularly phosphorus) into the canal system that drains into the North and West feeder canals and ultimately across the northeast corner of BCNP. Water quality improvements required under the Everglades Forever Act are to be completed by December 31, 2006, to assure that all water quality standards are met in the Everglades Protection Area.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - BIG CYPRESS BASIN

The Big Cypress Basin (the watershed of BCNP) includes agricultural areas west of the Everglades Agricultural Area (EAA), the Seminole Tribe's Big Cypress Reservation, most of the Miccosukee Tribe of Indians' reservation lands, and developed areas of the west coast including Naples and Marco Island. Five water body segments within the Big Cypress Basin were included on the Florida Department of Environmental Protection (FDEP) 1998 303(d) list. Pollutants/constituents of concern include excessive nutrients, coliform bacteria, biochemical oxygen demand (BOD), mercury (based on fish

consumption advisories), and low levels of dissolved oxygen (DO). It should be noted that none of the 303(d) list sites are within the BCNP. However, the L-28 Interceptor Canal, on the east side of the Big Cypress Basin was listed as use-impaired due to elevated nutrient levels and low levels of DO. It should be further noted that due to the scarcity of ambient monitoring sites in coastal waters of the basin, actual water quality problems are likely to be more severe in coastal waters than as described in the FDEP 1996 305(b) Report due to development pressure and point and nonpoint source pollution loading in developing areas.

Water quality in interior areas of the Big Cypress Basin is not expected to be significantly changed in 2050 compared to existing conditions. However, the rapidly expanding extent of agricultural (citrus) development in the north-central area of the region (Immokalee, southwestern Hendry County) could create an increase in nonpoint source pollution associated with agricultural activities in Mullet Slough and East Hinson Marsh. Water quality in coastal areas is expected to decline consistent with projected population growth.

Excessive drainage and the introduction of water of poor quality into BCNP via the existing canal system constitutes the most significant existing and future water quality problem for BCNP. It should be noted that the canals contributing pollutants into BCNP are not part of the C&SF Project. Existing pollution loads entering the BCNP from northwestern areas of the watershed (Big Cypress Seminole Indian Reservation, C-139 Basin and C-139 Annex agricultural areas) are expected to be reduced in 2050 through the implementation of planned and ongoing water quality improvement projects.

LAND USE - BIG CYPRESS REGION

Land use is organized into major public and private lands and their principal uses, including preservation, recreation, urban, agriculture and water supply.

Big Cypress National Preserve (BCNP)

Roadways in South Florida often obtain necessary roadfill from excavation of a parallel canal, resulting in both an elevated obstruction to natural drainage patterns and rerouting of flow in open canals. Such drainage alterations in the BCNP include the Tamiami Trail (U.S. 41), Interstate 75 (Alligator Alley), County Route 839 (Turner River Road), County Route 841 (Birdon Road), County Route 94 (Loop Road) and numerous smaller roads. State Route 29, a north-south road, parallels the western boundary just outside of the BCNP, although its borrow canal is just within the boundary of the BCNP. Extending northward from the Tamiami Trail along the eastern boundary of the BCNP, the L-28 Levee forms the boundary between the Everglades and Big Cypress drainage. Although the levee is located immediately outside of the BCNP boundary, it is significant to the hydrology of the BCNP. The L-28 Interceptor Canal cuts through the extreme northeastern corner of the BCNP. This canal rapidly drains the agriculturally active lands north of the BCNP.

Oil and gas are currently produced from two active fields in the BCNP. A portion of the Bear Island field lies within the Okaloacoochee Slough in the northwestern corner of the BCNP. The Raccoon Point field is located in the northeastern corner of the original BCNP and north of the Jetport site.

The Miami-Dade-Collier Transition and Training Airport, popularly known as the Jetport, occupies a 32 square mile site just north of the Tamiami Trail and adjacent to the eastern boundary of the BCNP. Although originally intended as an international airport, it is currently used only for limited training activities. Construction required 3 million cubic yards of fill excavated from 7 pits, ranging from 30 to 40 feet deep and covering 65 acres of surface area just west and south of the Jetport runways. Since all structures must be elevated above the seasonal high water levels, fill material must be excavated from borrow pits. Numerous such pits exist within the BCNP, ranging in size and depth, depending upon the extent of the development.

Off-road vehicle (ORV) usage in the BCNP is regulated by the National Park Service and is permitted by the enabling legislation to the extent that it does not significantly harm the environment. About two-thirds of the original preserve is currently open for ORV use. Permits are required, a maximum of 2,500 per year have been established, and areas open to use are designated. The Bear Island Unit, located in the northwestern corner of the BCNP, is restricted to designated trails. Other areas are open to either full or limited use, and two are closed to all ORV use. Airboat and swamp buggy use is mostly during October through March. There has been a general trend toward an increased number of permits annually since 1987.

Some 38,700 acres, totaling six percent of the BCNP's original boundary, are nonfederal lands. These nonfederal lands consist of 12,236 acres of School Board lands consisting of one section in each township set aside for schools, 23,488 acres of Jetport Authority lands, 1,514 acres of county roads, and 1,271 acres of private lands. Nonfederal lands within the Additions have not yet been completely defined.

Agriculture within the original boundary of the BCNP is minimal. Farming is known to be more extensive within the Additions, but until the lands are formally transferred to the federal government, these agriculturally-impacted areas will not be completely defined.

Five active "life" leases, cover grazing rights on approximately 29,000 acres in the northwestern corner of the original preserve. All leases are located north of Alligator Alley. The leases can only be renewed by the permittee or spouse and are not transferable. These are gradually being phased out as lessees curtail operations or leases are relinquished.

Public Law 93-440 provides that members of the Miccosukee Tribe of Indians of Florida and members of the Seminole Tribe of Florida shall be permitted, subject to reasonable regulations established by the Secretary, to continue their usual and customary use and occupancy of federal or federally acquired lands and waters within the BCNP,

including hunting, fishing, trapping on a subsistence basis and traditional tribal ceremonies.

Urban Areas

Naples, Marco Island, and Everglades City comprise the three largest urban areas within the Big Cypress Region. All three cities are on the west coast, and Naples is among the fastest growing urban areas in the United States. It has developed into a significant retirement destination with extensive residential and business center construction. Water supply demands to meet this fast growing and developing urban area are rapidly increasing.

Fakahatchee Strand State Preserve

The Fakahatchee Strand, located just west of the BCNP, is included in the area designated by the state of Florida as an Area of Critical State Concern. It is the recipient of the flow of the Okaloacoochee Slough which cuts across the extreme northwestern corner of the BCNP and crosses under State Route 29 into the strand.

Southern Golden Gate Estates

West of the Fakahatchee Strand State Preserve and south of Interstate 75 is the Southern Golden Gate Estates. The area was planned as a large residential subdivision and construction began in the 1960's. The building of roads and several drainage canals in this 94 square mile area has affected the areas environmental quality, by over-draining the watershed, sending harmful freshwater discharges to the estuaries, increasing frequency of forest fires, and reducing aquifer storage (SFWMD, 1996).

Water Conservation Areas (WCAs)

The BCNP is bounded on the east by WCA-3A which, is managed by the SFWMD. Water is impounded in the Conservation Area and released to Everglades National Park and BCNP on predetermined schedules. The L-28 Levee forms the boundary between WCA-3A and the BCNP.

Everglades National Park

The southern and portions of the eastern boundary of the BCNP abut Everglades National Park. The BCNP's southern boundary forms a "stair-step" pattern that distinguishes the wetland environment of the BCNP and the estuarine environment of the Everglades National Park. The Stair-Step area receives flows from the BCNP enroute to the estuarine environment of the Everglades National Park.

American Indian Reservations

Two American Indian reservations abut the BCNP. The Seminole Tribe is along the eastern part of the BCNP's northern boundary, and the Miccosukee Tribe is along the eastern boundary of the BCNP.

Agriculture

A persistent southward progression of agricultural development presents an external threat to the water quality and quantity of the Okaloacoochee Slough and Mullet Slough drainages. Expanding agricultural development is now located along the BCNP's northern boundary.

Hendry and Collier counties are included in this region. More than 800,000 acres are farmed in the Big Cypress Region, and almost half of that area is pasture land. The region is characterized by moderate to large farms producing more than $600 per acre in market value (UFBEBR, 1995). Hendry County ranks third in the state of Florida for cattle production (FASS, 1996a). Approximately 70,000 acres of sugar were harvested in 1996 (FASS, 1996d). Hendry County ranks third in the state for acres of citrus with over 100,000 acres, while Collier County is ninth with over 36,000 acres (FASS, 1996b). Citrus production in the Big Cypress Region is currently increasing. The Big Cypress Seminole Indian Reservation is located in this region along the northern boundary of the BCNP. The reservation includes some citrus groves and row crops as well as pasture land.

More than 17,000 people are employed in agricultural production and services, and the payroll totals approximately $16 million. Agricultural products in this region have a total market value of more than $525 million. Hendry and Collier counties rank third and fourth in Florida for market value of agricultural products (UFBEBR, 1995).

Chapter 8
WATER CONSERVATION AREAS AND EVERGLADES REGION

PHYSICAL CONDITIONS - WATER CONSERVATION AREAS (WCAS) AND EVERGLADES REGIONS

The Water Conservation Areas (WCAs) are an integral component of the Everglades and freshwater supplies for South Florida. The WCAs, located south and east of the Everglades Agricultural Area (EAA), comprise an area of about 1,350 square miles, including 1,337 square miles of the original Everglades, which averaged some 40 miles in width and extended approximately 100 miles southward from Lake Okeechobee to the sea.

The WCAs provide a detention reservoir for excess water from the agricultural area and parts of the Lower East Coast Region, and for flood discharge from Lake Okeechobee. The WCAs also provide levees needed to prevent Everglades floodwaters from inundating the Lower East Coast, while providing water supply for Lower East Coast agricultural lands and Everglades National Park; improving water supply for east coast communities by recharging the Biscayne Aquifer (the sole source of drinking water for southern Palm Beach, Broward, Miami-Dade, and Monroe counties); retarding salt water intrusion in coastal wellfields; and benefiting fish and wildlife in the Everglades.

WCA-1 is designated as the Arthur R. Marshall Loxahatchee National Wildlife Refuge (NWR), managed by the United States Fish and Wildlife Service (USFWS). WCA-2 and WCA-3 are public hunting and fishing areas comprising the Everglades Wildlife Management Area maintained by the Florida Game and Freshwater Fish Commission (FGFWFC). The Seminole and Miccosukee Tribes each have reserved rights within WCA-3.

Water Conservation Area 1 (WCA-1)

WCA-1 (Loxahatchee NWR) is about 21 miles long from north to south and comprises an area of 221 square miles. The West Palm Beach Canal lies at the extreme northern boundary, and on the south the Hillsboro Canal separates WCA-1 from WCA-2. Ground elevations slope about 5 feet in 10 miles, both to the north and to the south from the west center of the area, varying from over 16 feet in the northwest to less than 12 feet in the south. The area, which is enclosed by about 58 miles of levee (approximately 13 miles of which are common to WCA-2), provides storage for excess rainfall, excess runoff from agricultural drainage areas of the West Palm Beach Canal (230 square miles) and the Hillsboro Canal (146 square miles), and excess water from Lake Okeechobee. Inflow comes from rainfall and runoff from the EAA through canals at the northern end. Release of water for dry-season use is controlled by structures in the West Palm Beach Canal, the Hillsboro Canal, and in the north-south levee which forms the eastern boundary of the

area. When stages exceed the regulation schedule, excess water in WCA-1 is discharged to WCA-2.

Water Conservation Area 2 (WCA-2)

WCA-2 is comprised of two areas, 2A and 2B, measures about 25 miles from north to south, and covers an area of 210 square miles. It is separated from the other WCAs by the Hillsboro Canal on the north and the North New River Canal on the south. Ground elevations slope southward about 2 to 3 feet in 10 miles, ranging from over 13 feet NGVD (National Geodetic Vertical Datum) in the northwest to less than 7 feet NGVD in the south. The area is enclosed by about 61 miles of levee, of which approximately 13 miles are common to WCA-1 and 15 miles to WCA-3. An interior levee across the southern portion of the area reduces water losses due to seepage into an extremely pervious aquifer at the southern end of the pool and prevents overtopping of the southern exterior levee by hurricane waves.

The upper pool, WCA-2A, provides a 173 square mile reservoir for storage of excess water from WCA-1 and a 125 square mile agricultural drainage area of the North New River Canal. Storage in WCA-2A provides water supply to the east coast urban areas of Broward County. Water enters the area from WCA-1 and the Hillsboro Canal on the northeast side, and from the North New River Canal on the northwest side. Water in excess of that required for efficient operation of WCA-2A is discharged to WCA-3 via structures into C-14, the North New River Canal, and WCA-2B.

WCA-2B has ground elevations ranging from 9.5 feet NGVD in the northern portions down to 7.0 feet NGVD in the southern portions of the area. The area experiences a high seepage rate, which does not allow for long-term storage of water, and as a result, water is not normally released from the area.

Water Conservation Area 3 (WCA-3)

WCA-3 is also divided into two parts, 3A and 3B. It is about 40 miles long from north to south and comprises about 915 square miles, making it the largest of the conservation areas. Ground elevations, which slope southeasterly 1 to 3 feet in 10 miles, range from over 13 feet NGVD in the northwest to 6 feet NGVD in the southeast. The Miami Canal traverses the area from northwest to southeast, and the North New River Canal separates it from WCA-2. The area is enclosed by about 111 miles of levee, of which 15 miles are common to WCA-2. An interior levee system across the southeastern corner of the area reduces seepage into an extremely pervious aquifer.

The upper pool, WCA-3A, provides a 752 square mile area for storage of excess water from WCA-2A; rainfall excess from approximately 750 square miles in Collier and Hendry counties and from 71 square miles of the former Davie agricultural area lying east of Pumping Station S-9 in Broward County; and excess water from a 208 square mile agricultural drainage area of the Miami Canal and other adjacent areas to the north. Water enters WCA-3A from various sources on the northern and eastern sides. The storage is

used to meet the principal water supply needs of adjacent areas, including urban water supply and salinity control requirements for Miami-Dade and Monroe County, irrigation requirements, and water supply for Everglades National Park.

EXISTING CONDITIONS - WATER CONSERVATION AREAS (WCAS) WATER MANAGEMENT

WCA-1 is encircled by 56 miles of levees and canals. A network of pump stations, levees and water control structures, controls water levels. WCA-1 is the only conservation area completely encircled by canals. The water management facilities hydrologically are connected with Lake Okeechobee, the EAA, WCA-2, WCA-3, and the Atlantic Ocean. Rainfall represents the major source of water inflow into WCA-1, accounting for about 54 percent of the refuge's water budget. Pump Station S-5A, located at the northern tip of the refuge near 20-Mile Bend, moves water into the refuge from the West Palm Beach Canal, accounting for approximately 30 percent of the inflow water. Pump Station S-6, located on the refuge's western border, pumps water from the Hillsboro Canal into the southwest portion of the refuge, accounting for about 15 percent of WCA-1 inflow water. Approximately 45 percent of the WCA-1 water inflow originates as drainage from agricultural land located north and west of WCA-1. Two small pumps operated by the Acme Improvement District are located in the L-40 Levee on the northeastern boundary of the refuge. These pumps drain primarily residential/urban lands (Wellington) and can move water in and out of the refuge. Acme represents only a minor fraction (<1 percent) of the refuge's water budget. Four water control structures (S-10A, S-10C, S-10D, and S-10E) exist along WCA-1 on the southern levee of L-39 (Hillsboro Canal). The S-10 structures allow water to flow southward out of the Hillsboro Canal and WCA-1 into WCA-2A if so desired. The Hillsboro Canal (L-39), located in the extreme southeast corner of the refuge, drains WCA-1 to the east through S-39, which provides water supply to urban areas and discharges drainage waters to tide water. To the north, the S-5A Structure can be used to move water north out of the refuge into the L-8 Canal. There are four other small privately operated structures in the L-40 levees; one of these is operated by the USFWS. These structures constitute less than one percent of the refuge's annual water budget. Water management operations for WCA-1 are governed by a water regulation schedule adopted in 1994.

Major developments in the WCAs have been the construction of canals, levees, water control structures and roads. WCAs-2 and 3 are almost completely enclosed by a levee and canal system that is approximately 150 miles in length. The only portion of the area not completely enclosed by the levee system is WCA-3A where a 7 mile section of the western border remains hydrologically connected to the Big Cypress National Preserve (BCNP). Four canals and their associated levees pass through the WCAs: the Miami Canal, L-35B Canal, L-67A Canal, and L-67C Canal.

Many water control structures have been constructed to move water throughout the WCAs. Facilities designed to provide flow into the area include the S-6, S-7, S-8, S-9, and S-140 pump stations, and a series of gated spillways referred to collectively as the S-10 structures. Water is moved from WCA-2A to WCA-3A via the S-11 structures and

through WCA-3A via the Miami Canal and a series of bridged openings under Alligator Alley (I-75). Water is released from WCA-3A through the S-12 and S-333 structures and the Pompano and North New River canals. The canals, levees, and water control structures were constructed and are currently operated by the United States Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD). The WCAs were constructed primarily to provide flood protection to adjacent agricultural and urban areas, and to serve as a source of fresh water for the heavily populated Lower East Coast. Secondary considerations were the need to manage the areas to benefit fish and wildlife, and to provide public recreation.

Water regulation schedules represent water level targets that govern the operations to store and release water from the WCAs. The water regulation schedule for WCA-2A was originally set too high to support Everglades habitat, and has been the subject of extensive research and experimentation. The original 1961 schedule called for water levels to fluctuate from 12 to 14.5 feet. The schedule was revised even higher in 1970 to a range of 13 to 14.5 feet with only a 30-day period at the lower end. Observed changes in the ecology of WCA-2A caused scientists in the early 1970s to initiate efforts to lower the water schedule and provide for annual drying of the interior marsh. Extended high water killed significant stands of trees, eroded islands, and caused other undesirable vegetation changes in the area (Dineen, 1972, 1974; Worth, 1988). In 1980, the schedule was revised to an interim plan of 9.5 to 12.5 feet, an extreme drawdown that was in place for eight years. Extensive research during this time led to an interim schedule of 11 to 13 feet, which was adopted in 1989.

The regulation schedule for WCA-3A is perhaps the most complicated and difficult schedule to describe or implement. The schedule ranges from 9.5 to 10.5 feet, but includes a series of five zones to modify discharges to Everglades National Park when water levels are above or below the optimum target. The size of WCA-3A and the number of inflow and discharge points preclude intensive management of water levels in the area. Discharges at the southern end of the area flow directly into Everglades National Park. These discharges were modified three times in the past decade to alleviate problems resulting from too little discharge in the early years, and heavy flood discharges during the dry season, which impacted nesting wading birds and other wildlife during the 1970s and early 1980s. The original schedule was set shortly after Everglades National Park and the SFWMD's predecessor agency was created. In 1970, Congress adopted an Everglades National Park-backed plan to establish a minimum monthly volume of water to be delivered to Everglades National Park. This resulted in significant flood damages from dry-season floodwaters, which were discharged from WCA-3A when the water schedule was exceeded. In 1983, Congress authorized an Experimental Program of Water Deliveries to Everglades National Park, which allowed an experiment with water releases based on rainfall and evaporation over the Everglades. This rainfall-based plan distributes water over a broader area than the original operating schedule whenever possible.

Other problems within WCA-3A, primarily overdrainage in the northern end, are not due to the schedule but instead are caused by the design of water-control facilities. These regulation schedules are open to review and change if the agencies involved find better ways of regulating the water levels.

Currently, Holey Land Wildlife Management Area's water regulation schedule is based upon the initial operating plan agreed to by the SFWMD and the FGFWFC June 28, 1990. This schedule dictates that water stages in Holey Land Wildlife Management Area vary between a low of 11.5 feet MSL on May 16 to a high of 13.5 feet on November 1. When direct rainfall is unable to provide enough water to meet the schedule, water is pumped onto the area from the Miami Canal at the G-200 Pump Station in the northwest corner of the area. Other water enters the area from the G-201 Pump Station, which returns water to Holey Land from the exterior seepage canal. Outflow is through three set of culverts along Holey Land's south boundary. In accordance with the 1990 Operational Agreement, after cattail coverage exceeded 2,000 acres, flashboards were placed in the outflow culverts and were set at 13.5 feet in order to retain water in the area as long as possible to reduce the need for pumping untreated water from the Miami Canal. Detailed topographic data on Holey Land Wildlife Management Area, collected after restoration began, found that average ground elevation was approximately 0.5 feet lower than previously thought and a verbal agreement was made between SFWMD and FGFWFC in July, 1993 to change the operational schedule to one that lies between 113 feet. Additional research conducted by FGFWFC and the SFWMD staffs indicated that high water levels in Holey Land Wildlife Management Area contributed to the explosive growth of cattails in the area after restoration began, and that water levels above 12.5 feet drove deer from the marsh onto surrounding levees. In response to this information, on January 20, 1995, the FGFWFC proposed that the water schedule be again lowered, to 10.5-12.0 feet, a level that has since been used as a guideline by the SFWMD. A similar (10.75-12.0 feet) schedule was proposed by the FGFWFC on June 11, 1997, and discussions are currently underway to finalize an agreement recognizing this proposed level. The water management plan is designed to simulate a natural hydroperiod for the purpose of restoring and preserving natural Everglades habitat.

The Rotenberger Wildlife Management Area is located in the north end of the Everglades ecosystem, in an area that has historically been dominated by nearly monospecific plains of dense sawgrass. Since drainage efforts began in the late 1800s, 74 percent of these sawgrass plains have been lost to agriculture. The Rotenberger Wildlife Management Area represents nearly 18 percent of the remainder of this important component of the Everglades. Because of development and drainage of surrounding areas, the hydropattern in the Rotenberger Wildlife Management Area has shortened, causing a shift away from its historically sawgrass-dominated community. The distribution, timing, and depths (hydropattern) of water in the Rotenberger Wildlife Management Area have been dramatically changed by drainage to the north and west, as well as in several parcels inside the boundaries. This development, along with construction of canals and levees, has blocked the sheetflow of water southward from Lake Okeechobee; a process which will probably not be reversed. The Rotenberger Wildlife Management Area itself is drained by a series of culverts linked to the L-4 Canal. Several sets of culverts drain farmland on existing inholdings while two sets drain abandoned farms on the eastern border into the Miami Canal.

While the current hydropattern in the Rotenberger Wildlife Management Area does mimic the natural rise and fall associated with the wet and dry seasons, it does not receive enough rainfall to reach historic water levels during the wet season and dries much

more quickly than normal due to the culverts mentioned above. The 1983 agreement between the FGFWFC, SFWMD and the Department of Environmental Regulation calls for the restoration of 0-1 feet water levels in the area. As part of the Everglades Construction Project (ECP), these levels have been used as initial goals of hydropattern restoration within the Rotenberger Wildlife Management Area. Achievement of this goal will be a two stage process. First, all drainage culverts will be closed and the effects of this upon the hydropattern will be assessed. This information will be used to devise an operational schedule for the area which will become effective upon completion of STA 5, and installation of the pumps allowing inflow into the Rotenberger Wildlife Management Area.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - NATURAL AREAS

The natural areas of the study area include the Rotenberger and Holey Land Wildlife Management Areas, the Loxahatchee NWR, WCAs 2 and 3, BCNP, and Everglades National Park. The Rotenberger and Holey Land Wildlife Management Areas are adjacent to the EAA and are contained within the same hydrologic basin. The ECP, which is part of the future without plan condition, is designed to achieve hydrologic restoration objectives for the Rotenberger and Holey Land tracts by redirecting EAA runoff through stormwater treatment areas (STAs) into those areas to create preferred hydropatterns.

A fundamental underlying assumption for the Restudy is the full implementation of the state of Florida's Everglades Program contained in the Everglades Forever Act (Florida Statutes (F.S.) 373.4592) by December 31, 2006. Implementation of the Everglades Forever Act includes completion of construction of the STAs as described in the conceptual design for the ECP (Burns and McDonnell, 1994; scheduled to be completed in 2003), setting of a numeric phosphorus criterion for the Everglades Protection Area, by December 31, 2003, and compliance with that criterion by December 31, 2006.

In addition to the ECP and water quality treatment facilities developed as a result of the non-ECP requirements of the Everglades Forever Act, the currently authorized C-111 Project and the Modified Water Deliveries to Everglades National Park Project are assumed to be implemented in 2050.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - WATER CONSERVATION AREAS (WCAS) AND EVERGLADES NATIONAL PARK RAINFALL-BASED RAINFALL WATER DELIVERY PLANS

In the future without plan condition, the rainfall delivery plan, as defined in the LEC Interim Plan is based on antecedent rainfall and natural system hydropatterns for WCA-2A and 3A and Everglades National Park, with quantities to approximate best management practices (BMPs) Replacement water quantities.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - NATURAL AREAS

Approximately 18 water body segments within Loxahatchee NWR (WCA-1), and WCAs 2 and 3 were listed as use-impaired on the Florida Department of Environmental Protection (FDEP) 1998 303(d) list. Pollutants/water quality parameters contributing to use-impaired conditions include: excessive nutrient loads, low dissolved oxygen (DO) levels, high levels of mercury (based on fish consumption advisories), un-ionized ammonia, coliform bacteria, total suspended solids (TSS) and certain trace metals. There are also four water body segments in Everglades National Park on the 303(d) list. Those water body segments include: ENP Shark Slough, ENP L67 Culvert at US 41, Taylor Slough, and the Tamiami Canal. Problem constituents in Everglades National Park waters include low levels of DO, and high levels of nutrients, mercury (based on fish consumption advisories), iron, other trace metals. Many of the water body segments in the WCAs and Everglades National Park may eventually be removed from subsequent 303(d) lists because the Everglades Forever Act includes schedules and strategies for achieving compliance with water quality standards, consistent with the requirements of the Clean Water Act.

Water quality conditions in the Rotenberger and Holey Land Wildlife Management Areas, Loxahatchee NWR, the WCAs and in downstream Everglades National Park are expected to be significantly improved in 2050 compared to current (without the ECP) conditions.

In the southern Everglades, implementation of the C-111 and Modified Water Deliveries Projects may also involve developing water quality treatment features necessary to assure that regulatory requirements are met. Minimally, implementation of the C-111 Project involves acquisition of the Frog Pond agricultural area adjacent to the C-111/L-31W levee/borrow canal system, which will result in a net reduction of pollution loading (nutrients, pesticides) into Everglades National Park via the existing canal system from nonpoint source agricultural runoff.

LAND USE - WATER CONSERVATION AREAS (WCAS)

The WCAs are located in western and southwestern Palm Beach, western Broward and northwestern Miami-Dade counties, Florida. They consist of WCAs 1, 2, and 3 and encompass approximately 878,000 acres. For management purposes, the area has been subdivided into several units: WCA-1, WCA-2A, WCA-2B, WCA-3A, and WCA-3B. The WCAs are bordered on the east by the Sawgrass Expressway, U.S. Highway 27, and Krome Avenue; on the south by U.S. Highway 41, on the west by Levee 28 (L-28) and the Miccosukee Tribe of Indians of Florida Federal Reservation; and to the north by L-4, L-5, and L-6.

The WCAs are located near several state and federal land and water resources. Lake Okeechobee is approximately 25 miles north. State and federal lands that border the WCAs includes Holey Land Wildlife Management Area, Rotenberger Wildlife Management Area, Miccosukee Tribe of Indians of Florida Federal Indian Reservation, Big Cypress Indian Reservation (Seminoles), BCNP, and Everglades National Park. The Big Cypress Area of Critical State Concern is adjacent the southwest boundary of WCA-3A. As part of the Central and Southern Florida Project (C&SF), land and flowage easements were obtained for the construction of the three WCAs. Construction of the required levees and canals began in 1949 and the WCAs became functional in 1962. The USACE designed, constructed, and currently participates in the management of the WCAs and the water resource.

The SFWMD serves as the local management agent under the direction of the USACE. WCA-1 became the Loxahatchee NWR in 1961, and is managed by the USFWS. WCAs 2 and 3 were designated as the Everglades Wildlife Management Area in 1952, and are operated by the FGFWFC under the terms of a cooperative management agreement with SFWMD (formerly Central and Southern Florida Flood Control District). The agreement became effective on 1 March 1952 with an initial term of 25 years and three automatically successive terms of 15 years each. The SFWMD holds fee title to approximately 27 percent of the WCAs, and has flowage easements over the remainder. The Board of Trustees owns approximately 55 percent, with other public agencies owning approximately 4 percent. Approximately 14 percent of the area is owned by private landowners. The identity of the private landowners and the location of the inholdings are, for the most part, unknown; Palm Beach, Broward and Miami-Dade counties have little or no land records for lands in the Everglades Water Management Area.

In 1982, an agreement between the Board of Trustees of the Internal Improvement Trust Fund, the FGFWFC, the SFWMD and the Miccosukees was prepared to clarify the documentation and respective rights and responsibilities of the state and the Miccosukees in the 189,000 acres of reservation lands within WCA-3.

The SFWMD has used "Save Our Rivers" (SOR) funds since 1982 to purchase land in the Everglades Water Management Area. Section (s.) 373.59, F.S., created the SOR program, and established the Water Management Lands Trust Fund that contains monies designated for the purchase of environmentally sensitive riverine lands. Funds for SOR are provided by a portion of documentary stamp tax on properties purchased in

Florida. SOR legislation calls for the management and maintenance of lands acquired with SOR funds in an "environmentally acceptable manner, and to the extent practicable, in such a way as to restore and protect their natural state and condition." The legislation encourages the use of SOR lands for public outdoor recreational activities compatible with the primary goal of environmental protection and enhancement.

Governor Bob Graham initiated the Save Our Everglades (SOE) program on August 9, 1983. This program was designed to improve environmental conditions in the Everglades system. Two of the seven program initiatives directly affected the management of the Everglades Water Management Area. Initiative 4 required the FGFWFC to manage the Everglades Water Management Area deer herd at a level that could survive moderate flooding conditions. Initiative 5 incorporated hydrological improvements in the conversion of State Road (SR) 84 to Interstate 75 (Alligator Alley). The five remaining program initiatives provided secondary benefits to the Everglades Water Management Area by providing for land acquisition and hydrological improvements that enhanced water quality and delivery to the area.

In 1989, 14,720 acres in WCA-3A were purchased from the Seminole Indian Tribe of Florida with funds from the SFWMD and the CARL Program. This tract was added as an amendment to the Rotenberger Wildlife Management Area lease, which names the FGFWFC as lead managing agency. This amendment has a perpetual flowage easement granted to the SFWMD. The Seminole Tribe has retained nonexclusive use rights in parts of WCA-3A.

The state of Florida passed the "Everglades Forever Act" in 1994. The legislation was written to address environmental concerns related to the quality, quantity, and timing of waters entering the Everglades system. The act provided for the creation of STAs, set water quality standards for water entering the Everglades system, and required the agricultural community to implement BMPs to reduce phosphorous inputs into the Everglades drainage basin.

The three major roadways that affect the WCAs are U.S. Highway 27, which separates WCA-2 from WCA-3, U.S. Highway 41 (Tamiami Trail) which borders WCA-3 to the south, and Interstate 75, which bisects WCA-3. The roadways, in combination with the existing levee and water delivery systems, have altered the natural hydroperiod of the area and disrupted sheetflow throughout the Everglades Water Management Area. In the past, there has been substantial environmental damage to the WCAs due to severe flooding and drought caused by these alterations.

The Holey Land Wildlife Management Area is a tract of Everglades marsh comprising 35,350 acres, located in the southwest corner of Palm Beach County. It is located immediately north of WCA-3, on the east side of the Miami Canal. It is 17 miles south of Lake Okeechobee and approximately 43 miles north of Everglades National Park. A large portion of the property came to the Trustees of the Internal Improvement Trust Fund (Trustees) through statehood as part of the Federal Swamp and Overflowed Lands Act of 1850. Some of the property may have been acquired under the Environmentally Endangered Lands (EEL) acquisition fund in the early 1970s. The remainder of the

property was purchased in order to facilitate restoration of the hydroperiod for the area, possibly through the SOE Program. Lease #2343, dated July 30, 1968 and issued by the Trustees, leased the area to the FGFWFC for fish and wildlife management purposes. Since that time, the FGFWFC has managed the area for public hunting, fishing and recreational use. From 1968 until 1975, the area was apparently included as part of the Everglades Wildlife Management Area. In 1975, it was established by the Game and Fresh Water Fish Commission as the Holey Land Wildlife Management Area. Past uses, prior to 1968, are unknown.

Man-made structures include levees associated with the Miami Canal and the L-5 canal. A series of canals and borrow pits enclose the area's northern and eastern boundaries. Boat ramps are located at the northwest (G-200) and southwest (G-201) pump stations. There are three water gauges (Holey G, Holey 1, Holey 2) within the marsh, with another located in the eastern boundary levee (G-203D). These structures are operated by the SFWMD in accordance with a management agreement with the FGFWFC. The SFWMD also maintains public roads associated with the Miami Canal and L-5 levees. The road along the crest of the northern and eastern boundary levee is closed to the public because it is too narrow to accommodate two-way public vehicular use. Florida Power and Light maintains high-tension power lines and support pads on the southern boundary of the Water Management Area, and a small electrical transmission line along the Miami Canal levee. A series of 54 artificial islands were constructed in the south- and east-central portions of the area in 1974 and 1975.

The Rotenberger Wildlife Management Area is an area of Everglades marsh comprising 27,810 acres located in the southwest corner of Palm Beach County. The Rotenberger Wildlife Management Area is located immediately north of WCA-3 on the west side of the Miami Canal. It is 17 miles south of Lake Okeechobee and approximately 43 miles north of Everglades National Park. Holey Land Wildlife Management Area is immediately along the east boundary of the Rotenberger Wildlife Management Area. The area was named for Ray Rotenberger, who constructed a small camp and airfield in the area during the late 1950s or early 1960s. Approximately 6,300 acres of the original Environmentally Endangered Lands (EEL) project were purchased by the state on February 17, 1975. Since that time all but about 3,500 acres have been acquired. Although biologists were performing surveys and checking harvests in the Rotenberger area as early as 1970, and it may have been part of the Sawgrass Hunt Area at this time, the area was not included in the FGFWFC wildlife management area system until August 26, 1975. The Rotenberger Wildlife Management Area has been operated under lease # 3,581 dated November 13, 1979 from the Board of Trustees of the Internal Improvement Trust Fund (Trustees) since that time, with 6 major lease amendments (1987, 1989, 1990, 1994). This lease also includes some lands on the east side of the Miami Canal that are managed as part of the Holey Land Wildlife Management Area and some 14,000 acres south of the L-4 Canal in Broward County that are operated as part of the Everglades and Francis S. Taylor Wildlife Management Area (known as the Seminole Indian Lands).

Man-made structures include levees associated with the Miami Canal, Manley Ditch, L-4 Canal, the Florida Power and Light Powerline, the Guerry Sugarcane Farm (834 acres), and the abandoned Cousin's Ranch (940 acres) and Holper (100 acres)

Properties. An airstrip (formerly known as the Matthews Airfield) was built in the late 1950s or early 1960s by Ray Rotenberger, and there are several cabins and other structures associated with that camp. There used to be a cabin on Wall's Head, but it was abandoned and fell apart some years ago. Another cabin on Cousin's Ranch near the Miami Canal (Wildlife Officer's Camp) has also been abandoned, but is still standing. Several sets of culverts drain from Rotenberger Wildlife Management Area into the Miami Canal and L-4 Canal, and there are a series of culverts underneath the Powerline Road. There are two SFWMD water gauges in Rotenberger Wildlife Management Area (Rotenberger North and South). Sometime in the late 1950s or early 1960s an exploratory oil well was drilled near the south-central boundary. Using shellrock and material dredged from the wetlands a 2-acre support pad and access road to the L-4 North and Powerline levees was constructed, but this site was soon abandoned.

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

12 - Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project Part 1 (QQ - Part 1 and SS -Part 2)

Part 1 of the Water Conservation Area 3 Decompartmentalization and Sheetflow Enhancement Project includes the modification or removal of levees, canals, and water control structures in Water Conservation Area 3A and B located in western Broward County. This project includes backfilling the Miami Canal in Water Conservation Area 3 from 1 to 2 miles south of the S-8 Pump Station down to the East Coast Protective Levee. To make up for the loss of water supply conveyance to the Lower East Coast urban areas from the Miami Canal, the capacity of the North New River Canal within Water Conservation Area 3A will be doubled to convey water supply deliveries to Miami-Dade County as necessary. Modifications will also be made to the eastern section of Tamiami Trail which includes elevating the roadway through the installation of a series of bridges between L-31N Levee and the L-67 Levees. The eastern portion of L-29 Levee and Canal will also be degraded in the same area as the Tamiami Trail modifications.

The purpose of this project is to restore sheetflow and reduce unnatural discontinuities in the Everglades landscape. The project includes raising and bridging portions of Tamiami Trail and filling in portions of the Miami Canal within Water Conservation Area 3. Due to the dependencies of components, this project would be implemented with the Water Preserve Areas project that would create a bypass for water supply deliveries to Miami Canal using the North New River Canal.

14 - Loxahatchee National Wildlife Refuge Internal Canal Structures Project (KK)

This project includes two water control structures in the northern ends of the perimeter canals encircling the Loxahatchee National Wildlife Refuge (Water Conservation Area 1) located in Palm Beach County.

The purpose of this project is to improve the timing and location of water depths within the Refuge. It is assumed that these structures will remain closed except to pass Stormwater Treatment Area 1 East and Stormwater Treatment Area 1 West outflows and water supply deliveries to the coastal canals.

Chapter 9
LOWER EAST COAST REGION

PHYSICAL CONDITIONS - LOWER EAST COAST REGION

The Lower East Coast area, which consists of the coastal ridge section in Palm Beach, Broward, and Miami-Dade counties, is a strip of sandy land which lies east of part of the Water Conservation Areas (WCAs). The ground surface of the flatlands in the west ranges from about 25 feet NGVD (National Geodetic Vertical Datum) in the upper part of the region to about 5 feet NGVD in lower Miami-Dade County. The Atlantic Coastal Ridge is comprised of broad, low dunes and ridges with elevations ranging from 10 to 25 feet NGVD. This ridge area ranges from 2 to 4 miles in width at its northern edge to its southern edge in Miami. South of Miami the ridge becomes less pronounced but significantly wider.

The Lower East Coast area is the most densely populated part of the state. The largest population centers are near the coast and include the cities of Miami, Fort Lauderdale, Hollywood, and West Palm Beach. Water levels in coastal canals are controlled near the coastal shoreline to prevent overdrainage and to prevent salt water intrusion. Low water levels in these canals may enable salt water to migrate into the ground water, wellfields, and natural freshwater systems upon which the urban areas depend for a potable water supply.

This area is characterized by sandy flatlands to the west, the sandy coastal ridge, and the coastal marsh and mangrove swamp areas along the Atlantic seaboard. The northern portion, generally that part north of Miami-Dade County, marks the shore of a higher Pleistocene sea and occurs as one or more relict beach ridges. The southern portion appears to be marine deposited sands or marine limestones.

Extensive development has resulted in nearly complete urbanization of the coastal region from West Palm Beach southward through Miami, and physiographical characteristics of the region have been greatly overshadowed. South of Miami, in Miami-Dade County, this coastal area widens as the Everglades bends to the west to include urban areas and agricultural areas that extend almost to the southern coast. Miami-Dade County’s agricultural industry covers more than 83,000 acres in the southwest of the coastal metropolitan area. Vegetables, tropical fruits, and nursery plants are grown in this area.

Biscayne Bay is a shallow, tidal sound located near the extreme southeastern part of Florida. Biscayne Bay, its tributaries and Card Sound are designated by the state of Florida as aquatic preserves, while Card and Barnes sounds are part of the Florida Keys National Marine Sanctuary. A significant portion of the central and southern portions of Biscayne Bay comprise Biscayne National Park.

The original areal extent of Biscayne Bay approximated 300 square miles, but it has since undergone major areal modifications, particularly in its northern portions, as a result of development. The bay extends about 55 miles in a south-southwesterly direction from Dumfoundling Bay on the north to Barnes Sound on the south. It varies in width from less than 1 mile in the vicinity of the Atlantic Intracoastal Waterway passage to Dumfoundling Bay, to about 10 miles between the mainland and the Safety Valve Shoals to the east.

While there has been extensive dredging and filling within northern Biscayne Bay, the area still supports a productive and healthy seagrass bed and a few tracts of natural shoreline remain. Northern Biscayne Bay's headwaters are now considered to include dredged areas known as Maule Lake and Dumfoundling Bay, near the northern boundary of Miami-Dade County.

Central and, in particular, southern Biscayne Bay have been impacted less by development than northern bay. For instance, mangrove-lined coastal wetlands extend from Matheson Hammock Park south along the entire shoreline of Biscayne National Park, Card and Barnes Sounds, a distance of approximately 30 miles. These coastal wetlands are the largest tract of undeveloped wetlands remaining in South Florida outside of Everglades National Park, the Big Cypress National Preserve (BCNP), and the WCAs.

Biscayne National Park, in southern Biscayne Bay was established in 1980 to protect and preserve this nationally significant marine ecosystem consisting of mangrove shorelines, a shallow bay, undeveloped islands, and living coral reefs. The park is 180,000 acres in size and 95 percent water. The shoreline of southern Biscayne Bay is lined with a forest of mangroves and the bay bottom is covered with dense seagrass beds. The park has been designated a sanctuary for the Florida spiny lobster. Biscayne Bay and Biscayne National Park support a multitude of marine wildlife such as lobster, shrimp, fish, sea turtles, and manatees. The coral reefs within the Biscayne National Park support a diverse community of marine plant and wildlife.

Depending upon the flood stages reached, all the Central and Southern Florida Flood Control Project (C&SF Project) canals in adjacent Miami-Dade County can carry floodwaters to Biscayne Bay. However, much of the time, discharges from project canals represent primarily runoff or seepage from within the flood protected area of the county. These flows originate in the extensive networks of secondary drainage canals and storm sewers that discharge into the project canals. Supplementing the complex system of project canals and secondary drainage systems are many hundreds of other stormwater drainage canals and storm sewer outfalls within Miami-Dade County that discharge fresh water directly into Biscayne Bay.

EXISTING CONDITIONS - LOWER EAST COAST

The Lower East Coast Region functions as a multipurpose canal system with several objectives including: Flood control, urban water supply, industrial water supply, agriculture water use, protection and enhancement of wetland and estuarine systems,

prevention of saltwater intrusion, and recreation. The Lower East Coast system is capable of moving vast quantities of water during the wet season as well as supplying water (if available) during the dry season or as needed. Important freshwater canals are, from north to south, C-44, C-18, C-17, C-51, Hillsboro Canal, North New River Canal, Miami Canal, New River Canal, C-9, C-8, C-7, C-4, C-100, C-100c, C-1, C-102, C-103, C-109, C-110, C-111, and the South Miami-Dade Conveyance System.

Approximately half of the acreage farmed in the Lower East Coast is irrigated (UFBEBR, 1995). This region is highly dependent on the system of canals, levees, and other structures for flood control in the wet season and water supply in the dry season. Providing adequate drainage and flood control to the South Miami-Dade County agricultural area is a serious challenge because the farmland is directly adjacent to Everglades National Park. Evidence suggests that efforts to provide flood control to agriculture have resulted in over-drying the eastern portions of Everglades National Park and adversely affecting park ecology. Agricultural land does, however, provide a buffer between urbanization and Everglades National Park. Farmland is recognized as the preferred neighbor to natural areas because of its minimal impervious areas, open green space, and low population density. A strong agricultural economy in the Lower East Coast Region based on profitable crop production is the best defense against conversion of agricultural land to urban land.

The major estuaries in the Lower East Coast Region are Lake Worth Lagoon in Palm Beach County, West Lake in Broward County, and Biscayne Bay in Miami-Dade County. Lake Worth Lagoon was predominantly a freshwater system as recent as 100 years ago but was converted into a marine system with construction of permanent inlets to the ocean. West Lake is 1,400 acres of coastal wetland and mangroves in Hollywood along the Intracoastal Waterway. Biscayne Bay is a subtropical lagoon about 40 miles long that extends the length of Miami-Dade County.

Prior to urban development, freshwater discharge to Biscayne Bay consisted of flows through natural drainageways, overland flow, and ground water discharge from the Biscayne aquifer. However, the flow has changed from short bursts of rainy season flow through low drainageways, to regulated releases through drainage canals and decreased periods of ground water discharge (SFWMD, 1995). The construction of the canal system lowered the regional water table and subsequently reduced the amount of ground water flow into the bay. Ground water discharge into Biscayne Bay is believed to occur through both seepage and flow through subsurface leakage channels. A zone of seepage occurs around the perimeter of the bay where the water table elevation is higher than sea level. Subsurface flow occurs through natural leakage channels in the rock formations. Prior to the construction of drainage canals, springs flowed along the shore and emanated from the bottom of the bay. However, present day rates of ground water discharge into the bay are insufficient to produce such flowing springs (SFWMD, 1995).

Surface water flows into Biscayne Bay and Lake Worth Lagoon are primarily controlled by the system of canals, levees, and control structures built as part of the Central and South Florida Flood Control Project. Biscayne Bay receives freshwater surface flows from 17 surface water basins through 12 major coastal structures (SFWMD,

1995). Lake Worth Lagoon's fresh water input is principally from the C-51 Canal. The mechanism of surface water flow into Biscayne Bay and Lake Worth Lagoon are short intense pulses of fresh water discharged at discrete locations. This flow has replaced the historic sheetflow through the wetlands adjacent to the bay that existed before development of the canal system. Dry season flows into these water bodies are much lower than predrainage levels because most of the discharge into the bay is from stormwater releases from the canals. The canal discharge can bring sediments, heavy metals, pesticides, fertilizers, herbicides, nutrients, and low salinity plumes, which can all adversely affect the biota (SFWMD, 1995).

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - LOWER EAST COAST

The major watershed management/planning program ongoing in the Lower East Coast Region that will beneficially effect future water quality conditions is the state's Biscayne Bay Surface Water Improvement and Management (SWIM) Plan (SFWMD, 1995). The Biscayne Bay SWIM Plan has developed numerous water quality improvement related strategies and projects to reduce pollutant loading in Biscayne Bay and its tributaries. The extent to which this program is implemented, however, is limited due to funding constraints. Also, the Lake Worth Lagoon Management Plan will result in water quality improvement projects being implemented in the area. Although implementation of these water quality improvement activities will result in beneficial effects to Lower East Coast water bodies, the net future condition of water bodies in this region is not expected to improve due to the dramatic additional urban development, and associated additional pollutant loads, projected to occur in this region.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - PROJECTS

C-51

The current Design Memorandum was completed in February 1998 and submitted for review and approval and contains the same National Economic Development plan as the June 1992 Detailed Design Memorandum but references an "authorized" plan, which includes the replacement of the 2.5 square mile detention area with Stormwater Treatment Area (STA) 1E from the Everglades Construction Project (ECP). The "authorized" plan is also a product of the Technical Mediated Plan, which has been agreed to by the United States Department of Justice, United States Department of Interior (USDOI), United States Department of Army, the state of Florida, and the South Florida Water Management District (SFWMD). The state of Florida's Everglades Forever Act is based, in part, on the Technical Mediated Plan. The current "authorized" plan was authorized by the Water Resources and Development Act of 1996. The Act included language for the Western C-51 Project that additional work, as described in the ECP, shall be accomplished at full federal cost.

The authorized plan is recommended in the C-51 Design Memorandum and has many of the same physical features proposed in the 1992 Detailed Design Memorandum (described below). The project will provide 10-year flood protection for the western basin of C-51. The major physical difference between the 1992 Detailed Design Memorandum National Economic Development plan and the authorized plan is the replacement of the 1,600 acre detention area with the 5,350 acre "locally preferred" STA 1 East. The most significant modification will be the reduction of discharges to Lake Worth, with C-51 West Basin runoff directed instead to WCA-1 (Arthur R. Marshall Loxahatchee Wildlife Refuge). Runoff from the C-51 West Basin will pass through STA 1 East for water quality improvement prior to its discharge to WCA-1. In addition to the flood damage reduction benefits provided by the 1992 plan, the authorized plan would provide water quality improvement, reduction of damaging freshwater discharges to Lake Worth, and increased water supply for the Everglades and other users.

Northwest Dade Lake Belt Area

This component assumes that the conditions caused by the currently permitted mining exist and that the affects of any future mining are fully mitigated by the mining industry.

C-111 Project

Plan 6a, recommended in the United States Army Corps of Engineers (USACE) General Reevaluation Report (dated May 1994), will create the operational capability and flexibility to provide restoration of the ecological integrity of Taylor Slough and the eastern panhandle areas of the Everglades and maintain flood protection to the agricultural interests adjacent to C-111.

In the future without plan condition, C-111 Plan 6a will protect the natural values of a portion of Everglades National Park, and will maintain flood damage prevention within the C-111 Basin, east of L-31N and C-111. The project, which consists of both structural and nonstructural modifications to the existing project works within the C-111 Basin, will restore the hydrology in 128 square miles of Taylor Slough and its headwaters in the Rocky Glades. In addition, the hydroperiod and depths in 1,027 square miles of Shark River Slough are beneficially impacted by the higher stages in the Rocky Glades, resulting in a net increase in water volume within Shark River Slough. The project will provide adequate operational flexibility to incorporate management strategies that will evolve as a result of continued monitoring and studies.

Modified Water Deliveries to Everglades National Park

The Modified Water Deliveries to Everglades National Park Project was authorized by the Everglades National Park Protection and Expansion Act (Public Law 10229). The purpose of the project is to provide for structural modifications to the C&SF Project to enable the restoration of more natural water flows to Shark River Slough in Everglades National Park. The project is being implemented by the USACE in

conjunction with the acquisition of about 107,600 acres of land by the USDOI. Land acquisition for the levee, canal, and pump station for the flood mitigation system in the 8.5 Square Mile Area is underway.

This project is presently in the design and construction phase. Project construction is scheduled for completion in 2003. In the future without plan condition, the Modified Water Deliveries Project will provide more natural flows to Shark River Slough in Everglades National Park. Water flows will be spread across a broader section of Shark River Slough to include the east Everglades between L-67 Extension and L-31N.

The addition of water control structures and culverts will help to reestablish the natural distribution of water from WCA-3A into WCA-3B. Outlets from WCA-3B (S-355A & B) will be constructed to discharge into Northeast Shark River Slough. An existing levee and canal (L-67 Extension) along the eastern edge of the existing Everglades National Park boundary will also be removed. A Miccosukee Indian camp has been flood-proofed to avoid periodic flooding that would otherwise be caused by the project.

In order to prevent adverse flood impacts to the 8.5 Square Mile Area, the authorized project includes the construction of a seepage levee and canal around the western and northern edges of the area and a pump station (S-357) to remove excess seepage water. These project features are designed to maintain the existing level of flood protection in the residential area after the Modified Water Deliveries to Everglades National Park project returns water levels in Northeast Shark Slough to higher levels. A second pump station (S-356) will be constructed to pump excess seepage water from the L-31N Borrow Canal and residential area into the L-29 Borrow Canal. This water will then flow through culverts under US Highway 41 into Northeast Shark River Slough. A locally preferred option which would modify the project features in the 8.5 Square Mile Area is currently under consideration.

The structural modifications were designed to provide for maximum operational flexibility so that as more is learned through the continued iterative testing program, the operation of the project can be adjusted accordingly.

East Cape and Homestead Canals

The East Cape and Homestead canals, located within Everglades National Park, were constructed by local interests in the early 1900s to assist in the drainage of the Everglades prior to authorization of the park in 1936. After the Everglades National Park was established, the canals were plugged to prevent overdrainage of upstream freshwater systems and saltwater intrusion during high tides in the dry season. The passage of Hurricane Andrew resulted in extensive damage to both plugs. The project repaired the plugs in August 1997.

Interim Plan for Lower East Coast Regional Water Supply

The Interim Plan for Lower East Coast Regional Water Supply, produced by the SFWMD, identified water resources and water supply development projects, both structural and nonstructural, that should be initiated before 2000 to help meet the growing needs of the region (SFWMD, 1998d). The Interim Plan also identified local basin planning and other analytical programs to support the Lower East Coast 2020 Plan development and the Restudy.

The analyses conducted during the Lower East Coast Regional Water supply planning process demonstrated the need for increased storage capabilities throughout the system to help meet the increasing agricultural, environmental, and urban demands.

Wellfield Expansion in Service Areas 1 and 2

This component provides for relocation of future and some existing withdrawals from existing (1995) wellfields. Demands of the following utilities were evaluated assuming new wellfield locations: Lake Worth, Manalapan, Lantana, Boca Raton, Fort Lauderdale, Hollywood, and Hallandale. The evaluations assumed that, for these utilities, demands shifted to new wellfields were the same as those identified in the Draft Lower East Coast Regional Water Supply Plan (SFWMD, 1997g). Generally this means that 1995 levels of demands continued to be met from existing facilities while the portion of new demands beyond 1995 levels were met from the newly expanded wellfields. The new wellfields were generally evaluated as being located along the western boundary of each utility's service area.

Northeastern Broward Secondary Canal Recharge Network

This component includes pump stations and structures that would maintain higher levels in secondary canals in eastern Broward County between the Hillsboro and the North New River canals during the dry season. The control of seasonally higher canal elevations along the coast could help recharge the aquifers being used by local public water supply wellfields, and further reduce saline encroachment into the coastal freshwater aquifers. The selected canals are located where recharge from the canals would help to hold back the salt water front and protect the production capability of wellfields to the east.

Miami-Dade County Utility Aquifer Storage and Recovery (ASR)

This component includes ASR wells and related facilities that would be installed associated with wellfields of the Miami-Dade Water and Sewer Authority Department. These facilities would be operated to store water in the Floridan aquifer in the wet season and recover this water in the dry season. For the future without project condition, the evaluations were for a daily injection and recovery capacity of approximately 150 million gallons per day (MGD), a maximum recovery percentage of injected water of 90 percent, an annual injection period of seven months and an annual recovery period of five months.

Selected Elements of L-8 Project

The goal of the selected elements of the L-8 project is to redirect runoff from the southern L-8 Basin away from WCA-1 and the C-51 Canal to the West Palm Beach Water Catchment Area and the Loxahatchee Slough via the M Canal and the C-18 Canal. Subsequently, this water may be used to meet urban water supply demands for West Palm Beach, to meet environmental water demands of the West Palm Beach Catchment Area and Loxahatchee Slough, and may provide recharge for the Jupiter and Seacoast Utilities Authority wellfields. In addition, this project would be expected to reduce the incident and volume of harmful freshwater releases into Lake Worth Lagoon via the C-51 Canal. The project includes: an improved structural connection from the West Palm Beach Water Catchment Area to the Loxahatchee Slough ASR wells at the West Palm Beach Water Catchment Area or the Indian Trails Improvement District impoundment and a coastal recharge delivery system.

Minimum Flows and Levels (MFLs)

This component involves operational adjustments associated with the establishment of minimum flows and levels (MFLs) for the Biscayne aquifer and the Everglades. Minimum levels for the Biscayne aquifer involves maintaining water levels in coastal canals to prevent saltwater intrusion. MFLs for the Everglades focuses on preservation of hydric soils. No net outflow from WCAs are allowed if water levels are less than minimum level marsh triggers or less than minimum operating criteria in the canals of the Loxahatchee National Wildlife Refuge (WCA-1): 14 feet, WCA-2A: 10.5 feet, WCA-3A: 7.5 feet. Marsh level triggers will be those used in the Interim Plan for Lower East Coast Regional Water Supply.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - CRITICAL RESTORATION PROJECTS

C-4 Water Control Structure

This project involves construction of a gated control structure (S-380) in the C-4 canal at the congruence with the Dade-Broward Levee. A large volume of seepage is lost from WCA-3B to the coast because the existing water management system cannot raise surface and ground water levels high enough to prevent seepage. Construction of a gated control structure with five 72-inch diameter culverts with remotely operated slide gates will increase aquifer recharge and surface and subsurface storage of water to reduce seepage as well as enhance habitat for plants and animals. The total cost is estimated at $2.05 million.

Western C-11 Water Quality Improvement

The purpose of this project is to improve the quality and timing of stormwater discharges from the Western C-11 Basin to the Everglades Protection Area. The S-9 Pump Station currently pumps urban and agricultural stormwater runoff from the Western C-11 Basin directly into WCA-3A. This project will be completed in two phases. Phase 1 will involve installation of four new seepage return pumps adjacent to the S-9 Pump Station. Phase 2 will involve construction of a new divide structure in the C-11 canal, approximately 0.5 miles east of US Highway 27. Seepage return pumps will include two 75-cfs electric pumps and two 175-cfs diesel pumps. The divide structure will be a gated concrete spillway with a discharge capacity of 2,880 cfs. During non-flood conditions, the new structure is intended to separate seepage from stormwater runoff, allowing return of relatively clean seepage waters to WCA-3A using the new seepage return pumps. The estimated cost of the project is $9.6 million.

WATER QUALITY PROBLEMS AND OPPORTUNITIES

For Restudy planning purposes, the Lower East Coast consists of Palm Beach, Broward, and Miami-Dade counties, including Biscayne Bay and Lake Worth Lagoon. According to the Florida Department of Environmental Protection's (FDEP) 1998 303(d) list, approximately 42 water body segments (both fresh and marine water bodies) within the Lower East Coast are use-impaired. Pollutants/water quality constituents causing impairment include low levels of dissolved oxygen (DO), high levels of mercury (based on fish consumption advisories) and other trace metals, and high levels of coliform bacteria, total suspended solids (TSS), biochemical oxygen demand (BOD), and un-ionized ammonia.

Four of the main C&SF Project canals delivering flows from Lake Okeechobee and the WCAs (the West Palm Beach, Hillsboro, New River, and Miami canals) traverse the Lower East Coast. In addition to conveying Lake Okeechobee and WCA flows, the C&SF Project canals and a network of connecting secondary and tertiary canals provide drainage in the Lower East Coast, which conveys stormwater runoff and attendant pollution loads to estuarine waters. Management of stormwater runoff and flooding via the existing canal system has been implicated as the chief cause of water quality degradation in the region, particularly in the northern portion of Biscayne Bay.

Improving water quality in the Lower East Coast to meet water quality standards in all impaired water bodies will likely be difficult, considering the extent of urban development, minimal or nonexistent water quality treatment for nonpoint source runoff, and other direct (point source) and indirect discharges adversely affecting water quality in the Lower East Coast. Water quality conditions are expected to worsen in the Lower East Coast (central and southern Palm Beach, Broward, and Miami-Dade counties) by 2050 compared to current conditions. FDEP's 1996 Section 305(b) report to the United States Environmental Protection Agency (USEPA) describing water quality conditions in the region indicates that most of the region exhibits "fair" or "good" water quality. The report goes on to state that most pollution (in the region) comes from stormwater, although

bacteriological contamination from wastewater discharges and septic tanks is also a significant problem, particularly in the Miami River, downstream in Biscayne Bay, and urban areas west of the intracoastal waterway in Broward County and north of the New River. Water quality conditions in receiving water bodies in 2050 are expected to be further degraded, due to the developed condition of the watershed and the continued accumulation of pollutants in sediments in receiving water bodies.

Nearly all of this heavily urbanized watershed drains to estuarine waters. Net pollution loads, especially from nonpoint sources, to receiving waters in the Lower East Coast are expected to increase as a result of projected population increases. The expected increase in net pollution loads may not be directly proportional to population growth. New growth and urban/suburban development in the Lower East Coast must comply with water quality treatment requirements for nonpoint source runoff, whereas much of the existing development in the Lower East Coast does not include facilities for treatment of nonpoint pollution sources. Nevertheless, the projected addition of approximately 2.7 million people to the region is expected to cause water quality conditions to be further degraded, especially in those basins which are already stressed by existing pollution loads.

In Palm Beach County, the Lake Worth Lagoon Estuary is the receiving water body for most of that urban watershed. There are approximately eight use-impaired water bodies in Palm Beach County on the FDEP 1998 303(d) list. Listed water body segments include coastal canals and freshwater areas further inland. Water quality conditions are expected to improve (in terms of estuarine salinity targets) as a result the C-51 (STA 1 East) Project, which will divert freshwater discharges to Lake Worth Lagoon to a treatment area prior to discharge to WCA-1. However, net nonpoint source pollution loads to Lake Worth Lagoon may increase commensurate with increases in population and development.

Although there are no extensive estuarine water bodies in Broward County, remaining mangroves in southern Broward County canals and along the Intracoastal Waterway provide similar habitat. There are approximately 21 303(d)-listed use-impaired water body segments in Broward County. These water body segements are primarily coastal canals providing drainage. Due to the extent of existing urban development in the watersheds of those canals, it is not likely that there will be a significant increase in future nonpoint source pollution loads into these water bodies. However, it is also unlikely that basinwide stormwater best management practices (BMPs), e.g., retention/detention facilities, and filtration, can be implemented effectively in heavily urbanized watersheds, due to the lack of available land for such facilities. Future basin planning efforts during TMDL development and implementation may result in more effective controls of other direct (point source) and indirect discharges of pollutants (e.g., car washes and other industrial facilities). At best, the long-term prognosis for improving all use-impaired water bodies in coastal areas of Broward County is uncertain.

In Miami-Dade County, approximately 13 water body segments were identified as use-impaired on the FDEP's 1998 303(d) list. Most are coastal canals providing drainage of runoff to Biscayne Bay. Biscayne Bay is the largest estuarine water body in the Lower East Coast, and is the receiving water body for most of the developed area of Miami-Dade

County. Most of Biscayne National Park is located within the central and southern portion of the Biscayne Bay Estuary. As with some of the Broward County canals, controlling nonpoint sources of runoff in heavily urbanized areas in Miami will be difficult, due to the lack of available land for basinwide BMPs. Some incremental improvement of nonpoint source pollution loads may be realized through the basin management plans to be developed by the FDEP. Point sources and other direct discharges of pollutants to Biscayne Bay and tributary canals should be significantly improved if basin management plans are fully implemented. However, overall, it is not expected that water quality in coastal canals draining to Biscayne Bay will be improved to the point that all surface water quality standards will be achieved. Furthermore, any water quality benefits achieved as a result of the Biscayne Bay SWIM Plan may be offset by increases in nonpoint source pollution loads associated with projected population increases.

LAND USE - LOWER EAST COAST

Agriculture

Broward and Miami-Dade counties are included in this region. Although Palm Beach County is also a part of this region physiographically, agriculture issues for Palm Beach County were addressed within the Everglades Agriculture Area Region. More than 100,000 acres are farmed in Broward and Miami-Dade counties (UFBEBR, 1995). This region is characterized by small farms averaging less than 50 acres, with very high productivity of more than $3,500 per acre (UFBEBR, 1995). A variety of crops are produced including vegetables, tropical fruits, and nursery plants. Hurricane Andrew, which struck southern Miami-Dade County in 1992, caused significant damage to agricultural areas. Many fruit tree orchards were damaged or destroyed. Statistics from 1996 indicate that avocado production had recovered, but mango and lime orchards had not yet recovered from the hurricane damage (FASS, 1997b). Total acres of tropical fruit production in Miami-Dade County remain approximately 7,000 less than prehurricane levels (FASS, 1996e). Foliage plant production is also a major business in Broward and Miami-Dade counties. More than 120 million square feet were devoted to the foliage crop in Broward, Miami-Dade, and Palm Beach counties in 1996 (FASS, 1997a).

Agricultural production and services employ approximately 18,000 people in this region representing a $23 million payroll (UFBEBR, 1995). The total market value of agricultural products from this region is almost $400 million (UFBEBR, 1995). Miami-Dade County ranks second in the state for total market value of agricultural products (UFBEBR, 1995).

Approximately half of the acreage farmed in the Lower East Coast is irrigated (UFBEBR, 1995). This region is highly dependent on the system of canals, levees, and other structures for flood control in the wet season and water supply in the dry season. Providing adequate drainage and flood control to the south Miami-Dade County agricultural area is a serious challenge because the farmland is directly adjacent to Everglades National Park. Evidence suggests that efforts to provide flood control to agriculture have resulted in over-drying the eastern portions of Everglades National Park

adversely affecting Park ecology. Agricultural land does, however, provide a buffer between urbanization and Everglades National Park. Farmland is recognized as the preferred neighbor to natural areas because of its minimal impervious areas, open green space, and low population density. A strong agricultural economy in the Lower East Coast Region based on profitable crop production is the best defense against conversion of agricultural land to urban land.

Urban

The Lower East Coast supports the densest population in the state of Florida. Population in the Lower East Coast is expected to increase by 35 percent, from 4,518,401 in 1995 to 6,086,700 in 2020. Land use in the Lower East Coast is primarily related to urban activities and the infrastructure (such as transportation and utilities) needed to support this large number of people. Urban demands are expected to increase by 39 percent by 2020. If however, the Lower East Coast experiences a in-10 year drought during the planning period, than the projected urban and agricultural demand will increase about 43 percent.

South Miami-Dade County is defined as the area south of SW 184th St. (Eureka Drive). US Highway 1 bisects the area. West of US 1, land uses are primarily estate and low-density residential uses within the Urban Development Boundary (UDB). Other higher density residential uses, business/office, and industrial uses are found in Homestead and Florida City. The Redlands and other agricultural areas are west across the UDB and make up most of the approximately 55,000 acres of agricultural lands that remain in south Miami-Dade County. The Urban Expansion Area designation identifies agricultural lands in south Miami-Dade County as the next place for development.

Miami-Dade and Broward counties have the most pronounced sprawl patterns. The SFRPC describes the change:

> Essentially rural areas in the western extremes of Broward and Miami-Dade counties have given way to sprawling suburban residential development and shopping centers. Indeed, these have been an important component of the economic growth that has taken place in the region. During the process, the once significant rural population has virtually disappeared, resulting in the emergence of a distinctly urban character to the region. Miami-Dade County was already 94 percent urban in 1950, and 77 percent of Broward County's population lived in urban areas. By 1980, both counties were 99 percent urban. Only in Monroe County did a significant portion of the population still live outside of urban areas in 1990 (27 percent), consistent with the special characteristics of that county's political geography (SFRPC, 1996).

Palm Beach County is experiencing a similar change. The Treasure Coast Regional Planning Council (TCRPC) reports that while the coastal area of Palm Beach County from Riveria Beach to Boca Raton, is heavily urbanized, much of the recent population growth has occurred in the western unincorporated areas (TCRPC, 1996). This sprawling urbanization tended to push agricultural land uses off of prime farmlands into the less suitable wetlands fringing the coastal ridge. As the development continues to expand it is

expected that it will consume the remaining agricultural lands (both historic and recent) and eventually make its way into the remaining unprotected wetlands of the counties. The SFRPC explains that the region, in the response to the pressure of continued population growth, is likely to yield to the pressure to continue to urbanize.

Additional Lower East Coast urban-related land uses include the Florida Power and Light nuclear power plant at Turkey Point, landfills, rock mining, Homestead Air Force Base, and a number of marinas scattered throughout Biscayne Bay and Lake Worth Lagoon.

Everglades National Park

Everglades National Park encompasses 2,353 square miles of wetlands, uplands, and submerged lands at the southern end of the Florida peninsula. The topography is extremely low and flat, with most of the area below 4 feet NGVD. The highest elevations are found in the northeastern section of the park and are from 6 to 7 feet NGVD. The saline wetlands, including mangrove and buttonwood forests, salt marshes, and coastal prairie that fringe the coastline are subject to the influence of salinity from tidal action.

Everglades National Park, authorized by Congress in 1934 and established in 1947, was established to protect the unique tropical biological resources of the southern Everglades ecosystem. It was the first national park to be established to preserve purely biological (versus geological) resources. The park's authorizing legislation mandated that it be managed as:

> …wilderness, [where] no development… or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna and the essential primitive natural condition now prevailing in this area.

This mandate to preserve wilderness is one of the strongest in the legislative history of the National Park System.

Everglades National Park has been recognized for its importance, both as a natural and cultural resource as well as for its recreational value, by the international community and the national and state governments. At the international level, the park is a World Heritage Site, an International Biosphere Reserve, and a Wetland of International Significance. In 1978, Congress designated much of the park, (86 percent) as Wilderness under the Wilderness Act of 1964. In 1997, this area was redesignated the Marjory Stoneman Douglas Wilderness. Hell's Bay Canoe Trail and the Wilderness Waterway are designated National Trails. The state of Florida has designated the park an Outstanding Florida Water.

The park preserves a unique landscape where the temperate zone meets the subtropics, blending the wildlife and vegetation of both. The landscape includes sawgrass sloughs, tropical hardwood hammocks, offshore coral reefs, mangrove forests, lakes, ponds, and bays, providing habitat for dozens of threatened and endangered species of

plants and animals. It is the largest designated wilderness, at 1,296,500 acres, east of the Rocky Mountains. It protects the largest continuous stand of sawgrass prairie in North America, the most significant breeding grounds for tropical wading birds in North America, over 230,100 acres of mangrove forest (the largest in the western hemisphere), a nationally significant estuarine complex in Florida Bay and significant ethnographic resources, revealing 2,000 years of human occupation.

Increased Pressure on Open Land

As this trend continues the availability of developable land decreases putting pressure on the unprotected wetlands and agricultural lands. There is a fear that agriculture lands will come under increased pressure as lands are converted into subdivisions or set aside for environmental protection. South Miami-Dade County typifies this trend. As people continue to move into the county pushing the north and central regions to capacity, the remaining undeveloped areas in south Miami-Dade County become the easiest option for future growth. The 80,000 acres of agricultural lands in the Redland Region and other parts of unincorporated Miami-Dade County are increasingly under development pressure. In the 1995 Evaluation and Appraisal Report Miami-Dade included a recommendation that a Farmland Retention Study be conducted, noting that:

> By [the Evaluation and Appraisal Report for 2000] the currently planned Urban Development Boundary will be substantially built out and the County will be facing the prospect of having to plan for the urbanization of an additional 20 square miles of land, if we continue the past trend of low-density development.

There are several other efforts to halt these land conversion and development trends including the following: Eastward Ho!, Brownfields, and the South Miami-Dade U.S. 1 Corridor Project.

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

P6 - Wastewater Reuse Technology - Pilot Project (West Palm Beach and Miami-Dade Counties)

Currently, two projects involve the advanced treatment of wastewater. This pilot project will address water quality issues associated with discharging reclaimed water into natural areas such as the West Palm Beach Water Catchment Area, Biscayne National Park, and the Bird Drive Basin as well as determine the level of superior treatment and the appropriate methodologies for that treatment. A series of studies will be conducted to help determine the level of treatment needed.

Pilot facilities will be constructed to determine the ecological effects of using superior, advanced treated reuse water to replace and augment freshwater flows to Biscayne Bay and to determine the level of superior, advanced treatment required to prevent degradation of freshwater and estuarine wetlands and Biscayne Bay. The

constituents of concern in wastewater will be identified and the ability of superior, advanced treatment to remove those constituents will be determined.

In addition, a pilot facility will be constructed to treat wastewater from the East Central Regional Wastewater Treatment Facility using advanced and superior wastewater treatment processes to remove nitrogen and phosphorus. After treatment, the wastewater will be used to restore 1,500 acres of wetlands and to recharge wetlands surrounding the city of West Palm Beach's wellfield.

A portion of the treated wastewater will be used to recharge a residential lake system surrounding the city's wellfield and a Palm Beach County wellfield. Besides serving as a pilot project for wetlands based water reclamation this project will reduce a portion of the city's dependence on surface water from Lake Okeechobee during dry or drought events. In addition, approximately 2,000 acres of wetlands would be created or restored. Other benefits include aquifer recharge and replenishment, reduction of water disposed in depe injection wells and a reduction of stormwater discharge to tide.

17a - Pal-Mar and J.W. Corbett Wildlife Management Area Hydropattern Restoration (OPE)

This element includes water control structures, canal modifications and the acquisition of 3,000 acres located between Pal-Mar and the J.W. Corbett Wildlife Management Area in Palm Beach County.

The purpose of this separable element is to provide hydrologic connections between the Corbett Wildlife Management Area and: (1) the Moss Property, (2) the C-18 Canal, (3) the Indian Trail Improvement District, and (4) the L-8 Borrow Canal, in addition to extending the spatial extent of protected natural areas. These connections would relieve the detrimental effects on native vegetation frequently experienced during the wet season and form an unbroken 126,000-acre greenbelt extending from the Dupuis Reserve near Lake Okeechobee across the J.W. Corbett Wildlife Management Area and south to Jonathan Dickinson State Park.

17b - C-51 and Southern L-8 Reservoir (K - Part 1 and GGG)

This separable element includes a combination above ground and in-ground reservoir. The project has a total storage capacity of 48,000 acre-feet located immediately west of the L-8 Borrow Canal and north of the C-51 Canal in Palm Beach County. Other construction projects include ASR wells with a capacity of 50 million gallons per day and associated pre-and post-water quality treatment to be constructed in the city of West Palm Beach (Lake Mangonia), a series of pumps, water control structures and canal capacity improvements in the M Canal. The initial design for the reservoir assumed a 1,800-acre reservoir with 1,200 of usable acres and water levels fluctuating from 10 feet above grade to 30 feet below grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design. The initial design of the wells assumed 50 wells, each with a capacity of 5 million gallons per day with chlorination for

pre-treatment and aeration for post-treatment. The level and extent of treatment and number of the ASR wells may be modified based on findings from a proposed ASR pilot project.

The purpose of this separable element is to increase water supply availability and flood protection for northern Palm Beach County areas. It will also provide flows to enhance hydroperiods in the Loxahatchee Slough, increase baseflows to the Northwest Fork of the Loxahatchee River and reduce high discharges to the Lake Worth Lagoon.

Water will be pumped into the reservoir from the C-51 Canal and Southern L-8 Borrow Canal during the wet season, or periods when excess water is available, and returned to the C-51 and Southern L-8 during dry periods. Additional elements will also direct excess water into the West Palm Beach Water Catchment Area. During periods when the West Palm Beach Water Catchment Area is above desirable stages, 50 million gallons per day will be diverted to Lake Mangonia for storage in the ASR wells. The reservoir portion of this component may be implemented under a previous authorization.

17c - Lake Worth Lagoon Restoration (OPE)

This separable element includes sediment removal and trapping within the C-51 Canal and sediment removal or trapping within a 2.5 mile area downstream of the confluence of the C-51 Canal and the Lake Worth Lagoon located in Palm Beach County. A prototype facility will be conducted to determine if the lagoon sediments will either be removed or trapped.

The purpose of this separable element is to improve water quality and allow for the re-establishment of sea grasses and benthic communities. The elimination of the organically enriched sediment from the C-51 Canal discharge will provide for long term improvements to the Lagoon and enable success for additional habitat restoration and enhancement projects planned by Palm Beach County.

17d - C-17 Backpumping and Treatment (X)

This separable element includes backpumping facilities and a stormwater treatment area with a total storage capacity of approximately 2,200 acre-feet located in northeastern Palm Beach County. The initial design for the stormwater treatment area assumed 550 acres with water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design, and will address appropriate pollution load reduction targets necessary to protect receiving waters (West Palm Beach Catchment Area).

The purpose of this separable element is to increase water supplies to the West Palm Beach Water Catchment Area and Loxahatchee Slough by capturing and storing excess flows currently discharged to the Lake Worth Lagoon from the C-17 Canal.

Excess C-17 Canal water will be backpumped through existing canals and proposed water control structures to the stormwater treatment area which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

17e - C-51 Backpumping and Treatment (Y)

This separable element includes backpumping facilities and a stormwater treatment area with a total storage capacity of approximately 2,400 acre-feet located in Palm Beach County. The initial design for the stormwater treatment area assumed 600 acres in size with the water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning and design, and will address appropriate pollution load reduction targets necessary to protect receiving waters (West Palm Beach Water Catchment Area).

The purpose of this separable element is to increase water supplies to the West Palm Beach Water Catchment Area and Loxahatchee Slough by capturing and storing excess flows currently discharged to the Lake Worth Lagoon from the C-51 Canal.

Excess C-51 Canal water will be backpumped through existing and proposed water control structures and canals to the stormwater treatment area which will provide water quality treatment prior to discharge into the West Palm Beach Water Catchment Area.

18b - L-8 Basin ASR (K - Part 2)

This separable element includes a combination above ground and in-ground reservoir. Other construction projects include aquifer storage and recovery wells with a total capacity of 50 million gallons per day and associated pre- and post-water quality treatment to be constructed in the city of West Palm Beach (Lake Mangonia), a series of pumps, water control structures, and canal capacity improvements in the M Canal. The initial design for the reservoir assumed a 1,800-acre reservoir with 1,200 usable acres with the water levels fluctuating from 10 feet above grade to 30 feet below grade. The reservoir has storage capacity of approximately 48,000 acre-feet located immediately west of the L-8 Borrow Canal and north of the C-51 Canal in Palm Beach County. The final size, depth and configuration of this facility will be determined through more detailed planning and design. The initial design of the wells assumed 50 wells, each with a capacity of 5 million gallons per day with chlorination for pre-treatment and aeration for post-treatment. The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on findings from a proposed aquifer storage and recovery pilot project.

The purpose of this separable element is to increase water supply availability and flood protection for northern Palm Beach County areas. It will also provide flows to enhance hydroperiods in the Loxahatchee Slough; increase base flows to the Northwest Fork of the Loxahatchee River, and reduces high discharges to the Lake Worth Lagoon.

Water will be pumped into the reservoir from the C-51 Canal and Southern L-8 Borrow Canal during the wet season, or periods when excess water is available, and returned to the C-51 and Southern L-8 during dry periods. Additional separable elements move excess water into the West Palm Beach Water Catchment Area. During periods when the West Palm Beach Water Catchment Area is above desirable stages, 50 million gallons per day will be diverted to Lake Mangonia for storage in the aquifer storage and recovery wells. The reservoir portion of this component may be implemented under a previous authorization.

19b - Protect and Enhance Existing Wetland Systems along Loxahatchee National Wildlife Refuge including the Strazzulla Tract (OPE)

This separable element includes water control structures and the acquisition of 3,335 acres located in Palm Beach County. The purpose of this separable element is to provide a hydrological and ecological connection to the Loxahatchee National Wildlife Refuge and expand the spatial extent of protected natural areas. This land will act as a buffer between higher water stages to the west and lands to the east that must be drained. This increase in spatial extent will provide vital habitat connectivity for species that require large unfragmented tracts of land for survival. It also contains the only remaining cypress habitat in the eastern Everglades and one of the few remaining sawgrass marshes adjacent to thecoastal ridge. This is a unique and endangered habitat that must be protected. This are provides an essential Everglades landscape heterogeneity function.

19c - Hillsboro Site 1 Impoundment (M - Part 1)

This separable element includes an above ground reservoir with a total storage capacity of approximately 15,000 acre-feet located in the Hillsboro Canal Basin in southern Palm Beach County. The initial design of the reservoir assumed 2,460 acres with water levels fluctuating up to 6 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study.

The purpose of this separable element is to supplement water deliveries to the Hillsboro Canal during dry periods thereby reducing demands on Lake Okeechobee and the Loxahatchee National Wildlife Refuge. Water from the Hillsboro Canal will be pumped into the reservoir during the wet season or periods when excess water is available. Water will be released back to the Hillsboro Canal to help maintain canal stages during the dry-season.

19d - Western C-11 Diversion Impoundment and Canal and Water Conservation Areas 3A and 3B Levee Seepage Management and North New River Conveyance Improvements (Q, O, and SS Part 1)

This separable element includes canals, levees, water control structures, and a stormwater treatment area/impoundment with a total storage capacity of 6,400 acre-feet located in western Broward County. The initial design of the stormwater treatment area/ impoundment assumed 1,600 acreas with water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study. Detailed design of this project will address appropriate pollution load reduction targets necessary to protect receiving waters.

The purpose fo this separable element is to divert and treat runoff from the western C-11 Basin that is presently discharged into WCA-3A, control seepage from WCAs 3A and 3B by improving groundwater elevations, and maintain flood protection for the western C-11 Basin.

Runoff in the western C-11 Canal Basin that was previously back-pumped into WCA-3A throught the S-9 Pump Station will be diverted into the C-11 Stormwater Treatment Area/Impoundment and then into either the North Lake Belt Storage Area, the C-9 Stormwater Treatment Area/Impoundment, or WCA-3A after treatment, as applicable.

Mitigation of lost water supply conveyance to the Lower East Coast urban areas caused by the backfilling of the Miami Canal in WCA-3 is made up in this project. The capacity of the North New River Canal south of the proposed Everglades Agricultural Area Storage Reservoir is doubled to convey additional water supply deliveries to Miami-Dade County as necessary. The capacities of S-351 and S-150 are doubled to allow the additional water supply deliveries to be made to Miami-Dade County via the improved North New River Canal. In addition, the conveyance of the L-33 and L-37 borrow canals west of US 27 is increased as necessary to pass the additional flows.

19e - C-9 Stormwater Treatment Area/Impoundment (R)

This separable element includes canals, levees, water control structures and a stormwater treatment area/impoundment with a total capacity of approximately 10,000 acre-feet, located in the western C-9 Basin in Broward County. The initial design of the stormwater treatment area/impoundment assumed 2,500 acres with water levels fluctuating up to 4 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study and will address appropriate pollution load reduction targets necessary to protect receiving waters.

The purpose of this separable element is to provide treatment of runoff stored in the North Lake Belt Storage Area, enhance groundwater recharge within the basin,

maintain seepage control for WCA-3 and buffer areas to the west, and provide flood protection for the western C-9 Basin. Seepage from the C-9 Stormwater Treatment Area/ Impoundment will be collected and returned to the impoundment.

19f- Dade-Broward Levee/Pennsuco Wetlands (BB)

This separable element includes water control structures and modifications to the Dade-Broward Levee and associated conveyance system located in Miami-Dade County. The final size and configuration of these facilities will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study.

The purpose of this separable element is to reduce seepage losses to the east from the Pennsuco Wetlands and southern WCA-3B, enhance hydroperiods in the Pennsuco Wetlands, and provide recharge to Miami-Dade County's Northwest Wellfield.

19h - Bird Drive Recharge Area (U)

This separable element includes pumps, water control structures, canals, and an above ground recharge area with a total storage capacity of approximately 11,500 acre-feet located in western Miami-Dade County. The initial design of the recharge facility assumed 2,877 acres with the water level fluctuating up to 4 feet above grade. Final design will seek to enhance and maintain the continued viability of wetlands within the basin. The final size, depth and configuration of these facilities including treatment requirements will be determined through more detailed planning and design to be completed as a part of the Water Preserve Areas Feasibility Study and will address appropriate pollution load reduction targets necessary to protect downstream receiving surface waters.

The purpose of the separable element is to recharge groundwater and reduce seepage from the Everglades National Park buffer area by increasing water table elevations east of Krome Avenue. The facility will also provide C-4 flood peak attenuation and water supply deliveries to the South Dade Conveyance System and Northeast Shark River Slough.

Inflows from the western C-4 Canal Basin and from the proposed West Miami-Dade Wastewater Treatment Plant will be pumped into the Recharge Area. Inflows from the wastewater treatment plant will stop when the Recharge Area depth exceeds 3 feet above ground and will be diverted to a deep well injection disposal system. Recharge area outflows will be prioritized to meet: 1) groundwater recharge demands, 2) South Dade Conveyance System demands and 3) Northeast Shark River Slough demands when supply is available. Regional system deliveries will be routed through the seepage collection canal system of the Bird Drive Recharge Area to the South Dade Conveyance system.

20 - Palm Beach County Agricultural Reserve Reservoir Project (VV - Part 1)

This project includes an above ground reservoir with a total storage capacity of approximately 20,000 acre-feet located in the western portion of the Palm Beach County Agricultural Reserve. The initial design for the reservoir assumed 1,660 acres with water levels fluctuating up to 12 feet above grade. The final size, depth and configuration of these facilities will be determined through more detailed planning and design.

The purpose of this project is to supplement water supply deliveries for central and southern Palm Beach County by capturing and storing excess water currently discharged to the Lake Worth Lagoon. These supplemental deliveries will reduce demands on Lake Okeechobee and the Loxahatchee National Wildlife Area. It is assumed that this facility could also be designed to achieve water quality improvements in downstream receiving waters, depending upon pollutant loading conditions in the watershed.

The reservoir will be filled during the wet season with excess water from the western portions of the Lake Worth Drainage District and possibly from Acme Basin B. Water will be returned to the Lake Worth Drainage District canals to help maintain canal stages during the dry-season. If water is not available in the reservoir, existing rules for water delivery to this region will be applied.

28 - Biscayne Bay Coastal Wetlands Project (FFF and OPE)

This project includes pump stations, spreader swales, stormwater treatment areas, flowways, levees, culverts, and backfilling canals located in southeast Miami-Dade County and covers 13,600 acres from the Deering Estate at C-100C, south to the Florida Power and Light Turkey Point power plant, generally along L-31E.

The purpose of this project is to rehydrate wetlands and reduce point source discharge to Biscayne Bay. The proposed project will replace lost overland flow and partially compensate for the reduction in groundwater seepage by redistributing, through a spreader system, available surface water entering the area from regional canals. The proposed redistribution of freshwater flow across a broad front is expected to restore or enhance freshwater wetlands, tidal wetlands, and nearshore by habitat. Sustained lower-than-seawater salinities are required in tidal wetlands and the nearshore bay to provide nursery habitat for fish and shellfish. This project is expected to create conditions that will be conducive to the re-establishment of oysters and other components of the oyster reef community. Diversion of canal discharges into coastal wetlands is expected not only to re-establish productive nursery habitat all along the shoreline but also to reduce the abrupt freshwater discharges that are physiologically stressful to fish and benthic invertebrates in the bay near canal outlets.

More detailed analyses will be required to define target freshwater flows for Biscayne Bay and the wetlands within the redistribution system. The target(s) will be based upon the quality, quantity, timing and distribution of flows needed to provide and

maintain sustainable biological communities in Biscayne Bay, Biscayne National Park and the coastal wetlands. Additionally, potential sources of water for providing freshwater flows to Biscayne Bay will be identified and evaluated to determine their ability to provide the target flows.

The component Biscayne Bay Coastal Canals as modeled in D-13R and the Critical Project on the L-31E Flowway Redistribution are smaller components of the Biscayne Bay Coastal Wetlands project described above.

Chapter 10
FLORIDA BAY AND THE KEYS REGION

PHYSICAL CONDITIONS - FLORIDA BAY

Florida Bay and the Ten Thousand Islands comprise 1,500 square miles of Everglades National Park. The bay is shallow, with an average depth of less than three feet. To the north is the Florida mainland and to the south lie the Florida Keys. Sheetflow across marl prairies of the southern Everglades and 20 creek systems fed by Taylor Slough and the C-111 Canal provide direct inflow of fresh surface water and ground water recharge. Surface water from Shark River Slough, the subregion's largest drainage feature, flows into Whitewater Bay and also may provide essential ground water recharge for central and western Florida Bay. Exchange with Florida Bay occurs as this lower salinity water mass flows around Cape Sable into the western subregion of the bay.

EXISTING CONDITIONS - EVERGLADES NATIONAL PARK AND FLORIDA BAY WATER MANAGEMENT

The Everglades National Park Drainage Basin is described in Cooper and Roy, 1991. The Everglades National Park Drainage Basin has an area of 1,684.5 square miles and is located in western Miami-Dade County (886.5 square miles), northwestern Monroe County (773.9 square miles) and southwestern Collier County (24.1 square miles) (Cooper and Roy, 1991). The basin includes all of Everglades National Park, the Everglades National Park expansion area, the remainder of the eastern Everglades and portions of the southern Glades Wildlife Environmental Area.

Internal Project Structures

The drainage basin for Everglades National Park represents primarily undeveloped land managed for the park and its inflows. Central and South Florida Project structures are generally external to the basin and installed primarily for environmental purposes for the park or to separate drainage between the park and the area to the east of the L-31N and L-31. There are six project structures internal to this basin: the L-67 Extension, the plug in the Buttonwood Canal, S-175, S-332, S-346, and S-347. The L-67 Extension was installed to separate the portions of Everglades National Park, Western Shark Slough from the privately owned lands east, which included the northeastern portions of Shark Slough. The associated canal serves as a getaway channel allowing water to move away from the S-12 structures (Cooper and Roy, 1991). The Buttonwood Canal plug was installed at the mouth of the Buttonwood Canal on Florida Bay to prevent further intrusion of saltwater and improve conditions upstream of the canal. The S-175 and S-332 are used to deliver water to Taylor Slough, while S-346 and S-347 are used to control flow in the L-67 Extension.

External Project Inflows

Managed inflows to Everglades National Park are from the eastern farmland and from the north as an outlet of Water Conservation Areas (WCA) 3A and 3B. The managed flows delivered from WCA-3A through the S-12 structures, S-333, and from WCA-3B through G-69. Other inflow points include the L-31W Borrow Canal through S-332 and S-175 and from the C-111 between S-18C to S-197 as overland flow though the degraded canal berm into the panhandle of Everglades National Park.

Project Structures Controlling Inflow

Project structures controlling flow to the Everglades National Park Basin include: S-12A, S-12B, S-12C, S-12D, G-69, S-175, S-18C, S-197, S-332, S-333, and S-334. There are two internal structures controlling flow (S-346 and S-347), which control flow in Buttonwood Canal. There are three project structures, which are located in the basin but are not currently operated; the S-12E, S-12F, and S-14. The S-12A, S-12B, S-12C, and S-12D are identical gated spillways located in the L-29 between L-28 and L-67. They connect WCA-3A to the Everglades National Park Basin. The first connection between WCA-3A and the south Miami-Dade canals occurred in 1978 with the completion of structures S-333 and S-334 in the L-29 Canal. These structures were installed to provide additional dry season water deliveries to L-31N. Structure G-69 connects WCA-3B to the Everglades National Park Basin via the L-29 Canal. Project works are largely peripheral to the Everglades National Park Basin and have as their primary function providing a supply of water to the basin.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - FLORIDA BAY

Both the Modified Water Deliveries to Everglades National Park and C-111 projects are assumed to be completed in the future without plan condition. The first project to be implemented is the C-111 Project. Notably, the C-111 spoil (dredged material) mounds in the marsh on the southern leg of the C-111 Canal were removed in 1997. The purpose of this project was to promote overland flow out of the canal into the marshes in the northeastern part of Florida Bay. In addition, two other features of the C-111 Project are scheduled to be completed in the near future which would beneficially affect water quality in Florida Bay. A new pump station, S-332D, is scheduled to begin operations to deliver increase stages in the L-31W Borrow Canal, preventing seepage from Everglades National Park from draining east into the canal network and downstream to tide. Operation of S-332D is intended to promote overland flow during high water conditions. Also, the existing single-span bridge over Taylor Slough in Everglades National Park is to be replaced with two longer-span bridges and two box culverts. Removing sections of an existing fill road (Ingraham Highway) across Taylor Slough will augment the bridge replacement project.

Furthermore, agricultural nonpoint pollution sources in the C-111 Basin are currently being investigated as required by the non-Everglades Construction Project

(ECP) structure requirements of the Everglades Forever Act and the C-111/Modified Water Deliveries projects implementation process.

FUTURE WITHOUT PLAN CONDITION - PHYSICAL FACILITIES AND OPERATIONS - EMERGENCY INTERIM PLAN

Legislation known as the Emergency Interim Plan for Florida Bay (Chapter 373.4593 Florida Statutes (F.S.)) was passed by the Florida Legislature in May of 1994. Its purpose was to:

> Provide for the release of water into Taylor Slough and Florida Bay by up to 800 cfs, in order to optimize the quantity, timing, distribution, and quality of fresh water, and promote sheetflow into Taylor Slough.

Section 2(e) called for acquisition of the western three sections of the agricultural area known as the Frog Pond in Miami-Dade County. The South Florida Water Management District (SFWMD) took title to all eight sections of the Frog Pond in February of 1995. This effectively became Phase 1 of the Emergency Interim Plan, as the acquisition of this land eliminated land use conflicts between Everglades National Park and farming occurring in the Frog Pond. Elimination of these conflicts prevented the unnatural reduction in canal stages that had previously taken place each year in the fall to facilitate those farming activities. In addition, it allows greater flexibility in implementation of a rainfall driven plan for water levels in L-31W.

Phase 2 of the Emergency Interim Plan was designed to provide additional pumping capability into the L-31W Canal, which formed the western boundary of the Frog Pond. Pump Station S-332D (C-111 Project and Experimental Program of Water Deliveries to Everglades National Park) was built for this need and increased pumpage to 500 cfs.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - FLORIDA BAY

Barnes Sound is the only segment of Florida Bay included on the Florida Department of Environmental Protection (FDEP) 1998 303(d) list. Excessive nutrients, chlorides, and low dissolved oxygen (DO) were identified as constituents of concern in ambient water quality monitoring. Other areas of Florida Bay also experience periodic water quality problems. Salinity is the primary water quality parameter of concern in the bay. Bay waters are periodically hypersaline or too low in salinity, depending upon the frequency of hurricanes and other significant storm events and flood release discharges from Central and Southern Florida Project features. Advective conditions in the bay have also contributed to extensive algal blooms. Water temperature levels are also periodically elevated above prescribed temperature limitations. Seatrout collected from Florida Bay also exhibit elevated mercury levels.

Water quality conditions in northeastern Florida Bay should improve in 2050 compared to existing (1995) conditions. Full implementation of the Biscayne Bay SWIM Plan elements should also benefit water quality conditions in Florida Bay also. When fully completed, it is anticipated that the C-111 Project would improve water quality conditions in the vicinity of Taylor Slough through the implementation of structural and operational modifications necessary to achieve preferred hydrologic conditions. It is expected that the net load of agricultural nonpoint source pollution entering the C-111 Canal and south into Florida Bay will be reduced in 2050 compared to existing conditions. The Modified Water Deliveries to Everglades National Park Project is also expected to result in water quality improvements in Florida Bay through the delivery of increased volumes of fresh water to the bay via Northeast Shark River Slough.

LAND USE - EVERGLADES NATIONAL PARK AND FLORIDA BAY

As the region has grown its land use patterns have dramatically changed. In South Florida the character of the land has acted as one of the constraints dictating early settlement patterns. Topography, soils, and aquifer maps illustrate the vulnerability of South Florida to inundation. On the east coast, the Atlantic Coastal Ridge and associated pine rocklands, due to its higher elevation and more stable soils, were the first to develop. As the coastal ridge developed and available lands were depleted (particularly over the last few decades), other less suitable lands were developed in the sprawl pattern characteristic of current day South Florida.

Agriculture

Little or no agricultural production takes place in these regions, which includes Everglades National Park, Florida Bay, the Ten Thousand Islands, and Whitewater Bay. However, water management decisions made for these regions may affect other regional farmland and should, therefore, be considered carefully.

PHYSICAL CONDITIONS - FLORIDA KEYS

The Florida Keys are a limestone island archipelago extending southwest over 200 miles from the southern tip of the Florida mainland to the Dry Tortugas, 63 miles west of Key West. They are bounded on the north and west by the relatively shallow waters of Biscayne Bay, Barnes and Blackwater sounds, Florida Bay (all areas of extensive mud shoals and seagrass beds) and the Gulf of Mexico. Hawk Channel lies to the south, between the mainland Keys and an extensive reef tract 5 miles offshore. The Straits of Florida lie beyond the reef, separating the Keys from Cuba and the Bahamas.

The Florida Keys are made up of over 1,700 islands encompassing approximately 103 square miles. They are broad, with little relief, have a shoreline length of 1,865 miles, and are inhabited from Soldier Key to Key West. Key Largo and Big Pine Key are the largest islands. The Keys are frequently divided into the following three regions:

1. the Upper Keys (north of Upper Matecumbe Key)
2. the Middle Keys (from Upper Matecumbe Key to the Seven Mile Bridge)
3. the Lower Keys (from Little Duck Key to Key West)

The Florida Keys National Marine Sanctuary encompasses approximately 3,668 square miles of submerged lands and waters between the southern tip of Key Biscayne and the Dry Tortugas Bank. North of Key Largo the sanctuary includes Barnes and Card sounds, and to the east and south the oceanic boundary is the 300-foot isobath. The Florida Keys National Marine Sanctuary also contains part of Florida Bay and the entire Florida Reef Tract, the largest reef system in the continental United States. The Florida Keys National Marine Sanctuary contains components of five distinct physiographic regions: Florida Bay, the Southwest Continental Shelf, the Florida Reef Tract, the Florida Keys, and the Straits of Florida. The regions are environmentally and lithologically unique, and together they form the framework for the sanctuary's diverse terrestrial and aquatic habitats.

EXISTING CONDITIONS - FLORIDA KEYS WATER MANAGEMENT

There is no overall surface water management canal infrastructure in the Florida Keys. The Central and Southern Florida Flood Control Project (C&SF Project) canal system has very little influence on the Florida Keys, except in the estuarine areas of Florida Bay, where it controls the amount and timing of freshwater releases into the estuaries.

FUTURE WITHOUT PLAN CONDITION - WATER QUALITY - FLORIDA KEYS

The major ongoing water quality improvement program in the Florida Keys, which is expected to result in improved water quality conditions in the future, is the Water Quality Protection Program of the Florida Keys National Marine Sanctuary Program. The United States Environmental Protection Agency (USEPA) and the FDEP are jointly responsible for implementing water quality improvement activities throughout the Florida Keys Region as part of the Water Quality Protection Program. Implementation of these activities will result in improved water quality conditions in the Florida Keys in the future.

WATER QUALITY PROBLEMS AND OPPORTUNITIES - FLORIDA KEYS

The Florida Keys as a whole were identified as having use-impaired water quality on the FDEP 1998 303(d) list; however, water quality problems are generally restricted to canals, marina basins, and nearshore waters as opposed to adjacent open waters. The principal pollutants of concern are excessive nutrient loading and fecal coliform bacteria

from inadequate wastewater treatment and disposal facilities, although low DO levels are also common in canals of the Florida Keys.

Due to recently imposed growth management regulations and limitations on expanded urban development, the population of the Keys is not expected to greatly increase by 2050. In addition, the Florida Keys National Marine Sanctuary Plan (National Oceanic and Atmospheric Administration, 1996) contains a Water Quality Protection Program developed by the USEPA (USEPA, 1996) in cooperation with the Administration and the FDEP. The Water Quality Protection Program Document, approved in 1996, contains a set of initial recommendations for corrective actions, monitoring, research, and education/outreach. These recommendations have been included in a Water Quality Action Plan focusing on wastewater, stormwater, marinas and live-aboard vessels, landfills, hazardous materials, mosquito spraying, canals and research and monitoring. If the recommended wstewater and stormwater corrective actions are implemented, water quality conditions in the Florida Keys Region are expected to be improved in 2050 compared to existing conditions.

The USEPA, other federal, state and local agencies and citizen stakeholders have identified wastewater infrastructure as the single most important investment to improve nearshore and canal water quality. The cost of wastewater improvements necessary to improve nearshore and canal water quality in the Florida Keys has been estimated at between $184 to $418 million, depending on the percentage reduction in wastewater nutrient loadings to be achieved and which treatment system or systems are ultimately selected. Improvements of stormwater management in the area of the Florida Keys is also needed. The cost of stormwater management and treatment necessary to reduce pollutant loadings in the Florida Keys is estimated at between $370 to $680 million, depending on the percentage reduction in stormwater pollutant loadings targeted to be achieved and which areas are selected to be retrofitted. Water quality improvements in Florida Keys canals and nearshore areas are expected to result from improved wastewater collection, treatment, and disposal implemented through the Monroe County Wastewater Master Plan and through implementation of the Monroe County Stormwater Master Plan, both of which are major components of the Water Quality Protection Program.

LAND USE - FLORIDA KEYS

In 1975, Florida designated Monroe County an Area of Critical State Concern under the authority of Chapter 380, F.S. This legislation was designed to preserve and protect the county’s unique natural resources, which were being degraded by large development projects. It gave the State Department of Community Affairs (DCA) the responsibility of overseeing all development activities within the designated area. The legislation required both the drafting of a comprehensive plan and development regulations designed to set the county's growth-management standards, over which the state has final review and approval.

Significant features of the plan include the “down-zoning” of large natural areas (excluding Key West, Key Colony Beach, and Layton), and the establishment of the

Monroe County Land Authority, which is responsible for purchasing these down-zoned areas. The plan was also designed to preserve the contiguous areas of habitat as biologically functional units, specifying that required open-space areas may not be altered. It also contained the rudiments of the concept of “concurrency,” which requires that a project cannot be completed without the public infrastructure necessary to support it.

Monroe County and its sister municipalities are currently revising their comprehensive plans under Chapter 163, F.S. In general, Chapter 163 legislates more specific standards, significantly expands the concept of concurrency, and allows the local government to set a "level of service" for hurricane evacuation that cannot be exceeded as a result of new development. However, because the county is an Area of Critical State Concern, the county must still meet the standards of Chapter 380, F.S.

Existing Land Use

The inhabited Keys make up only five percent of Monroe County's total land area (65,500 of 1.2 million acres). The county also contains over 99,000 acres of the Everglades, but this area is almost entirely within Everglades National Park and Big Cypress National Preserve (BCNP). The majority of the county, consequently, is classified as "conservation land."

Within the county, the unincorporated area is distinguished from the four incorporated areas of Key West, Key Colony Beach, Layton, and Islamorada. Within the unincorporated area, land use is also apportioned differently between the Upper, Middle, and Lower Keys. The types of land use can be defined as residential, commercial, industrial, or public facilities and buildings; historical buildings and districts; military facilities; and recreation, conservation, and vacant land.

Residential Land

The portion of land used for residential purposes ranges from 12 percent in the Lower Keys to 58 percent in Key Colony Beach. The small percentage of residential use in the Lower Keys is due to the high proportion of conservation land, primarily in the National Key Deer Refuge. The relatively high proportion of residential development in Key Colony Beach reflects the city's reliance on Marathon for commercial and other use categories. Within the unincorporated area, the majority of residential development (78 percent) consists of single- family units. The unincorporated area also has the majority of the county's mobile homes, although the total area is relatively small. The cities of Key West and Key Colony Beach have substantial duplex development. In the city of Key West, the single-family/duplex zoning category accounts for 62 percent of all residential area. Key Colony Beach has similar percentages.

Commercial Land

The proportion of commercial land in each area is similar, although there are significant differences between the Upper, Middle, and Lower Keys. In general,

commercially zoned land accounts for about four percent of land-use acreage within the Keys. The Middle Keys contain significantly higher proportions because of the large amount of commercial land in Marathon. The lower levels in the Lower Keys reflect the large amount of refuge conservation land.

Industrial Land

The cities of Key West, Key Colony Beach, and Layton contain no significant industrial development, and rely on the adjacent unincorporated areas for their industrial needs. Two industries, rock mining and marine repair and salvage define industrial use in the Keys. The majority of rock mining operations are in Stock Island and Marathon. Other small-scale industrial businesses are located in Stock Island, Big Pine Key, Marathon, and Key Largo.

Public Facilities and Buildings

As much as eight percent of Key West is allocated to public buildings and facilities (excluding recreational uses), while the unincorporated area, Key Colony Beach, and Layton provide one percent or less.

Historic Buildings and Districts

Within the cities of Key Colony Beach and Layton, and in the unincorporated areas of the Keys, virtually no acreage is allocated for historical lands. There are, however, historic structures and buildings outside Key West, including those on Pigeon Key and the Carysfort Light off North Key Largo, both of which are listed, in the National Register of Historic Places. The city of Key West also considers large areas of "old town" historic and, as a result, requires additional permits before allowing development. In addition, the city has established a Historic Architectural Review Commission to ensure that the traditional character and appearance of the area is maintained.

Military Facilities

Military facilities are located exclusively in Key West and the Lower Keys. About 25 percent of Key West’s land is used for military purposes. In the Lower Keys there are three military facilities that make up five percent of all land in the unincorporated area.

Recreational Facilities

The city of Key West provides about seven percent of its land area for recreational purposes, while the Lower and Upper Keys provide less than two percent each. The Middle Keys provide 11 percent, Key Colony Beach nine percent, and Layton none. These numbers may be somewhat misleading, however, as they are derived primarily from a list of publicly and privately owned lands that provide recreational activities. Many private

owners of resort areas provide recreational facilities geared toward water activities that include swimming pools and/or tennis courts.

Conservation Land

Conservation land makes up about 34 percent of all unincorporated land use within the Keys. The largest proportion is in the Lower Keys, and is associated with the National Key Deer and Great White Heron refuges (28 percent). In the Upper Keys (51 percent), conservation land is located primarily in North Key Largo. The cities of Layton and Key Colony Beach have no conservation land. Within the city of Key West, conservation land is undeveloped and categorized as open water, freshwater islands, tidal wetlands, mangrove, and hammock. Some of the land is in private ownership and, therefore, could be subject to future development. However, substantial areas around the “Salt Ponds” area of Key West have been (and are currently being) acquired by the Monroe County Land Authority. A total of 550 acres remains undeveloped in Key West.

Vacant Land

About 210,000 acres of land are potentially available for development, representing just over 34 percent of the Keys' total land area. In the unincorporated area of the county, vacant land is the largest land-use category. Ten percent of the county's vacant land is divided into nearly 15,000 vacant lots. These lots represent the only reasonably buildable property remaining in the Keys, and make up a substantial proportion of the total potential single-family development area.

Florida Reef Tract

The Florida Reef Tract is an arcuate band of living coral reefs paralleling the Keys. The reefs are located on a narrow shelf that drops off into the Straits of Florida. The shelf slopes seaward at a 0.06 degree angle into Hawk Channel, which is several miles wide and averages 50 feet deep. From Hawk Channel, the shelf slopes upward to a shallower area containing numerous patch reefs. The outer edge is marked by a series of bank reefs and sand banks that are subject to open tidal exchange with the Atlantic Ocean. The warm, clear, naturally low-nutrient waters in this region are conducive to reef development.

ELIGIBLE COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

31 - Florida Keys Tidal Restoration Project (OPE)

This project includes the use of bridges or culverts to restore the tidal connection between Florida Bay and the Atlantic Ocean in Monroe County. The four locations are as follows: 1) Tarpon Creek, just south of Mile Marker 54 on Fat Deer Key (width 150 feet); 2) unnamed creek between Fat Deer Key and Long Point Key, south of Mile Marker 56 (width 450 feet); 3) tidal connection adjacent to Little Crawl Key (width 300 feet); and 4)

tidal connection between Florida Bay and Atlantic Ocean at Mile Marker 57 (width 2,400 feet).

The purpose of this project is to restore the tidal connection that was eliminated in the early 1900's during the construction of Flagler's railroad. Restoring the circulation to areas of surface water that have been impeded and stagnant for decades will significantly improve water quality, benthic floral and faunal communities, larval distribution of both recreational and commercial species (i.e., spiney lobster), and the overall hydrology of Florida Bay.

REFERENCES

Florida House of Representatives, Committee on Environmental Protection, Final Analysis of Bill #CS/CS/SB 908, Chapter Law #99-247, Laws of Florida, July 26, 1999.

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Appendix A:
WMD FLORIDA FOREVER GOALS AND PERFORMANCE MEASURES

Effect of Proposed Changes:

Section 1. Section 259.105(4), F.S., is amended to provide new goals and performance measures for the Florida Forever programs of the DEP and WMDs. They include:

(Goal) (a) Enhance the coordination and completion of land acquisition projects, as measured by:

1. The number of acres acquired through the state's land acquisition programs that contribute to the completion of Florida Preservation 2000 projects or projects begun before Preservation 2000;
2. The number of acres protected through the use of alternatives to fee simple acquisition; or
3. The number of shared acquisition projects among Florida Forever funding partners and partners with other funding sources, including local governments and the federal government.

(Goal) (b) Increase the protection of Florida's biodiversity at the species, natural community, and landscape levels, as measured by:

1. The number of acres acquired of significant strategic habitat conservation areas;
2. The number of acres acquired of highest priority conservation areas for Florida's rarest species;
3. The number of acres acquired of significant landscapes, landscape linkages, and conservation corridors, giving priority to completing linkages.
4. The number of acres acquired of under-represented native ecosystems;
5. The number of landscape-sized protection areas of at least 50,000 acres that exhibit a mosaic of predominantly intact or restorable natural communities established through new acquisition projects, or augmentations to previous projects; or
6. The percentage increase in the number of occurrences of endangered species, threatened species, or species of special concern on publicly managed conservation areas.

(Goal) (c) Protect, restore, and maintain the quality and natural functions of land, water, and wetland systems of the state, as measured by:

1. The number of acres of publicly-owned land identified as needing restoration, acres under going restoration, and acres with restoration activities completed;
2. The percentage of water segments that fully meet, partially meet, or do not meet their designated uses as reported in the Department of Environmental Protection's State Water Quality Assessment 305(b) Report;
3. The percentage completion of targeted capital improvements in surface water improvement and management plans created under s. 373.453(2), F.S., regional or master stormwater management system plans, or other adopted restoration plans;
4. The number of acres acquired that protect natural floodplain functions;
5. The number of acres acquired that protect surface waters of the state;
6. The number of acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired;
7. The number of acres acquired that protect fragile coastal resources;
8. The number of acres of functional wetland systems protected.

9. The percentage of miles of critically eroding beaches contiguous with public lands that are restored or protected from further erosion;
10. The percentage of public lakes and rivers in which invasive, non-native aquatic plants are under maintenance control; or
11. The number of acres of public conservation lands in which upland invasive, exotic plans are under maintenance control.

(Goal) (d) Ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

1. The number of acres acquired which provide retention and storage of surface water in naturally occurring storage areas, such as lakes and wetlands, consistent with the maintenance of water resources or water supplies and consistent with district water supply plans;
2. The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; or
3. The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

(Goal) (e) Increase natural resource-based public recreational and educational opportunities, as measured by:

1. The number of acres acquired that are available for natural resource-based public recreation or education;
2. The miles of trails that are available for public recreation, giving priority to those that provide significant connections including those that will assist in completing the Florida National Scenic Trail; or
3. The number of new resource-based recreation facilities, by type, made available on public land.

(Goal) (f) Preserve significant archaeological or historic sites, as measured by:

1. The increase in the number of and percentage of historic and archaeological properties listed in the Florida Master Site File or National Register of Historic Places which are protected or preserved for public use; or
2. The increase in the number and percentage of historic and archaeological properties that are in state ownership.

(Goal) (g) Increase the amount of forestland available for sustainable management of natural resources, as measured by:

1. The number of acres acquired that are available for sustainable forest management;
2. The number of acres of state owned forestland managed for economic return in accordance with current best management practices;
3. The number of acres of forestland acquired that will serve to maintain natural groundwater recharge functions; or
4. The percentage and number of acres identified for restoration actually restored by reforestation.

(Goal) (h) Increase the amount of open space available in urban areas, as measured by:

1. The percentage of local governments that participate in land acquisition programs and acquire open space in urban cores; or
2. The percentage and number of acres of purchases of open space within urban service areas.

Appendix B:
CURRENT COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS

CURRENT COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS - LAKE OKEECHOBEE REGION

Taylor Creek/Nubbin Slough Storage and Treatment Area Project

This separable element includes an aboveground reservoir with a total storage capacity of approximately 50,000 acre-feet and a stormwater treatment area with a capacity of approximately 20,000 acre-feet in the Taylor Creek/Nubbin Slough Basin. The initial design of this separable element assumed a reservoir of 5,000 acres with water levels fluctuating up to 10 feet above grade and a stormwater treatment facility of approximately 5,000 acres. The final size, depth and configuration of this separable element will be determined through more detailed planning, land suitability analysis and design.

The purpose of this separable element is to attenuate flows to Lake Okeechobee and reduce the amount of nutrients flowing to the lake. The separable element is designed to capture, store, and treat basin runoff during periods when levels in Lake Okeechobee are high or increasing. The water quality treatment element of this separable element is consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team and the Pollution Load Reduction Goals for Lake Okeechobee developed for the Lake Okeechobee Surface Water Improvement and Management Plan (SFWMD, 1997f). The water held in the reservoir would be released to Lake Okeechobee when lake levels decline to ecologically acceptable levels.

The project description for the Taylor Creek/Nubbin Slough Storage and Treatment Area is located at: http://www.evergladesplan.org/pm/program/pmp5.shtml, under the Lake Okeechobee Watershed Project. This information is also included on the CD-ROM (tcmain.pdf and tcapp.pdf).

Goals and Performance Measures

Goals and related performance measures for the Taylor Creek/Nubbin Slough Storage and Treatment Area Project (a component of the Comprehensive Everglades Restoration Program) may include the following:

Goal (a)3.

Goal (a) Enhance the coordination and completion of land acquisition projects, as measured by:

3. The number of shared acquisition projects among Florida Forever funding partners and partners with other funding sources, including local governments and the federal government

The Taylor Creek/Nubbin Slough Storage and Treatment Area Project will be cost shared on a 50/50 basis with the United States Army Corps of Engineers (USACE).

The Comprehensive Everglades Restoration Program (CERP) is being implemented in a 50/50 partnership between the South Florida Water Mangement District and the USACE. Cost sharing for individual projects within CERP will vary. For the Taylor Creek/Nubbin Slough Storage and Treatment Area Project, the South Florida Water Management District is acquiring the lands. USACE will provide funding and/or inkind services for their share of the planning, design, and construction of the project.

Goal (c)5.

Goal (c) Protect, restore, and maintain the quality and natural function of land, water, and wetland systems of the state, as measured by:

5. The number of acres acquired that protect surface waters of the state

The Taylor Creek/Nubbin Slough Storage and Treatment Area Project will require the acquisition of an estimated 10,000 acres of land for water storage and phosphorus reduction. Approximately 4,785 acres have been acquired.

The purposes of the Taylor Creek/Nubbin Slough Project are to store excess floodwater runoff and to reduce phosphorus loading to Lake Okeechobee. Storing floodwater runoff during wet periods will help reduce the frequency and duration of high water levels in Lake Okeechobee that harm the lake's natural resources and result in damaging discharges to the estuaries. Reducing the phosphorus load to Lake Okeechobee from the Taylor Creek/Nubbin Slough Basin will provide an important component of a comprehensive program to meet the Total Maximum Daily Load requirements for Lake Okeechobee.

CURRENT COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS - CALOOSHATCHEE RIVER/ SOUTHWEST FLORIDA REGION

C-43 Basin Storage Reservoir

Description of the Water Body, Water Usage, and Hydrology

The C-43 Basin Storage Reservoir is a feature of the Comprehensive Everglades Restoration Plan which includes above-ground reservoir(s) with a total storage capacity of approximately 160,000 acre-feet located in the C-43 Basin in Hendry, Glades, or Lee counties. The initial design of the reservoir(s) assumes 20,000 acres with water levels fluctuating up to 8 feet above grade. At this time, 9,000 acres have been acquired for use in the project. The final size, depth, and configuration of this facility will be determined through more detailed planning and design.

The Caloosahatchee River once had an undistinguishable connection to Lake Okeechobee and probably received overflow from the lake only in abnormally wet years. The river was shallow and had numerous oxbows. Flooding along the river was common. A viable connection to the lake was made in the early 1900's and Lake Okeechobee experienced its first major drainage and lowering of its water levels. As flood control was developed in the river basin, high flows to the estuaries were increased while low flows to the estuary diminished. The magnitude of the flood flows from the local basin easily exceeds the magnitude of the regulatory releases from Lake Okeechobee. However, regulatory releases from the lake increase flows to the estuary and become a part of the salinity-balance problem. The need for dry-season water supply increased with agricultural development in the basin. The diminished low flows of the basin, coupled with the increase in the agricultural water supply demand causes the basin to be highly dependent on water supply releases from Lake Okeechobee in dry seasons.

The primary goals of storage in the Caloosahatchee Basin are to reduce peak flood flows to the estuary; capture excess runoff and help meet dry-season water demand; and provide for minimum flows to the estuary.

Agency Juristictions

The USACE, SFWMD, and the FDEP are the federal and state agencies that have jurisdiction over the reservoir and its facilities. Once the final configuration of this facility is determined through detailed planning and design, local jurisdiction will be determined.

Land Use

The predominant land use within the project area's drainage basin is agriculture, with citrus and sugarcane being the dominant crops. The major drainage canals within the project area's drainage basin are the Townsend Canal, the Roberts Canal, and the Header Canal. Each of these canals and the Caloosahatchee River will provide flows to the project

upon completion. Agricultural and residential discharge activities are permitted within the project's drainage basin.

Management Strategies for Restoration and Protection of the Water Body

The purpose of the reservoir is to capture C-43 Basin runoff and releases from Lake Okeechobee. The facilities will be designed for water supply benefits, some flood attenuation, to provide environmental water supply deliveries to the Caloosahatchee Estuary, and water quality benefits to reduce salinity and nutrient impacts of runoff to the estuary. It is assumed that, depending upon the size of the facility and pollutant loading conditions in the watershed, the facility could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets.

Studies

This project was initially included in the Lower East Coast Regional Water Supply Plan and has been subsequently been included in the Comprehensive Everglades Restoration Plan, the Caloosahatchee Water Management Plan, and the Southwest Florida Water Management Plan.

Maintainence of the Water Body after Restoration

A maintenance and operation plan will be developed during the detailed planning and design phase of the project that will address the management and maintenance of the water resource development project.

Project Schedule

The draft schedule for the implementation of C-43 Basin Storage Reservoir is as follows:

- Project Management Plan Development - March 12, 2001 – September 30, 2001
- Project Implementation Report - December 1, 2001 – March 5, 2004
- Real Estate Acquisition - March 8, 2004 – February 2, 2007
- Detailed Design - March 8, 2004 – March 3, 2006
- Plans and Specifications - March 6, 2006 – March 2, 2007
- Construction - March 5, 2007 – August 27, 2010

Funding Needed

Preliminary estimates for the project total $201,234,000 (1999 dollars) for planning, design, construction, land acquisition and project management.

Goals and Performance Measures

Goals and related performance measures for the C-43 Basin Storage Reservoir may include the following:

Goal (c) 5, 6, & 7.

Goal (c) Protect, restore, and maintain the quality and natural function of land, water, and wetland systems of the state, as measured by:

5. The number of acres acquired that protect surface waters of the state

6. The number of acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired

7. The number of acres acquired that protect fragile coastal resources

The C-43 Basin Storage Reservoir identifies 20,000 acres of land for acquisition to protect surface waters of the state, to minimize damage from flooding, and to protect fragile coastal resources. Of the 20,000 acres, approximately 9,000 acres have been acquired to date (10/01).

Goal (d) 3.

Goal (d) Ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

3. The numner of acres acquired of ground water recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply

The C-43 Basin Storage Reservoir identifies 20,000 acres of land for acquisition to provide groundwater recharge for water supply. Of the 20,000 acres, approximately 9,000 acres have been acquired to date (10/1/01).

The improvement of environmental water supply in the Caloosahatchee River (C-43) is the main benefit realized from the C-43 Basin Storage Reservoir. The extreme highs and lows of freshwater discharges into the Caloosahatchee Estuary will be attenuated, minimizing the negative impacts to the estuarine environment. The C-43 Basin Storage Reservoir will capture stormwater runoff from the basin and when necessary will release flows to the estuary at rates compatible with maintaining or promoting the health of the Caloosahatchee Estuary.

In addition, water supply benefits will occur by providing dry season flows to assist in meeting environmental and urban water supply demands. Reduction of impacts due to saltwater intrusion may also occur.

Permitting and Regulatory Issues Related to the Project

During the development of the Comprehensive Everglades Restoration Plan (Restudy) and its associated Programmatic Environmental Impact Statement the entire program, including this project, were evaluated for compliance with the following regulations:

- National Environmental Policy Act of 1969, Final PEIS included in Appendix N of the Restudy
- Fish and Wildlife Coordination Act of 1958, Final Fish and Wildlife Coordination Act Report by United States Fish and Wildlife Service and Final Fish and Wildlife Coordination Act Reports (Part II and Part III) by the Florida Game and Freshwater Fish Commission (FGFWFC) are included in Annex A of the Restudy
- Endangered Species Act of 1973, programmatic biological opinion from United States Fish and Wildlife Service is contained in Annex B of the Restudy and states that the project (CERP) is in full compliance with the Act
- National Historic Preservation Act of 1966, the Restudy is in partial compliance, cultural resource investigations are ongoing to determine effects to historic properties on a program level
- Clean Water Act (CWA) of 1972, the Restudy is in partial compliance and will obtain full compliance upon the issuance of a Section 401 permit from the state of Florida (See Section 404(b) Evaluation in Annex C of the Restudy)
- Clean Air Act of 1972, the Restudy will be in full compliance upon receipt of comments on the Final PEIS from the United States Environmental Protection Agency (USEPA)
- Coastal Zone Management Act of 1972, the Restudy is in partial compliance and will achieve full compliance upon receipt of comments from the Florida State Clearinghouse (A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in the Restudy, Annex D)
- Wild and Scenic River Act of 1968, not applicable to the Caloosahatchee River
- Estuary Protection Act of 1968, the Restudy is in full compliance
- Resource Conservation and Recovery Act of 1976, not applicable to the Restudy
- Toxic Substances Control Act of 1976, not applicable to the Restudy

- Marine Protection, Research, and Sanctuaries Act of 1972, not applicable to the Restudy
- Rivers and Harbors Appropriation Act of 1899, the Restudy is in full compliance
- Coastal Barrier Resources Act, not applicable to the Restudy
- Section 904 of the 1986 Water Resources Development Act, the Restudy is in full compliance
- Section 307 of the 1990 Water Resources Development Act, the Restudy is in full compliance
- E.O. 11988, Floodplain Management, the Restudy is in full compliance
- E.O. 11990, Protection of Wetlands, the Restudy is in full compliance
- E.O. 12114, Environmental Effects Abroad of Major Federal Actions, not applicable to the Restudy

This project will require further evaluation during detailed planning and design to determine compliance with the following regulations:

- Farmland Protection Policy Act of 1981, the detailed design will provide information that will aid in the determination of the acres of unique farmland that will be affected by this project
- Federal Water Project Recreation Act of 1965, recreation planning will be preformed during the detailed project engineering and design
- E.O. 12898, Environmental Justice, further analysis of community impacts will be undertaken when more specific site information is obtained during detailed planning and design
- An analysis will be performed during the detailed planning and design of the project to identify the state of Florida Consumptive Use, Surface Water Drainage, and construction permits required for the project

Public Access for Project Lands

During the detailed planning and design phase of the project, an evaluation will be performed that will identify potential public access and recreational activities.

Acquisition for Project Lands

The final land requirements for this project will be established during the early stages of the detailed design phase. Further geotechnical investigations must be performed to make a determination. The SFWMD has obtained 9,000 acres of citrus grove property

via full fee simple interest. Due to the nature of the project any additional property requirements will have to be met in the same manner. All lands referenced above will assist in recharging of ground water.

CURRENT COMPREHENSIVE EVERGLADES RESTORATION PLAN (CERP) PROJECTS - LOWER EAST COAST REGION

Western C-11 Diversion Impoundment and Canal (Cell 11)

Description of the Water Body, Water Usage, and Hydrology

The Western C-11 Diversion Impoundment and Canal (C-11 Impoundment) is a feature of the Comprehensive Everglades Restoration Plan which includes an impoundment with a total storage capacity of 6,400 acre-feet. The initial design of the impoundment assumed 1,600 acres with the water level fluctuating up to 4 feet above grade. At this time, approximately 530 acres have been acquired for the project. The final size, depth and configuration of the feature will be determined through more detailed planning and design.

Historically, this area was once part of the Everglades ecosystem. The construction of the east coast protective levees by 1960 severed this connection. Further drainage improvements, including those done as part of the Indian Trace Improvement District, have supported the area's development to unimproved and improved pasture. Currently, flood protection for the C-11 West Basin is provided by the C-11 Canal and the S-9 Pump Station located at the intersection of the L-37 and L-33 protective levees. This pump station returns levee seepage to Water Conservation Areas (WCA) 3A and 3B that enters the C-11 West Canal through seepage into the L-37 and L-33 borrow canals and stormwater runoff.

Agency Juristictions

The following units have jurisdiction over the proposed project site: city of Weston, Indian Trace Improvement District, Broward County, the SFWMD, the FDEP, and the USACE.

Land Use

The project area is characterized by various land uses, which include unimproved and improved pasture with livestock currently being grazed on a portion of the site. There are existing wetlands and wetland mitigation areas on-site. Invasion by exotic plant species has been noted in the area. There are also existing residential units located within the project area.

Management Strategies for Restoration and Protection of the Water Body

The purpose of the proposed project is to divert and treat excess stormwater runoff from the western C-11 Canal Basin that is presently backpumped into WCA-3A, control seepage from WCA-3 by improving ground water elevations and provide flood protection for the western C-11 Basin. After diversion and treatment in the stormwater treatment area/impoundment, water is available to be sent to the C-9 Stormwater Treatment Area/

Impoundment or the North Lake Belt Storage Area. Water quality in WCA-3 is expected to improve once stormwater runoff is no longer being backpumped. The project provides improved water supply, improved saltwater intrusion protection, and possibly additional flows to Biscayne Bay.

Studies

The C-11 Impoundment has been included in the following studies: Comprehensive Everglades Restoration Project (2000), Lower East Coast Water Supply Plan (2000) and the Water Preserve Areas Feasibility Study (tentative 2002).

Maintanence of the Water Body after Restoration

A maintenance and operation plan will be developed during the detailed planning and design phase of the project and will address the management and maintenance of the water resource development project.

Operation and maintenance may include but is not limited to regular mowing of levee surfaces; control structure maintenance, equipment replacement and overhaul; pump station maintenance, replacement and overhaul; structural maintenance and repair; canal maintenance including removal of floating and submerged vegetation; and shoreline spraying.

Project Schedule

The schedule for the implementation of C-11 Impoundment (Appendix M of the Central and Southern Florida Project Comprehensive Review Study) is as follows:

- Real Estate Acquisition October 1, 2001 – September 26, 2003
- Detailed Design October 1, 2001 – September 26, 2003
- Plans and Specifications September 29, 2003 – September 24, 2004
- Construction September 27, 2004 – September 19, 2008
- Preliminary estimates for the project total $124,837,000 in 1999 dollars

Funding Needed

The total estimated conceptual cost in 1999 dollars to complete the Western C-11 Diversion Impoundment and Canal is $124,837,000. This includes an estimated real estate acquisition cost of $85,126,000. The projected sources of funding are estimated as follows: 50 percent federal government and 50 percent SFWMD and local sponsors. The 50 percent share attributed to the SFWMD may include local cost share partners as yet to be identified.

Goals and Performance Measures

Goals and related performance measures for the C-11 Impoundment may include the following:

Goal (c) 6.

Goal (c) Protect, restore, and maintain the quality and natural function of land, water, and wetland systems of the state, as measured by:

6. The number of acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired

The C-11 Impoundment identifies 1,728 acres of land for acquisition to minimize damage from flooding. Of the 1,728 acres, approximately 850 acres have been acquired to date (10/4/01).

Goal (d)3.

Goal (d) Ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

3. The numner of acres acquired of ground water recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply

The C-11 Impoundment identifies 1,728 acres of land for acquisition to provide groundwater recharge for water supply. Of the 1,728 acres, approximately 850 acres have been acquired to date (10/4/01).

The improvement of water quality in the WCA-3A is the main benefit realized from the C-11 Impoundment. The poor quality runoff from the western C-11 Canal Basin is no longer backpumped into the WCA-3A via the S-9 Pump Station. It is diverted into the C-11 Impoundment where it then becomes available for diversion to the C-9 Impoundment, the North Lake Belt Storage Area after it is operational or WCA-3A after treatment, as applicable. In addition, the C-11 Impoundment helps control seepage from WCA-3A and WCA-3B by increasing ground water elevations directly east of the East Coast Protective Levee.

Incidental ground water recharge is provided by operating the S-9 Seepage Divide Structure, S-381 critical project, to maintain the western C-11 Canal stage. Seepage control is provided by the C-11 Impoundment by reducing seepage losses from the WCA-3A by storing water in the impoundment. Incidental water supply benefits are provided by providing dry season flows to assist in meeting environmental and urban water supply demands. Incidental reduction of impacts due to saltwater intrusion may also occur.

Permitting and Regulatory Issues Related to the Project

During the development of the Comprehensive Everglades Restoration Plan (Restudy) and its associated Programmatic Environmental Impact Statement the entire program, including this project, were evaluated for compliance with the following regulations:

- National Environmental Policy Act of 1969, Final PEIS included in Appendix N of the Restudy
- Fish and Wildlife Coordination Act of 1958, Final Fish and Wildlife Coordination Act Report by the United States Fish and Wildlife Service and Final Fish and Wildlife Coordination Act Reports (Part II and Part III) by the FGFWFC are included in Annex A of the Restudy
- Endangered Species Act of 1973, programmatic biological opinion from United States Fish and Wildlife Service is contained in Annex B of the Restudy and states that the project (CERP) is in full compliance with the Act
- National Historic Preservation Act of 1966, the Restudy is in partial compliance, cultural resource investigations are ongoing to determine effects to historic properties on a program level
- Clean Water Act of 1972, the Restudy is in partial compliance and will obtain full compliance upon the issuance of a Section 401 permit from the state of Florida (See Section 404(b) Evaluation in Annex C of the Restudy)
- Clean Air Act of 1972, the Restudy will be in full compliance upon receipt of comments on the Final PEIS from the United States Environmental Protection Agency (USEPA)
- Coastal Zone Management Act of 1972, the Restudy is in partial compliance and will achieve full compliance upon receipt of comments from the Florida State Clearinghouse (A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in the Restudy, Annex D)
- Wild and Scenic River Act of 1968, not applicable to the Caloosahatchee River
- Estuary Protection Act of 1968, the Restudy is in full compliance
- Resource Conservation and Recovery Act of 1976, not applicable to the Restudy
- Toxic Substances Control Act of 1976, not applicable to the Restudy
- Marine Protection, Research, and Sanctuaries Act of 1972, not applicable to the Restudy

- Rivers and Harbors Appropriation Act of 1899, the Restudy is in full compliance
- Coastal Barrier Resources Act, not applicable to the Restudy
- Section 904 of the 1986 Water Resources Development Act, the Restudy is in full compliance
- Section 307 of the 1990 Water Resources Development Act, the Restudy is in full compliance
- E.O. 11988, Floodplain Management, the Restudy is in full compliance
- E.O. 11990, Protection of Wetlands, the Restudy is in full compliance
- E.O. 12114, Environmental Effects Abroad of Major Federal Actions, not applicable to the Restudy

This project will require further evaluation during detailed planning and design to determine compliance with the following regulations:

- Federal Water Project Recreation Act of 1965, recreation planning will be preformed during the detailed project engineering and design
- E.O. 12898, Environmental Justice, further analysis of community impacts will be undertaken when more specific site information is obtained during detailed planning and design
- An analysis will be performed during the detailed planning and design of the project to identify the state of Florida Consumptive Use, Surface Water Drainage, Everglades Stormwater, NPDES, dredge and fill and construction permits required for the project

Public Access for Project Lands

During the detailed planning and design phase of the project, an evaluation will be performed that will identify potential public access and recreational activities. They may include fishing, boating, nature watching, and picnicking.

Areas where recreational activities may occur are as follows:

- Fishing may be available in excavated areas that are created inside the impoundments to provide borrow material and meet control structure requirements. These excavated areas become permanent pools of water that may provide sufficient means for fish to endure the impoundments' extended dry-periods.
- Boating is a possibility when storm events provide enough runoff for the impoundment to fill.

- Limited sized boat ramps may be provided for access for boating and fishing activities.
- Public access to the C-11 Impoundment levees will be provided to the extent that public safety is assured. Recreational opportunities afforded to the public by access to levees range from fishing to nature watching and photography.
- Limited parking for the public will be provided at boat ramp sites. In addition, picnicking and other recreational opportunities may be provided at the boat ramp sites.
- External peripheral canals surround the impoundment for the purpose of seepage collection. These canals may have an additional littoral zone for fish and wildlife habitat. Public usage of these areas for further recreational opportunities is encouraged. Local roads and developments provide a large number of access points. Recreational opportunities are generally high for these areas and include all of the following: fresh water fishing, picnicking, nature watching, nature education, and photography.
- Historically, water control structures are located near public roads. This provides public access along the canals for limited recreational opportunities. These opportunities often include fishing, picnicking, and nature watching. These access points will remain open to the extent that public safety is assured.

Acquisition for Project Lands

The final land requirement for this project will be established during the early stages of the detailed design phase. Approximately 1,900 acres of land are needed for the C-11 Impoundment which is located northeast of the intersection of US Highway 27 and C-11 Canal in Broward County. Its footprint is contained within the Cell 11 footprint. The impoundment extends south from approximately the middle of Sections 14 and 15 within the Cell 11 footprint to the C-11 Canal and east of US Highway 27.

All lands referenced above will assist in recharging of ground water.

CURRENT WATER BODY RESTORATION PROJECTS - KISSIMMEE RIVER REGION

The Kissimmee River Restoration Project

The Kissimmee River Basin covers about 3,000 square miles of south-central Florida. In the 1960's the Kissimmee River was channelized as part of the comprehensive C&SF flood control project. The 103 miles meandering Kissimmee River was channelized into a 56 miles, 250 feet wide canal (C-38). The C-38 project worked as designed for flood control. However, the C-38 project also drained over 14,000 acres of wetlands and severely eliminated wading birds, waterfouls and fisheries within the River Basin. The purpose of the Kissimmee River Restoration Project is restoration of the ecosystem that was affected by construction of the flood control project in the Lower Kissimmee River Basin and restoration of the Upper Basin. The restoration project will provide the necessary flows for the restoration of the Kissimmee River ecosystem and maintenance of the existing level of flood control within the basin, while backfilling the middle portion (22 miles) of the C-38 Canal, and will re-create the river's physical form and flows.

The restoration program has involved years of extensive work by the USACE and the SFWMD, as well as continuing participation by a variety of interests in Florida and throughout the nation.

In 1992 the Water Resources Development Act (WRDA), congress jointly authorized the ecosystem restoration of the Kissimmee River and the Kissimmee River Headwaters Revitalization Project. The cost-sharing requirements applicable to this project were established as 50 percent federal and 50 percent nonfederal. On March 22, 1994, a Project Cooperation Agreement was executed between the Department of the Army and the SFWMD, which combined the two authorized construction segments into one project, the Kissimmee River, Florida Project.

The Kissimmee River Project consists of both structural and nonstructural modifications within the upper Basin. Acquisition of approximately 85,000 acres of land is required to provide the necessary storage requirements for Kissimmee River restoration and reestablishment of the floodplain.

The cost of the entire project has been estimated to be approximately $500,000,000.

Description of Water Body

The River's name "Kissimmee" is derived from a Calusa Indian word that means "long water". The Kissimmee River Basin is located in south-central Florida between the city of Orlando and Lake Okeechobee and covers an area of approximately 3,013 square miles (**Figure B-1**). The watershed, which is the largest source of surface water to Lake Okeechobee, is about 105 miles long and has a maximum width of 35 miles. Lake

Okeechobee is the major source of fresh water to the residents of South Florida (**Figure B-2**).

The Kissimmee River Project area covers Orange, Osceola, Polk, Highlands, and Okeechobee counties. The Kissimmee River Basin is divided into two parts:

1. The Upper Basin, which covers 1,633 square miles includes Lake Kissimmee and the East and West chain of lakes areas in Orange and Osceola counties.
2. The Lower Basin covers 758 square miles, which includes the tributary watershed of the Kissimmee River between the outlet in Lake Kissimmee and Lake Okeechobee.

Water Use in the Kissimmee Basin

Water use is divided into urban and agriculture (**Table B-1**). Agriculture is the largest existing and largest projected water user within the basin.

Table B-1. Kissimmee Basin Water Demands.

Land Use	1995	2020	Percent Change
Urban	35,602	68,153	76
Agricultural	112,668	173,995	54
Total Water Demand	148,270	242,148	63

Hydrology

The Kissimmee River Restoration Project will provide flows to the restored Kissimmee River approaching the duration and variability of discharges which occurred before the river was channelized. Minimum flows are expected to exceed 250 cubic feet per second (cfs) about 95 percent of the time, compared to the current flows which are less than 30 cfs 50 percent of the time. Maximum velocities for the restored channel will be between 0.8 and 1.8 feet per second during bankfull stage. The stage recession rate should rarely exceed one foot per month. Overbank flooding will occur within the restored area when discharges exceed 1,400 - 2,000 cfs. Average floodplain velocities will be on the order of 0.2 to 0.4 feet per second.

Based on historic stage-duration hydrologic data and expected future flows from Lake Kissimmee, overbank flooding of the river valley in a typical year will start in July or August, and reach a peak from September through November and gradually recede from December through June. Very wet or dry years and storm events will vary this pattern.

Figure B-1. Kissimmee Location Map.

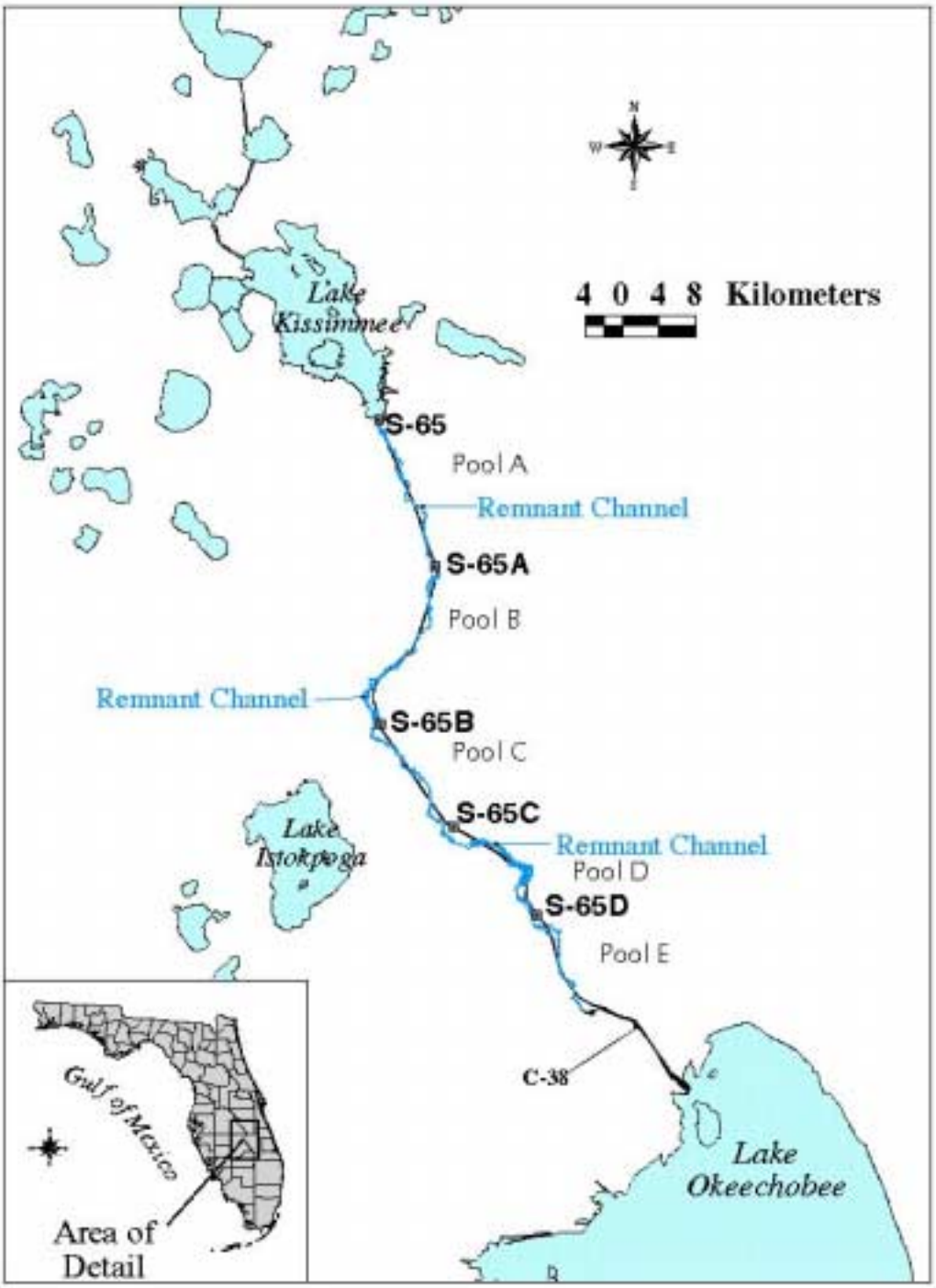


Figure B-2. Kissimmee River System.

Historic Conditions

Historically, the Kissimmee River meandered approximately 103 miles within a 1 to 2 mile wide floodplain. The floodplain, approximately 56 miles long, sloped gradually to the south from an elevation of about 51 feet at Lake Kissimmee to about 15 feet at Lake Okeechobee.

Under historic conditions, river flows generally exceeded 250 cfs 95 percent of the time. The river moved very slowly, with normal river velocities averaging less than two feet per second. Wetland, wildlife, waterfowl, fisheries, and other biological components were once part of an integrated and resilient river floodplain ecosystem that provided and estimated 340,000 habitat units. A fluctuating hydroperiod, along with the ondulating topography of the floodplain, a meandering river channel, oxbows, and natural discontinuous levees, enhanced and maintained habitat diversity, including a mosaic of intermixed vegetation and other complex physical, chemical, and biological interactions and processes.

Early flooding conditions in the Kissimmee River Basin were the result of runoff accumulation on the flat lands of the basin and the subsequent rise of lake levels within the Upper Basin, which remained at high levels because of poor outlet capacity.

The drought of 1944-1945 and a major hurricane in 1947, which caused extensive flooding in the Kissimmee Basin, illustrated the inadequacy of the basin's water control system. In 1948, Congress authorized the USACE to undertake construction of the C&SF Project for flood control and other purposes. Work within the Lower Basin, which was initiated in 1962 and completed in 1971, included channelization of the Kissimmee River.

The C-38 Canal provided complete channelization of the river between Lakes Kissimmee and Okeechobee, a linear distance of 56 miles. Construction of the C-38 Canal reduced the threat of floods in the Lower Kissimmee River Basin, enabling more intensive land uses to occur. However, it also led to a number of environmental impacts, such as a loss of fish and wildlife habitat, a reduction in the nutrient assimilative capacity of the river's floodplain, and loss of aesthetic qualities inherent in a natural meandering river system.

Over 35,000 acres of wetlands that existed prior to channelization are estimated to have declined to about 14,000 acres today.

A major concern following completion of the Kissimmee River channelization was decreased water quality due to low dissolved oxygen (DO) conditions that are the main effects of channelization.

Restoration Efforts

In 1992, the Water Resources Development Act (WRDA) and Congress jointly authorized the ecosystem restoration of the Kissimmee River Restoration Project. The cost-sharing requirements applicable to this project were established as 50 percent federal

and 50 percent nonfederal. On March 22, 1994, a Project Cooperation Agreement was executed between the Department of the Army and the SFWMD, which combined the two authorized construction segments into one project, the Kissimmee River, Florida Project. The major components of the restoration project include the following:

1. Reestablishment of inflows from Lake Kissimmee that will be similar to historical discharge characteristic
2. Acquisition of approximately 85,000 acres of land in the lower Kissimmee Chain of Lakes and river valley
3. Continuous backfilling of 22 miles of canal
4. Removal of two water control structures
5. Recarving of 9 miles of former river channel

Restoration Project Status

Planning, engineering, design and construction have been initiated. A test backfilling project was initiated in 1994 and completed in September 1994. The restoration project is divided into the following five restoration elements:

1. The Restoration Evaluation Program
2. Projects Needed to Implement the Revised Headwaters Regulation Schedule
3. Phase I Backfilling Projects
4. Phase II Backfilling Projects
5. Phase IV Backfilling Projects

The Phase I Backfilling was completed in February 2001. The restoration project is underway and expected to continue until 2011. The Restoration Evaluation Program is designed to evaluate the success of the project in meeting the established restoration goals, to provide for continuous, scientifically informed fine-tuning of the construction and adaptive management of the recovering and restored ecosystem.

Agency Jurisdictions

Federal Jurisdiction on the Kissimmee River Basin involves the regulatory responsibilities of the USACE, the United States Environmental Protection Agency (USEPA), and the United States Fish and Wildlife Service (USFWS). The USACE is responsible for prescribing the operational criteria and the regulation schedules for the C&SF Project. Their primary regulatory functions include operation and maintenance of the levees and major outlet works, dredge and fill activities, maintaining navigable waters, cleanup of pollution spills and the protection of endangered species.

The USEPA is responsible for protection of the environmental resources of the Kissimmee River Basin.

State agencies involved with the management and regulation of the Kissimmee River Basin are primarily, the Florida Department of Environmental Protection (FDEP) and FGFWFC. Their jurisdictions include the protection of water quality, wetland resources, fisheries and wildlife resources.

At the regional level, the SFWMD and three regional planning councils have jurisdiction within the Kissimmee River Basin planning area. The SFWMD's authority is to manage and protect the water resources in a 16-county region. Regional Planning Council jurisdictions are assigned by county. The Southwest Florida Regional Planning Council has jurisdiction within Glades and Hendry counties. The Central Florida Regional Planning Council has jurisdiction within Okeechobee and Highland counties. The East Central Florida Regional Planning Council has jurisdiction within Polk and Osceola counties. Regional Planning Councils have responsibilities to develop regional comprehensive policy plans for protection of water resources within the planning area and provide technical assistance to local governments and evaluate the impacts anticipated from development of regional on regional resources.

The local governments listed below have the authority to control land use in the Kissimmee River Basin through their comprehensive plans and land development regulations. Sectors that exist at the local government level include planning, building, zoning and regulatory departments, water and sewer utilities, city and police departments, and soil, water and conservation districts.

Local counties in the Kissimmee River Basin include: Highlands, Okeechobee, Osceola, Polk, and Orange.

Land Use in the Kissimmee River Basin

The existing land use in the Kissimmee Basin planning area is generally more urban in the north than in the south, as shown in **Table B-2**. Continued urbanization is anticipated in the north, while in the south, agricultural acreage is projected to increase.

Point and Nonpoint Sources of Pollution in the Watershed

Point sources of pollution are defined as discharges to surface and ground waters where discrete measures of water flow and water quality may be taken. In the Kissimmee River Basin planning area, domestic wastewater treatment and Industrial waste facility discharges are considered point sources, as shown in **Table B-3**. Domestic wastewater and industrial waste facilities in the planning area are regulated by the FDEP.

Nonpoint source pollution is usually associated with land use activities that do not have a single discrete discharge point. These pollution sources are usually delineated into rural and urban. Rural nonpoint sources include storm water runoff and are associated with agricultural activities. Urban nonpoint sources are also primarily conveyed by storm water and contain pollutants associated with urban land use.

Table B-2. Acreage and Percentage of Land Use by County Area.

Land Use	Orange	Osceola	Polk	Highlands	Okeechobee	Glades	Kissimmee Basin
Agriculture	31,513 (17%)	218,656 (35%)	44,243 (16%)	259,362 (53%)	189,625 (52%)	139,470 (47%)	882,869 (40%)
Urban	60,243 (32%)	52,212 (8%)	51,449 (19%)	42,194 (9%)	21,928 (6%)	2,760 (1%)	230,788 (10%)
Wetlands	36,338 (20%)	164,355 (27%)	59,571 (22%)	76,821 (16%)	66,800 (18%)	59,678 (20%)	463,563 (21%)
Forest	30,264 (16%)	74,857 (12%)	65,136 (24%)	41,586 (9%)	32,591 (9%)	68,578 (23%)	313,012 (14%)
Rangeland	2005 (1%)	26,012 (4%)	25,270 (9%)	33,489 (7%)	48,284 (13%)	20,223 (7%)	155,283 (7%)
Barren	3,419 (2%)	2,842 (1%)	1,420 (1%)	3,733 (0%)	3,588 (1%)	2,471 (1%)	17,473 (1%)
Water	21,796 (12%)	81,082 (13%)	23,885 (9%)	30,022 (6%)	4,299 (1%)	1,492 (1%)	162,576 (7%)
Total	185,578 (100%)	620,016 (100%)	270,974 (100%)	487,207 (100%)	367,115 (100%)	294,672 (100%)	2,225,562 (100%)

Table B-3. Permits in the Kissimmee River Basin.

Permit Type	Permit Agency	Total Sources	Permit Activity
Point Sources			
Industrial Wastewater	FDEP	95	Industrial Treatment Systems
Domestic Wastewater	FDEP	130	Private and Municipal Wastewater Facilities
Petroleum Contaminate Sites	FDEP	841	Gas Stations and Storage Tanks
Nonpoint Sources			
Dairies	FDEP	15	Dairy Farms BMPs
Works of the District Permits	SFWMD	442	Agricultural, Industrial, Commercial, NPS BMPs
Surface Water Management Permits	SFWMD	2,183	Storm Water Management Systems
Waste Disposal Sites	FDEP	47	Landfills

Management Strategies for Restoration and Protection of the Water Body to Class III or Better Surface Water Quality Status

Most of the watershed is classified as Class III (fishable, swimmable) waters and several waterbodies within the watershed are designated Outstanding Florida Waters by the state of Florida.

Water management planning efforts in the Kissimmee Basin Planning area include a variety of interrelated studies and activities, in both the public and private sectors. Each

plan or study addresses unique water management issues while maintaining close relationships with water supply planning, as shown in **Table B-4**. The related efforts with the most significant influence on the implementation of the Kissimmee Basin Water Supply Plan include the establishment of Minimum Flows and Levels (MFLs) to several lakes in the Kissimmee Basin. Another ongoing effort that will help to preserve the water body is the establishment of Total Maximum Daily Loads on the river and several lakes in the Kissimmee Basin.

Table B-4. Kissimmee Basin Related Water Management Planning Efforts.

Study	Scope/Primary Goal	Relationship to KB Water Supply Plan	Timeframes
KB Water Supply Plan	Adequate and reliable water supply	N/A	2000
Kissimmee River Restoration Project	Environmental restoration of Kissimmee River floodplain, improved surface water quality.	Changing deliveries to Lake Okeechobee	2015
Lake Okeechobee SWIM Plan	Protection and enhancement of Lake Okeechobee and its watershed (water quality)	Discharge water quality and nutrient loading from the Kissimmee River	Update completed 1997, Next update 2001
Lake Okeechobee Regulation Schedule Environmental Impact Study	Evaluates environmental and economic impacts associated with proposed Lake Okeechobee Regulation Schedules (quantity)	Discharge quantity from the Kissimmee River	1999
C&SF Project Restudy	Comprehensive review of environmental Impacts of C&SF Project	Lake Okeechobee storage and treatment, including reservoirs and aquifer storage and recovery	1995-1999
Kissimmee Basin Minimum Flows and Levels (MFLs)	Prevent significant harm to the water resources and ecology of surface water resources in the Kissimmee Basin	MFLs will more clearly define the quantity of water available for consumptive uses. Recovery or prevention strategy has potential to alter future water management activities, including use of water resources in the Kissimmee Basin	2004-2006
Kissimmee Basin Total Maximum Daily Loads (TMDLs)	Prevent significant harm to the water quality and ecology of surface water resources in the Kissimmee Basin	TMDLs will set the maximum pollutants loads that the water body can take to achieve water quality standards	2005-2011

Restoration Studies on the Water Body

Degradation of the Kissimmee River's ecosystem, wetlands and water quality due to channelization in the lower Kissimmee River Valley has been the subject of numerous federal, state and local studies over the past thirty years.

Local involvement in environmental restoration of the Kissimmee River began in the early 1970's. After several years of public debate, the Florida Legislature, in 1976, passed the Kissimmee River Restoration Act. Since 1984, the SFWMD has been the lead agency for the state of Florida in promoting the Kissimmee River Restoration initiative.

Nonfederal Studies

In 1984-1985, a demonstration project was constructed by SFWMD. The results of the $1.4 million project indicated that restored flow would revitalize abandoned river channels. Former wetlands, which had been converted to pasture, would quickly revert to wetland ecosystems with the reestablishment of an appropriate water pattern.

In October 1988, the SFWMD conducted the Kissimmee River Restoration Symposium, where the state's Kissimmee River Environmental Restoration goals were formulated. The symposium ecological review panel concurred with participating scientist that reestablishment of lost ecological values would be achieved only with a holistic, ecosystem restoration perspective.

In a report dated June 1990, the SFWMD proposed a plan to restore the ecological integrity of the Kissimmee River using an ecosystem approach. This plan was called the SFWMD's Alternative Plan Evaluation and Preliminary Design Report. The objective of the plan was to achieve environmental restoration goals while meeting flood control, navigation, water supply, and water quality needs. The restoration goal was to reestablish an ecosystem capable of supporting and maintaining species diversity, distribution, and quantity representative of the natural habitat of the river basin. The report establishes system hydrology and floodplain hydraulics as key factors in environmental restoration. Four basic alternatives were considered in the report: Weiring, plugging, and Level I and Level II backfilling. Only the Level II Backfilling Plan was adequate as meeting the minimum restoration criteria, by restoring 24,000 acres of floodplain and 52 miles of river channel, resulting in a restored 35 square miles of river/floodplain ecosystem. The Level II Backfilling Plan was SFWMD's recommended restoration alternative for the Kissimmee River.

Federal Studies

In response to resolutions by the Committee on Public Works and Transportation of the United States House of Representatives, and the Committee on Environment and Public Works of the United States Senate (dated April 25, 1978), the USACE studied alternative plans for restoration of the Kissimmee River. The study report was submitted to the Assistant Secretary of The Army for Civil Work in 1985. The study concluded that although project modifications responsive to environmental concerns could be constructed, none provided positive net contributions to the nation's economic development. Accordingly, the Chief of Engineers recommended that no federal action be undertaken and that report information be used by nonfederal interests in determining long-range solutions to water and related land resource problems in the basin.

Under authority of Section 1135 of the Water Resources Development Act of 1986, the Jacksonville District Engineer initiated feasibility studies of the plan for revitalization of the Upper Kissimmee Basin. The study was later called the Headwaters Revitalization Project and would consist of changes in lake operation schedules, channel enlargements, modification of existing water control structures, and as a result of higher lake water levels, acquisition of 18,500 acres of land by the local sponsor, SFWMD.

A second federal feasibility study, which was authorized in the Water Resources Development Act of 1990, was also assembled by the USACE. The feasibility study was also an Environmental Impact Statement (EIS). The congressional authority directed that the study be based on implementing the SFWMD's Level II Backfilling Plan. Therefore there was no need to develop new planning objectives or alternative plans.

As a result of these and other studies, two restoration plans were developed which, when implemented together will restore environmental values throughout the Kissimmee River Basin. The two components are the Upper Basin Headwaters Revitalization and the Lower Basin restoration of the Kissimmee River.

Maintenance of the Water Body after Restoration

A basic premise of the Kissimmee River Restoration Project is to reestablish the natural hydrologic processes that shaped and maintained the ecological integrity of the historical river and floodplain ecosystem. The reestablishment of historical hydrologic characteristics is expected to drive the restoration process, and ensure the return and preservation of the system's environmental values. Thus, the restored ecosystem is expected to be largely self-managing by natural hydrologic processes. However, there are at least two potential management concerns for the restored system, invasive/exotic vegetation and public use. Although existing invasive and exotic plant species in the Kissimmee River system, including water lettuce, water hyacinth, and Brazilian pepper are expected to be largely eliminated or at least controlled by the reestablishment of historical discharge characteristics and hydroperiods, some minor control efforts will likely be needed. Of greater concern is the Old World climbing fern (*Lygodium microphyllum*) which is a recent invader of the system and seems capable of persisting in the restored system. Efforts to eradicate or control this species are underway and may be critical for achievement of restoration. The other potential management issue relates to the use/exploitation of the restored system and associated resources. The need for management of public use, such as airboating and hunting pressure will be based on information derived from the projects ongoing ecological evaluation program.

Project Schedule

Kissimmee River Restoration efforts began in 1991 with specific project tasks in the Upper Basin and Phase I portions of the project. In 1993, the Scientific Restoration Evaluation Program began and is scheduled to continue for four years past the completion of the final construction project. Actual construction of features are anticipated to be fully completed by 2010. The major project phases for the Kissimmee River Restoration Project are reflected in **Figure B-3**.

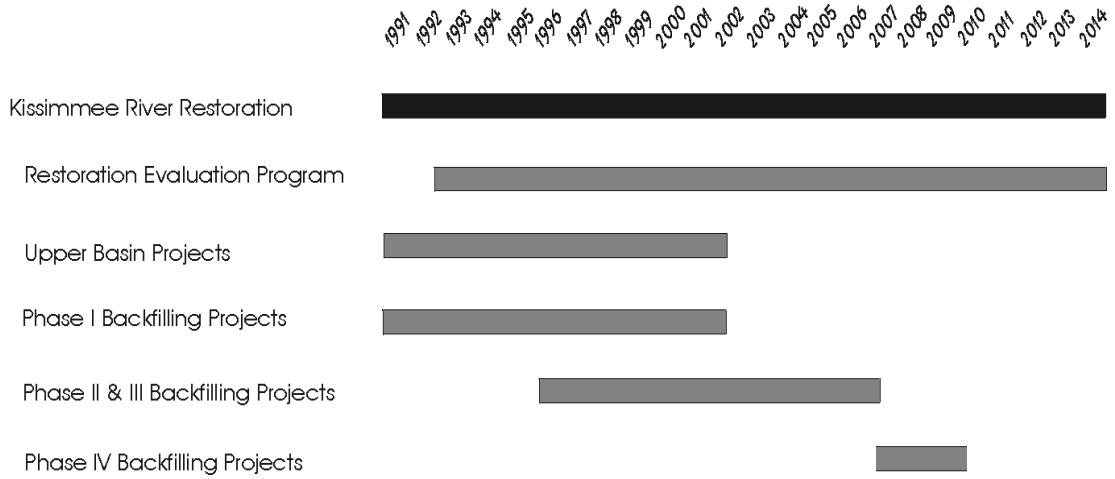


Figure B-3. Kissimmee River Restoration Project Schedule.

Funding Needed

The total project cost for the Kissimmee River Restoration is approximately $500 million. The SFWMD is responsible, per the cost share provisions of the Project Cost Agreement (PCA) between the Department of the Army and the SFWMD (dated March 22, 1994), for 50 percent of the total project cost, approximately $250 million. Through fiscal year 2000, the SFWMD has spent a cumulative total of $96.8 million. This leaves a remainder of approximately $153.2 million of funding needed by the SFWMD to complete the project and fulfill obligations outlined in the PCA.

Figure B-4 depicts the remaining funding that the SFWMD will need to fulfill project obligations directly associated with the Kissimmee River Restoration.

Goals and Performance Measures

Goals and related performance measures for the Kissimmee River Restoration Project may include the following:

Goal (c)1.

Goal (c) Protect, restore, and maintain the quality and natural function of land, water, and wetland systems of the state, as measured by:

1. The number of acres publicly-owned land identified as needing restoration, acres undergoing restoration, and acres with restoration activities completed

The Kissimmee River Restoration Project identifies 96,500 acres of land for acquisition for restoration of the historic Kissimmee River headwaters and floodplain. Of the 96,500 acres, approximately 82,000 acres have been acquired to date (10/1/01).

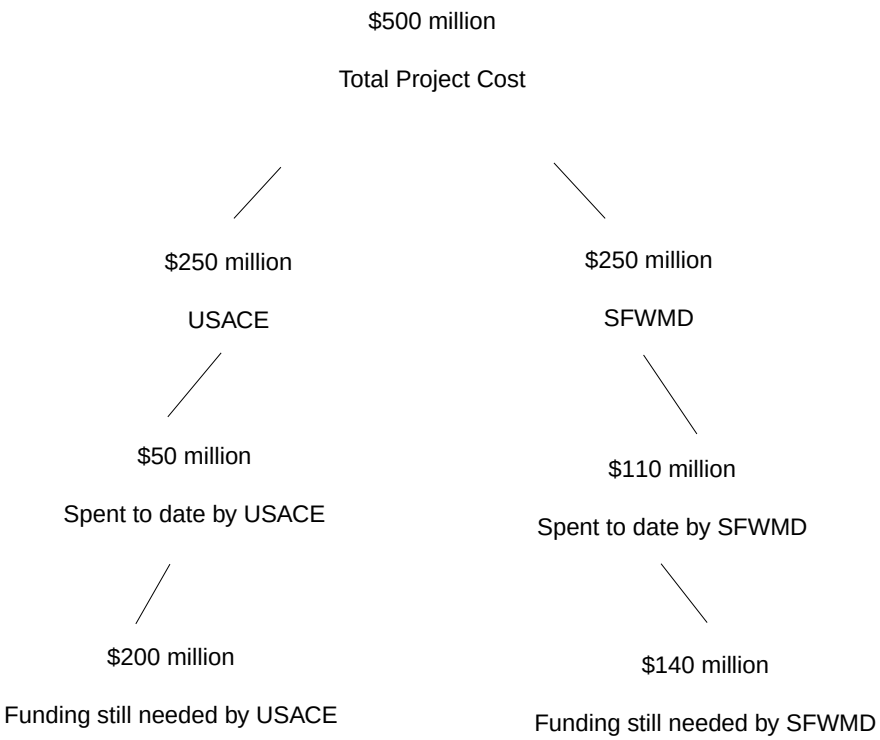


Figure B-4. Kissimmee River Restoration Project Cost Needs.

Goal (c) 4.

Goal (c) Protect, restore, and maintain the quality and natural functions of land, water, and the wetland systems of the state, as measured by:

4. The number of acres acquired that protect natural floodplain functions

The Kissimmee River Restoration Project identifies 96,500 acres of land for acquisition that project natural floodplain functions. Of the 96,500 acres, approximately 82,000 acres have been acquired to date (10/4/01).

Channelization of the Kissimmee River transformed a 103 mile meandering river into a 30 feet deep, 250 feet wide, 56 mile drainage canal (C-38) that is compartmentalized with levees and water control structures into a series of five stagnant pools. Channelization dramatically changed water level and flow characteristics, drained 40,000 acres of floodplain wetlands and severely impacted fish and wildlife populations. The foundation of the Kissimmee River Restoration Project is to restore the ecological integrity of the river-floodplain system by reconstructing the natural river channel and reestablishing hydrologic processes. The restoration project will dechannelize 22 miles of

C-38, remove two water control structures, recarve 9 miles of new river channel, acquire 24,000 acres of historic floodplain and 52 miles of river channel, and implement a new headwaters water release schedule that will fluctuate with seasonal rainfall and reestablish flow regimes that are similar to those of the historic river, resulting in a restored 35 square miles of river/floodplain ecosystem.

Kissimmee River Restoration Project

Baseline Condition. River channelization, drainage and other modifications to wetland plant communities within the floodplain have wide-ranging ecological consequences, including loss of fish and wildlife habitat and virtual destruction of a complex food network that the floodplain wetlands once supported. The 35,000 acres of wetlands that existed prior to channelization are estimated to have declined to about 14,000 acres in today's conditions.

The main goal of the restoration project is restoration of the Kissimmee Basin wetlands and ecosystem.

Headwaters Revitalization Project

Baseline Condition. Hydrologic conditions have been modified in the Upper Kissimmee Basin as a result of the Kissimmee River Flood Control Project. Water levels in Lakes Kissimmee, Cypress and Hatchineha are presently regulated between 48.5 and 52.5 feet NGVD. When required for flood protection of the Upper Basin, water is released to the Lower Basin, sometime, in sudden pulses. A result of the existing narrow regulatory range and little flood or conservation pool storage. regulatory operations often cause rapid changes in water levels in the lakes. No releases to the Lower Basin are made during dry periods. Modifications of the regulation schedules for the Upper Chain of Lakes would provide for greater and more natural fluctuations of water levels in the lakes, as well as the capability to simulate the historic seasonal flow from Lake Kissimmee to the Lower Basin. This capability is a prerequisite for restoration of the Lower Basin ecosystem.

A goal for the Headwaters Revitalization Project is to revise the existing regulation schedule for Lakes Kissimmee, Hatchineha and Cypress. The upper level of the existing schedule would be increased from elevation 52.5 feet to elevation 54.0 feet NGVD. The schedule would be zoned to provide varying discharges based on season and water levels. The revised schedule would seasonally re-flood land between elevations 52.5 and 54.0 feet NGVD in Lakes Kissimmee, Hatchineha, and Cypress. Approximately 17,300 acres bordering the three affected lakes must be acquired.

Kissimmee River Restoration Permitting. Section 401 of the Clean Water Act (CWA) requires that the USACE obtain certification from the state that a proposed water resources project is in compliance with State Water Quality Standards. In Florida, the USACE obtains Water Quality Certification (WQC) by applying for and receiving an Environmental Resource Permit (ERP) issued by the Department of Environmental Protection. The USACE is required by the National Pollution Discharge Elimination

System (NPDES) regulations to obtain a stormwater discharge permit for any construction activity that disturbs five acres or more of land. Activities that are regulated by Section 404 of the CWA do not require permits under the NPDES program. USACE projects that have state WQC are considered to be automatically covered under the NPDES program.

Given the large scale of the Kissimmee River Restoration Project and the extended timeframe for implementation, several WQC permits have and will be required. In 1994, the first permit for the Kissimmee River Restoration Project was issued to the USACE and SFWMD for the test fill project in the C-38 Canal. In July of 1997, the FDEP issued a Noticed General Permit to the SFWMD for the Modified Level II Backfilling Plan, Phase One.

Two of the largest project elements that currently have a WQC from FDEP are the Kissimmee River Headwaters permit, and the Reach 1 (Contract 7) permit. The Headwaters permit covers project features that are located north of S-65. This permit was issued in March 1997 and is periodically modified to include additional project features. The Reach 1 permit, issued in April 1999, covers a section of the C-38 Canal just north of S-65B to just north of S-65C. Most of the construction covered under this permit has been physically completed as of February 2001.

In November of 2000, the USACE obtained a WQC for the C-41A Canal Spillway additions. This permit includes the expansion of the S-68, S-83, and S-84 structures. These features are scheduled for construction in the fall of 2001. The FDEP is expected to issue a WQC for the US Highway 98 culverts in March of 2001. Construction should follow within the year.

The WQC applications for the Istokpoga Canal and CSX Railroad Bridge Project features are scheduled for submission to FDEP by September of 2001. The CSX Railroad Bridge Project also requires a navigation permit from the United States Coast Guard. This permit is obtained concurrently with the FDEP permit. The WQC application process for the Reach 2 Backfill features has not been initiated because no plans and specs have been prepared to date.

Although the USACE has primary responsibility for Kissimmee River Restoration Project permitting, some project features such as the Contract 15 Pool D Residential Area Flood Proofing and the Lykes Brothers Features are being permitted outside of the WQC process. Responsibility for preparing the applications, reviewing them, and issuing permits for these features will be coordinated between the USACE, SFWMD, and FDEP.

Public Access for Kissimmee Project Lands

The Kissimmee River Save Our Rivers (SOR) Project includes lands in the Kissimmee Chain of Lakes and lands along the Kissimmee River. The SOR Project contains the Kissimmee River Restoration Project, which encompasses land in the Upper and Lower basins, and covers an estimated 88,000 acres. This acreage is divided into two major management areas: The Lake Kissimmee Management Area and the Kissimmee River Management Area. Extensive areas within the Chain of Lakes and Kissimmee

River are open for public use. A few isolated tracts are temporarily closed to public use due to cattle leases, however most of the lands are open to a wide variety of public uses, including hiking, hunting, and fishing.

The Lake Kissimmee Management Area comprises 12,902 acres, and consists of the following units:

- Gardner-Cobb Marsh Unit
- Drasdo Unit
- Kissimmee Island Unit
- Lightsey Unit (Tiger Creek and West Short subunits)

Figure B-5 illustrates the Lake Kissimmee Management Area.

The Kissimmee River Management Area consist of Pool C Management Area, Pool D Management Area, Pool E Management Area and Paradise Run Management Area, as shown in **Figure B-6**.

Management assistance in the Kissimmee River Management Areas is provided by the Florida Fish and Wildlife Conservation Commission (FWC), pursuant to agreements with the SFWMD. Public use in areas designated as FWC Management Units is governed primarily by FWC rules. SFWMD Rules are supplemental to FWC rules. Hunting in areas opened for such use is also governed by FWC rules. Special use licenses issued by the SFWMD at no cost, may be required for some activities.

Land Acquisition for Kissimmee River Restoration

The SFWMD has been purchasing lands for the Kissimmee Restoration Project since the mid-1980s. Lands have been purchased in the Kissimmee Chain of Lakes in order to facilitate the implementation of the new regulation schedules in the lakes. Raising the lake regulation schedules will allow the SFWMD to store more water in the lakes, making it available for release to the Kissimmee River. The additional water is necessary in order to provide a year round flow when the river is restored. Lands have been purchased in the lower Basin as a requirement for the restoration of the floodplain and re-establishment of the remnant river segments.

On average, 75 percent of all the lands needed for the Kissimmee Restoration Project are required as a fee title acquisition. That leaves 25 percent of the lands that are required needing temporary, construction or access easements. The USACE set the defining criteria for fee versus easement acquisition at the inception of the project. That criterion is a function of the topographic elevation of the land parcel. Properties measuring at or below the 5-year flood line must be acquired in fee. Properties measuring between the 5 and 100-year flood line can be acquired via a flowage easement. Temporary, construction and access easements are self-explanatory. **Table B-5** shows the pertinent statistics for land acquisition for the Kissimmee Restoration Project.

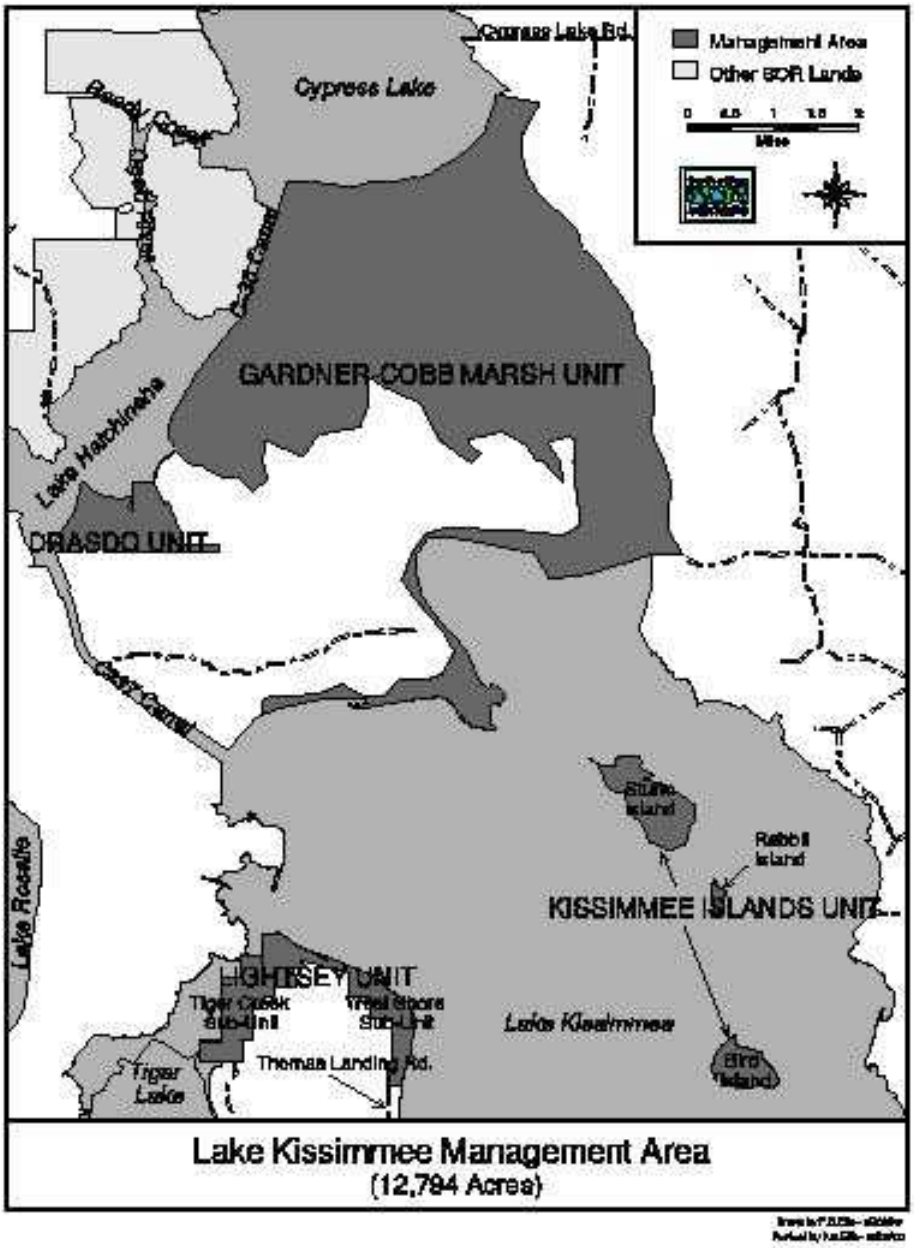


Figure B-5. Lake Kissimmee Management Area.

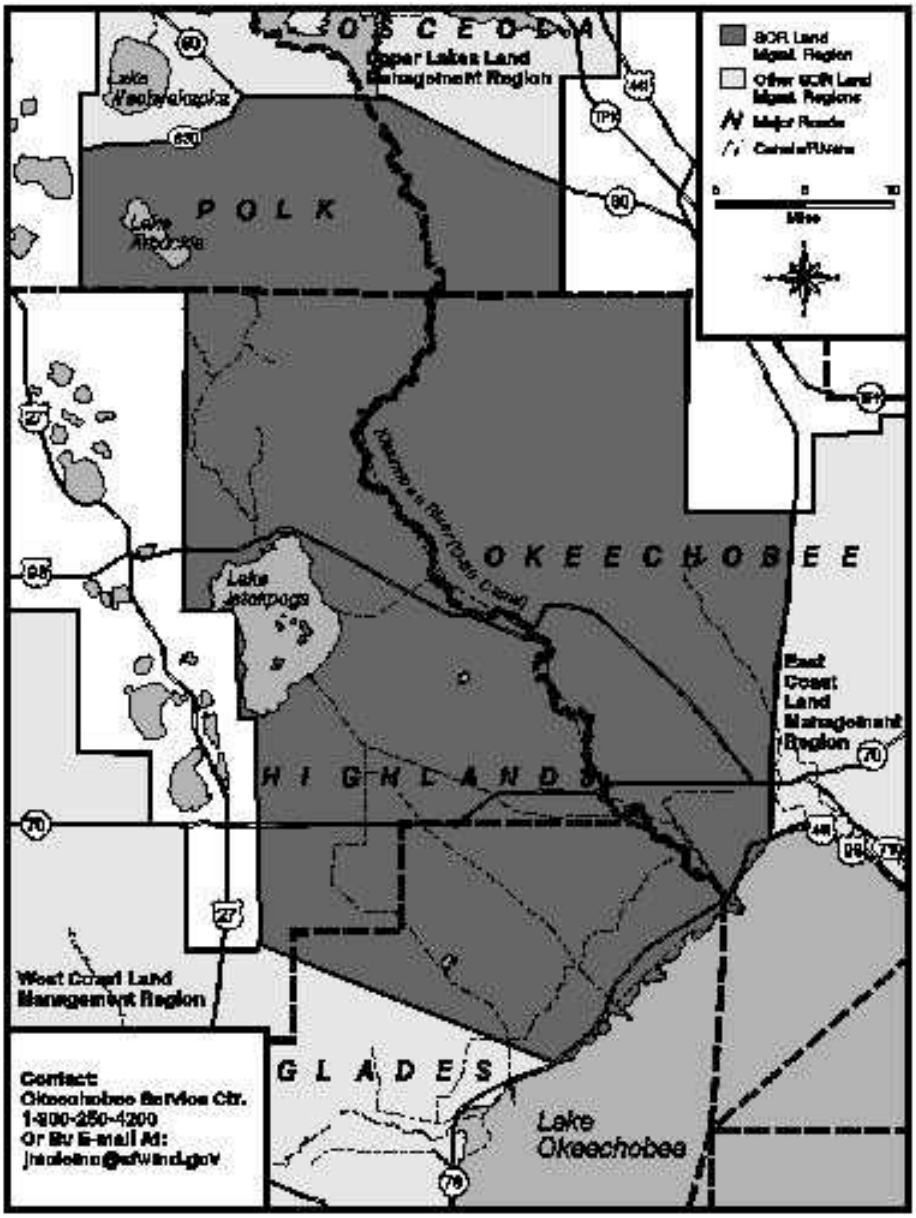


Figure B-6. Kissimmee River Management Area.

Table B-5. Kissimmee River Restoration Real Estate Acquisition Information.

Area	Acreage Needed	Acreage Obtained	Remaining Acreage	Needed in Fee	Needed as Easement
Upper Basin	33,919	27,256	6,663	5,205	1,458
Lower Basin	62,628	54,724	7,904	5,798	2,106
Total	96,547	81,980	14,567	11,003	3,564
Percent of Total	N/A	84.9	15.1	75.5	24.5

There are no lands that have been acquired for the Kissimmee Restoration Project as a function of the need to protect or recharge ground water.

Conclusions

The Kissimmee River Restoration Project is a monumental project in many ways. It is the first attempt at restoring a river ecosystem. It is the culmination of cooperative efforts between many, state, federal and local organizations that have worked together for over three decades to make this project happen. This momentous occasion represents the culmination of more than 25 years of research, design and public activism. The scientific approach towards the comprehensive evaluation of the restoration program sets the Kissimmee River Project apart from all other restoration efforts. Restoration benefits are expected to begin immediately and continue for many generations to come.

Appendix C:
LAND ACQUISITION AND MANAGEMENT

LAND ACQUISITION ACTIVITY REPORT

This section is a summary of South Florida Water Management District (SFWMD) land acquisition activity during the FY2001 Plan Year. The summary details the purchase of lands for various projects and the funding of these land purchases with Water Management Lands Trust Fund (WMLTF), Preservation 2000 (P2000), and Save Our Everglades (SOE) money. In addition, a description of joint acquisition projects using Conservation and Recreation Lands (CARL) funding is provided.

Save Our Rivers (SOR) Program

A total of $492,213 of WMLTF money was use to fund acquisitions in the following projects during the plan year:

- Corkscrew Regional Ecosystem Watershed (CREW) - Acquired 122 parcels, totaling 939 acres for a total purchase price of $3,489,664 of which $235,463 was funded using WMLTF money.
- Kissimmee River Chain of Lakes (KCOL) - Acquired 2 parcels, totaling 23 acres for a total purchase price of $85,750, all of which was funded using WMLTF money.
- Kissimmee River Restoration (KR) - Acquired 6 parcels, totaling 255 acres for a total purchase price of $255,900 of which $140,900 was funded using WMLTF money.
- Model Lands - Acquired 4 parcels, totaling 28 acres for a total purchase price of $28,100 all of which was funded using WMLTF money.
- Water Conservation Areas (WCA) - Acquired 1 parcel, totaling 20 acres for a total purchase price of $2,000 all of which was funded using WMLTF money.

Preservation 2000 Program

A total of $37,965,201 of P2000 money was use to fund acquisitions in the following projects during the plan year:

- L-31N - Acquired 1 parcel, totaling 2.55 acres for a total purchase price of $15,800 all of which was funded using P2000 money.
- 8.5 Square Mile Area - Acquired 10 parcels, totaling 23 acres for a total purchase price of $695,800 of which $435,300 was funded using P2000 money.

- Caloosahatchee Attenuation - Acquired 4 parcels, totaling 9,018 acres for a total purchase price of $70,521,610 of which $37,514,101 was funded using P2000 money. (Berry Groves)

Save Our Everglades (SOE) Program and Other State Funding

A total of $8,378,750 of SOE and other state money was use to fund acquisitions in the following projects during the plan year:

- East Coast Buffer (ECB) - Acquired 64 parcels, totaling 1,519 acres for a total purchase price of $4,602,114 of which $390,000 was funded using SOE money.
- Taylor Creek/Nubbin Slough - Acquired 1 parcel, totaling 4,785 acres for a total purchase price of $10,375,000 of which $7,988,750 was funded using other state money. (Grassy Island Ranch)

Conservation and Recreation Land (CARL) Program

A total of $3,430,600 of CARL money was use to fund acquisitions in the following projects during the plan year:

- Corkscrew Regional Ecosystem Watershed (CREW) - Acquired 122 parcels, totaling 939 acres for a total purchase price of $3,489,664 of which $838,150 was funded using CARL money.
- ECB - Acquired 64 parcels, totaling 1,519 acres for a total purchase price of $4,602,114 of which $2,118,450 was funded using CARL money.
- Indian River Lagoon (IRL) - Acquired 2 parcels, totaling 55 acres for a total purchase price of $948,000 of which $474,000 was funded using CARL money.

The following table provides additional details regarding the land acquisition activity and funding for land purchase in FY2001.

Table C-1. Acquisition Activity Report (Fiscal Year 2001).

Project Names	Parcel	Acres	Price	CARL	District	Federal	State	MIitigation	P-2000	Local Gov't	SOE	WMLTF	Total
L-31N	1	2.55	$15,800						$15,800				$15,800
Corkscrew Reginal Ecosystem Watershed	122	939.03	$3,489,664	$838,150		$1,474,200		$941,851				$235,463	$3,489,664
East Coast Buffer	64	1,519.24	$4,602,114	$2,118,450				$2,093,664			$390,000		$4,602,114
Kissimmee Chain of Lakes (KCOL)	2	23.03	$85,750									$85,750	$85,750
Kissimmee River (KR)	6	254.92	$255,900		$115,000							$140,900	$255,900
Model Lands	4	28.15	$28,100									$28,100	$28,100
8.5 Square Mile Area	10	23.26	$695,800		$260,500				$435,300				$695,800
Calosahatchee Attenuation	4	9,018.08	$70,521,610			$33,007,509			$37,514,101				$70,521,610
Indian River Lagoon	2	54.57	$948,000	$474,000		$379,200				$94,800			$948,000
Lake Okeechobee Water Retention	1	2,135.80	$4,800,000		$4,800,000								$4,800,000
Taylor Creek Nubbin Slough Rasta	1	4,784.93	$10,375,000			$2,386,250	$7,988,750						$10,375,000
Ten Mile Creek	2	184.58	$1,472,366		$1,472,366								$1,472,366
Pal - Mar	4	3.75	$0										$0
Single Creek	4	149.06	$0										$0
Stornwater Treatment Areas (STA)	110	0.00	$1,800			$1,800							$1,800
WCA	1	20.00	$2,000									$2,000	$2,000
Totals	338	19,140.95	$97,293,904	$3,430,600	$6,647,866	$37,248,959	$7,988,750	$3,035,515	$37,965,201	$94,800	$390,000	$492,213	$97,293,904

INTERIM PROPERTY MANAGEMENT AND LAND STEWARDSHIP

This section is a summary of the funding, staffing, and land management activity for every project funded under P2000, Florida Forever, and WMLTF for which the District is responsible.

Table C-2. Funding and Staffing by Project (Fiscal Year 2001).

Project Name	County	Size (ac.)	Acquired (ac.)	Acquisition Partners	Manage. FTEs	Expenditures	
						O&M	Restoration
Land Stewardship Projects							
Atlantic Ridge Ecosystem	Martin	13,122	5,974	CARL	0.1	20,000	
CREW Mitigation Bank	Lee	633	633	None	0.5	102,000	
CREW	Lee/Collier	58,528	23,370	CARL/Lee County	4.6	934,000	460,000
DuPuis	PB/Martin	21,875	21,875	None	5.3	1,076,000	150,000
Indian River Lagoon	Martin/St. Lucie	1,550	598	St. Lucie/CARL/Federal	0.1	20,000	
Kissimmee Chain of Lakes	Polk/Osceola	33,919	27,844	None	2	406,000	
Kissimmee Prairie	Okeechobee	45,631	38,284	CARL	0.2	41,000	
Kissimmee River	Highlands/ Okee/Polk/ Osceola	62,628	52,000	None	4.4	893,000	
Lake Marion Creek	Polk	17,300	10,500	Polk County	2	406,000	
Lake Walk-in-Water	Polk	4,109	4,109	Polk County	0.1	20,000	
Loxahatchee River	PB/Martin	1,936	1,926	None	0.4	81,000	150,000
Loxahatchee Slough	Palm Beach	15,200	1,425	None	0.4	81,000	
Model Lands	Miami-Dade	42,402	4,160	Miami-Dade County	1	203,000	
Nicodemus Slough	Glades	2,219	2,219	None	0.1	20,000	
N. Fork St. Lucie River	St. Lucie	3,800	442	St. Lucie County/CARL	0.2	41,000	
Okaloacoochee Slough	Hendry/Collier	37,210	34,429	CARL/DOF/FWC	0.1	20,000	
Pal-Mar	PB/Martin	36,745	10,307	CARL	0.4	81,000	
Paradise Run	Glades	4,265	1,673	None	0.1	20,000	
Reedy Creek	Osceola	30,000	4,800	None	2	406,000	
Shingle Creek	Orange	7,655	1,500	None	1.8	365,000	
Six Mile Cypress	Lee	1,741	829	Lee County	0.1	20,000	
S. Fork St. Lucie River	Martin	184	184	None	0.1	20,000	
Southern Glades	Miami-Dade	37,620	32,299	None	1	203,000	
Tibet-Butler Preserve	Orange	439	439	None	0.1	20,000	
Water Conservation Areas	PB/Brow/Dade	103,635	51,421	None	0.3	61,000	
Administration/Planning	District-wide	N/A	N/A	N/A	1.8	365,000	
	Totals	584,346	333,240		29.2	5,560,000	760,000
Water Resource Projects							
Caloos. Basin Reserv/Other WC	Hendry	12,500	8,700	Federal, State	0.2	24,424	
East Coast Buffer	PB/Brow/Dade	66,809	20,994	Federal, State, County	*1.4	*203,126	*650,000
Everglades Ag. Area	Palm Beach	51,210	51,210	Federal, State, Private	0.6	73,274	
Frog Pond/L-31N	Miami-Dade	10,450	9,386	Federal, State	1	122,126	
Grassy Island Ranch	Okeechobee	4,785	4,785	Federal	0.2	24,424	
New Palm Dairy	Okeechobee	2,136	2,136	State	0.5	61,063	
Stormwater Treatment Areas	Palm Beach	47,630	45,519	Federal, State	0.6	73,274	
Ten Mile Creek/Other UEC	St. Lucie	1,266	922	None	0.6	73,274	
Wellington/Acme Marsh	Palm Beach	1,050	375	None	0.1	12,213	
Admin/Planning/Other Projects	District-wide	N/A	N/A	N/A	2.2	268,787	
	Totals	197,836	144,027		*7.4	*935,885	*650,000

*Includes 0.4 FTEs, $81,000 in O&M costs, and $650,000 in mitigation dollars administered by the LSD.

Interim Property Management Program

Background

The Interim Property Management Program is responsible for managing those properties acquired by the District for future Comprehensive Everglades Restoration Program (CERP) and other projects until such time as the land is needed for construction. These lands will ultimately be used as stormwater treatment areas, surface water reservoirs, groundwater recharge areas, and/or buffer lands between the Everglades and other sensitive areas and urban development. Typically, these lands are not specifically acquired or designated specifically for environmental enhancement, restoration or preservation purposes, and generally, they are not proposed for recreational or other public uses except on a limited basis that is consistent with their future use.

The Interim Property Management program was initially developed in 1997 to manage the Stormwater Treatment Area (STA), Water Preserve/Management Area (WPA/WMA), and ECB lands during the interim period while acquisition, planning, design, and construction for these projects was taking place. It has since evolved to include other lands acquired by the District for future CERP and other similar construction projects throughout the District. The Land Management Department (LMD) has developed a multi-faceted management approach that:

- protects the natural resource,
- provides on-site management and security for District owned lands at a minimal cost to the District,
- minimizes District expenses by increasing revenue from non-governmental sources to off-set District management, maintenance and resource protection costs,
- generates additional funding for future acquisition,
- minimizes impacts to the local agricultural economy by keeping viable agricultural lands in active production for as long as possible, and
- minimizes fiscal impacts to the local government by keeping lands on the tax roll until they are actually needed for construction.

Where appropriate, historical uses of properties, such as grazing, sod, vegetable, and sugar cane farming, and nurseries and tree farms, are allowed to continue through the use of reservations, leases or similar agreements. Generally, a competitive bid process is used to solicit proposals and award contracts, which include the appropriate cancellation clauses so the land can be quickly made available when it is needed. In some cases, short term leases (5 years or less) are negotiated as part of the acquisition package. Lessees are typically required to actively manage the property, control exotics, provide security for the property, implement applicable best management practices (BMPs), keep the property and

facilities in good repair and condition, obtain all required permits and approvals for their activities, maintain required insurance coverage, pay applicable taxes, etc.

For those lands that are in their natural state and/or where some type of active interim use is inappropriate due to the environmental sensitivity of the land and/or the projected construction timetable for the project for which the land has been acquired, the LMD either manages these lands themselves or contracts with another governmental entity. The LMD conducts regular inspections of all its properties on a semi-annual basis. When it is found to be necessary, LMD will arrange for exotic control, clean up, security or other activities to be conducted.

During FY2001, the Interim Property Management Program was responsible for over 125,000 acres of land, of which approximately 85,817 acres were managed under 67 different leases or management agreements. Most of the leases are with private individuals or companies, but the LMD does have one lease with the Florida Fish and Wildlife Conservation Commission (FWC) and management agreements with three local Soil and Water Conservation Districts (SWCD), pursuant to Chapter 373.1392(1)(d), Florida Statutes (F.S.).

The LMD program is currently staffed by a group of seven professionals with expertise in real estate, engineering, finance, business administration, property management, planning, and regulation. They are responsible for managing these lands through the development of land management plans, implementation and management of leases, regular property inspections, and appropriate follow up activities, including exotic control, fencing, clean up, security, etc. on non-leased lands.

The 2001 budget for LMD was $854,885. This includes personal costs, contractual expenses for activities such as exotic control, cleanup, security, etc., and general administrative costs. Total revenue generated by LMD from leases, sale of products, and other alternative sources for the year was $2,519,406. This was in addition to the $2,145,425 in avoided management costs (calculated at an average cost of $25 per acre) due to the 67 leases and management agreements in place for the 85,817 acres under contract.

Florida Forever Acquisitions

The LMD is responsible for only one piece of property that was acquired this fiscal year with Florida Forever funding. The 10-acre property is located in the city of Weston in western Broward County within the boundaries of the Western C-11 Diversion Impoundment and Canal CERP project in the ECB. Although it is classified as agricultural in the city and county land use plans, the property is undeveloped and covered by natural vegetation. The Broward County Wetlands Map identifies much of this property as jurisdictional wetlands which limits its development potential. Given the projected near term time frames for initiating construction of the C-11 Diversion Impoundment Project and the current condition of the property, the LMD does not have any plans at this time to lease the property for any interim land uses. Management

activities will be limited to routine inspections and security, clean up, and exotic control activities, as needed and appropriate.

Other Interim Land Management Properties

Caloosahatachee Basin Storage Reservoir (Berry Groves)

This project is an active 9,087 acre citrus grove located south of the Caloosahatchee River (C-43 Canal) in Hendry County that was acquired by the District in 2000 using a combination of federal, state, and District money. The acquisition included a leaseback to Berry Groves for seven years that can be extended on an annual basis for an additional five years. It was acquired in response to the need identified in the CERP for 20,000 acres of water storage reservoirs in the Caloosahatchee Basin since it is located downstream of 81 percent of the total basin runoff. LMD responsibilities currently involve monitoring for compliance with lease conditions. An Interim Land Management Plan and Citrus BMP Plan have been prepared for this property.

East Coast Buffer (ECB)

The ECB consists of 66,809 acres of lands located east of the Water Conservation Areas (WCAs) in Palm Beach, Broward and Miami-Dade counties. These lands are being acquired with a combination of District, county, state (CARL, P2000, Special P2000), federal, and private funds. Under CERP, a series of impoundments, including deep water storage reservoirs and shallow marshes, aquifer storage and recovery (ASR) wells, and other improvements to the Central and South Florida Flood Control Project (CSFFCP) will be constructed to capture and biologically treat stormwater runoff from urban areas to the east and release it back to the WCAs. Various CERP projects are scheduled to begin construction starting in 2003 with a completion dates as late as 2023, depending on the project.

Land use and community types vary widely within the ECB and include disturbed Everglades sawgrass marshes and other wetlands invaded by exotic vegetation, converted to pasture, plant and tree nurseries, row crops, and other predominantly agricultural land uses, or in a vacant, undisturbed state. Since so many of the lands are classified as wetland type communities by their respective local governments, which limits their use for agricultural, urban or other land use types, much of the land has remained in its natural state. In addition, due the projected construction start dates for several of the CERP projects, it has not been practicable to consider leasing some of the lands that had historically been farmed in the past.

However, through a combination of reservations at the time of acquisition and a competitive bid process, short term leases have been executed on approximately 3,350 acres in Broward and Palm Beach counties. For the leased lands, interim property management activities have included monitoring for compliance with lease and reservation conditions and routine inspections. For the non-leased lands, interim land management activities have included routine inspections and other activities, such as exotic control, clean up, and fencing, on an as-needed basis. In addition, the Land

Stewardship Division has conducted various mitigation activities, primarily involving exotic control lands within the areas known as the Pennsuco Wetlands in Miami-Dade County and the ECB in Broward County. Interim Land Management Plans have been prepared for many of the parcels, either individually or for all the parcels within a particular cell when the conditions are similar, and are in the process of being prepared for the remainder of the parcels.

Everglades Agricultural Area

The EAA lands include 51,210 acres of land south of Lake Okeechobee that were acquired by the District in 1999 as a result of the Talisman Exchange and Purchase and Sale Agreement, a multi-party agreement executed by the District, United States Department of the Interior (USDOI), Nature Conservancy, Talisman Sugar Corporation, St. Joe Paper Company, United States (U.S.) Sugar, Florida Crystals (and two of its subsidiaries), and Sugar Cane Growers Cooperative of Florida (SCG Coop). The southern portion of these lands falls within the footprint for STA 3/4 and the Water Supply Canal to STA 3/4. Most of these lands will ultimately be used to create two surface water reservoirs to store EAA runoff for re-use for irrigation purposes and to retain stormwater runoff previously lost to tide, which will also minimize impacts to coastal estuaries. Construction of the first and second reservoirs is currently scheduled for 2005 - 2009 and 2010 - 1014, respectively.

U.S. Sugar, Florida Crystals, and the SCG Coop retained farming reservations through 2005 (in certain locations through 2007 and 2015 due to prior agreements with the Trustees of the Internal Improvement Trust Fund [TIITF] and others). LMD responsibilities currently involve monitoring for compliance with the various farm reservation agreements, routine inspections, and permitting coordination on an as needed basis. A draft Interim Land Management Plan has been prepared for the portion of the property outside the STA 3/4 boundaries.

Frog Pond/L-31 North

The Frog Pond and L-31N Transition Lands cover approximately 10,450 acres and are located in southern Miami-Dade County. The L-31 North Transitional Lands, commonly referred to as the Rocky Glades, include 5,250 acres located east of C-111 and L-31N, north of the Frog Pond and south of the 8.5 Square Mile Area. These lands were acquired with a combination of District, state, and federal funds for the C-111 and Modified Water Delivery Projects.

Over the years, through a competitive bid process, the District has executed a number of short term leases with small farmers in the area, totaling approximately 6,515 acres, to continue historical vegetable, nursery, and grove operations in the area. A number of these leases have been terminated, allowed to expire, or not renewed in response to United States Army Corps of Engineers (USACE) requests for certification of certain lands construction of the S-332 structures. LMD responsibilities involve monitoring for compliance with lease conditions, coordination with the federal government on canker eradication activities, and certification of certain lands when

requested by the USACE for components of the C-111 Project. For those lands that are not leased, interim property management responsibilities have included routine inspections, clean up activities, when needed, and certification of certain lands for the C-111 Project. Interim Land Management Plans are in the process of being prepared for these lands.

The Frog Pond includes 5,200 acres of transitional lands located between C-111 on the east and L-31N on the west, south of the Rocky Glades and the 8.5 Square Mile Area. It is managed under a separate management agreement with the South Dade Soil and Water Conservation District who, in turn, is responsible for managing the contracts with the seven different farmers who lease portions of the eastern sections of the property. The SDSWCD has prepared a Land Management Plan for the Frog Pond that includes the western three sections of land that were excluded from the farming leases. LMD responsibilities involve monitoring for compliance with lease conditions.

Grassy Island Ranch

Grassy Island Ranch covers 4,978 acres in central Okeechobee County that were acquired by the District in 2001 with District and federal dollars as part of the Lake Okeechobee Water Retention Area Project. The majority of the property (4,785 acres) continues to be used for pasture by the seller under a farming reservation that expires in 2007. The remaining 193 acres will be used to construct a Phosphorus Removal Stormwater Treatment Area (STA) beginning in 2002. LMD responsibilities for the leased portion of the property involve monitoring for compliance with lease conditions. Interim land management activities on the 193-acre site have included mowing and routine inspections. A groundwater monitoring well network is also being implemented by STA Project Management staff and a Land Management Plan is currently being prepared by LMD that encompasses both parcels of land within the project.

New Palm Dairy

The New Palm/Newcomer Dairy site is a former 2,135.8-acre dairy located adjacent to Nubbin Slough in Okeechobee County that was acquired by the District in 2001 using District and state funds. A short-term reservation was retained by the landowner through November 1, 2001 to close down the existing dairy operation. The Nubbin Slough Stormwater Treatment Area (STA), which is part of the Lake Okeechobee Critical Restoration Project, will be constructed on approximately 1,077 acres in the southern portion of the property beginning in 2002.

Since there is not an immediate project need for the northern portion of the property, the LMD used a competitive bid process to lease the northern portion of the property for grazing purposes. This contract was awarded at the October 2001 Governing Board meeting. In addition, a contract to harvest sable palm trees on the southern portion of the property, prior to the construction of the STA, has been competitively bid. Interim property management responsibilities on the property have included security (gate installations), mowing activities, oversight of an on-site auction of on-site dairy equipment, buildings, and other improvements, demolition/removal of unneeded

buildings, and the preparation of an Interim Land Management Plan for the property. A groundwater monitoring well network is also being implemented on the property by STA Project Management staff.

Stormwater Treatment Areas

The Stormwater Treatment Areas (STAs), mandated by the 1994 Everglades Forever Act, are a series of filter marshes that have been designed to naturally remove nutrients from stormwater runoff flowing from the Everglades Agricultural Area (EAA) before it is discharged to the WCAs or the Everglades Protection Area. To date, STAs 1W, 2, 5 and 6 have been constructed and are operational. Both STA 1E and 3/4 are currently under construction and are both scheduled for completion in 2003.

Interim land management activities on these lands have included the management of several farming leases either in conjunction with the Palm Beach County Soil and Water Conservation District or by the LMD, routine inspections, permitting and water quality monitoring coordination, and several competitive sales of nursery trees. Through coordination efforts by LMD and STA project management staff, lessees have been able to complete the harvesting of crops and/or trees although STA design work and construction activities may already be underway. Interim Land Management Plans have either been prepared or are in the process of being prepared for those lands within the project boundaries, but outside the project footprints, that LMD is still responsible for managing.

Ten Mile Creek

Ten Mile Creek is a 1,266-acre project located in St. Lucie County, just south of Ten Mile Creek and west of the Florida Turnpike, acquired with District funds. The Creek is a major tributary to the North Fork of the St. Lucie River and contributes nearly 25 percent of the river's flow. The Restudy identified this site for construction of a stormwater attentuation reservoir to restore more natural hydroperiods to the St. Lucie Estuary and IRL. Construction is scheduled to begin in mid-2002.

The site presently contains an old citrus grove (728 acres) and some creek floodplain. Since the reservation retained by the former owner (Prudential) expired in 2000, the LMD has used a competitive process to harvest the remaining fruit on the trees and maintain the property. An adjacent 200-acre site that is also part of the project is being managed under a separate agreement with the adjacent landowner. In addition to managing these contracts, other interim land management activities have included routine inspections and mowing. A Draft Interim Land Management Plan has been prepared.

Wellington/Acme Marsh

This project consists of two tracts, totaling approximately 1,050 acres, near STA 1E in Palm Beach County. It was acquired in response to a need identified in the Restudy for 930 acres in the Acme Improvement District Basin B to treat and store 3,800 acre feet of runoff prior to discharge to the Loxahatchee National Wildlife Refuge (WCA 1). Two

reservoirs are proposed, one fluctuating up to 4 feet in depth, the other up to 8 feet deep, with construction scheduled to begin in 2005.

The site includes a 410-acre tract of land adjacent to the STA that is planted in sugar cane and is being farmed under a reservation by the former owner of the property. Interim land management activities involve monitoring for compliance with reservation conditions. An Interim Land Management Plan is in the process of being prepared.

Land Stewardship Projects

Table C-3 describes the District's current list of governing board-approved Save Our Rivers projects. While all are approved projects, no land has been purchased in a number of them. Others are considered "water management" projects and will be incorporated into CERP. Many of these projects are still under agricultural lease and are described under the Land Management Division section. The following project descriptions are limited to those where lands have been purchased for their environmental, as well as water resource, values and are being managed as such.

Atlantic Ridge Ecosystem

Atlantic Ridge is being managed by FDEP, Division of Recreation and Parks, under a joint management lease from SFWMD and the Division of State Lands. The area will be known as Atlantic Ridge Preserve State Park. A management plan is near completion that outlines the goals and objectives for the park. The plan describes hydrologic restoration and staffing needs, plans for exotic control and prescribed burning, and a public use program. It is proposed that initial public use facilities use will include an interpretive kiosk, trailhead and hiking trails, camping, and equestrian trails with an on site stable and paddocks.

Corkscrew Regional Ecosystem Watershed (CREW)

SFWMD and FWC jointly manage CREW. The public use and environmental education program is directed by the CREW Land and Water Trust. The management plan was recently updated and describes plans for exotic control, prescribed burning, upland restoration opportunities, and public use. Property boundaries are posted and FWC Wildlife Officers patrol the property. In FY 2001, a record drought period, approximately 200 acres were burned and 20,000 acres of exotics were treated. Although the District, state and Lee County have acquired more than 23,000 acres, only a narrow strip of Corkscrew Marsh along SR 850 is legally accessible. At that location the CREW Trust and the SFWMD has developed an interpretive hiking trail and constructed an observation platform that overlooks Corkscrew Marsh. An extensive network of tram roads in Bird Rookery Swamp will provide public use opportunities to more than 6,000 acres of CREW if legal access can be obtained. The District anticipates being able to acquire those rights in the near future.

Table C-3. Save Our Rivers Management Status.

Land Management Region	Mgt. Plan Status	Mgt.- Lead (secondary)	Public Access	Recreational/ Educational Opportunities					
				Env. Ed.	Hunt	Eques	Airboat	Camp	Hike
Upper Lakes Region									
Catfish Creek	none	SFWMD	X		X		X	X	X
Lake Kissimmee Management Area		SFWMD	X		X	X	X	X	X
Lake Marion Creek	complete	SFWMD (FWC)	X		X			X	X
Lake Walk-in-Water	in-prep	Polk Co.	X					X	X
Upper Reedy Creek	none	SFWMD	X	X					X
Lower Reedy Creek	in-prep	SFWMD	X		X	X	X	X	X
Shingle Creek	complete	SFWMD	none						
Kissimmee-Okeechobee Region									
Pool A	in-prep	SFWMD (FWC)	X		X	X	X	X	X
Pool B	complete	FDEP	X	X		X		X	X
Pool C	complete	SFWMD (FWC)	X		X	X	X	X	X
Pool D	complete	SFWMD (FWC)	X		X	X	X	X	X
Pool E	none	SFWMD (FWC)	X		X				
Paradise Run	none	SFWMD (FWC)	X		X		X		X
East Coast Region									
Atlantic Ridge	in-prep	FDEP	X					X	X
DuPuis	complete	SFWMD (FWC)	X	X	X	X		X	X
Loxahatchee River	complete	FDEP	X						X
Loxahatchee Slough	none	SFWMD	none						
North Fork St. Lucie R.	in-prep	FDEP	X	X					X
Pal-Mar	in-prep	FWC	X		X	X		X	X
Everglades Region									
Everglades Buffer Strip	none	SFWMD	X						X
Model Lands	none	SFWMD (Dade)	X						X
Southern Glades	complete	FWC (SFWMD)	X		X	X	X	X	X
West Coast Region									
CREW	complete	SFWMD (FWC)	X	X	X			X	X
Nicodemus Slough	complete	Aim Eng., Inc.	X				X		X
Okaloacoochee Slough	in-prep	DOF (FWC)	X		X			X	X
Six Mile Cypress	complete	Lee Co.	X	X					X

DuPuis Reserve

An updated management plan is in preparation and will be completed in FY2002. SFWMD and FWC jointly manage DuPuis. Stewardship activities include prescribed burning, exotic plant control, and a forest management program to reintroduce red-cockaded woodpeckers. In FY2001, approximately 4,160 acres were burned, 9,270 acres were chemically treated for exotic plants, and timber management was conducted on 200 acres. An extensive public use program at DuPuis that attracts thousands of visitors annually includes hunting, fishing, equestrian trails, hiking, and camping. An environmental education facility is near completion at the DuPuis headquarters building that includes indoor displays and an interpretive trail.

Indian River Lagoon (IRL)

Indian River Lagoon is managed by St. Lucie County under a lease from SFWMD and the Division of State Lands. The county recently completed a management plan that addresses hydrologic restoration, exotic control, and public use. Property within the IRL is incorporated into the county's mosquito control program where mosquitoes are controlled by non-chemical means. This method results in greatly improved water quality and wildlife and fisheries habitat in the lagoon. Mosquito impoundment berms are accessible to the public and provide excellent opportunities for fishing, crabbing, and bird watching. The property includes ocean beachfront. Plans are underway to remove exotic Australian pines and provide public beach access.

Kissimmee Prairie Ecosystem

The project is managed by FDEP Division of Recreation and Parks under lease from the District and state and is known as Kissimmee Prairie State Preserve. A state-approved management plan is in place that addresses prescribed burning, exotic control, and public use. SFWMD obtained a federal grant to restore hydrology to a major slough on the property, and Kissimmee River restoration has been completed along the western boundary.

Kissimmee River

The District shares management responsibility with FWC in Pools A, C, D, E, and Paradise Run. Management activities in Pools C & D are interim in nature until river restoration is complete. A management plan for Pools C & D was recently completed. Exotic plant control and prescribed burning take place above the 100-year flood line on all District lands. Below the flood line District-owned marshes along the river are open to airboating and are included in FWC's Kissimmee River Public Use Area, which is open to hunting under FWC regulations. Recently completed river restoration efforts in Pools B & C will provide excellent opportunities for canoeing, fishing, and overnight camping on District-owned lands along the river. The 7,000+ acre Kissimmee Island Cattle Company (KICCO) tract in Pool A is open for equestrian and bicycle use, and contains a well-used stretch of the Florida National Scenic Trail. Logging under a timber management plan is underway on 600+ acres at the north end of KICCO.

Kissimmee Chain of Lakes

A management plan for the Kissimmee Chain of Lakes will be prepared in FY2002. The Kissimmee Chain of Lakes Project Acquisition was designated to provide the capacity to store water and flow water up to the 54-foot National Geodetic Vertical Datum (NGVD) contour line. Public access to most of the land is by boat. Resource management goals for the Chain of Lakes are to maintain, and where possible, restore natural communities, provide cost effective resource protection for all properties, and provide opportunities for compatible public use. In FY2001, approximately 4,250 acres burned in wildfires (in March) caused by drought. Staff burned an additional 2,000 acres through prescribed/controlled fires in April 2001. Over 14,000 acres were treated for exotic plants. Staff also roller chopped 750 acres of dense wax myrtles to improve the conditions of the wet prairie communities on the Gardner-Cobb Marsh and Lightsey units.

Lake Marion Creek

The Lake Marion Creek Management Plan was implemented in 1999. Primary stewardship activities, which are consistent with the management plan, include prescribed burning, exotic plant control, resource protection, and public use. In FY2001, 150 acres of exotics were treated. Land stewardship staff prescribed burned over 800 acres and suppressed one wildfire. FWC participates as a cooperative management partner by conducting a hunt program and security patrols. The area is managed as a Type 1 Wildlife Management Area. The majority of the property is open for hiking year-round and camping is available by permit. Over 2,100 acres were purchased on a 50 percent cost sharing with Polk County Department of Natural Resources.

Lake Walk-in-Water

Polk County participated as a 50 percent acquisition partner under its Environmental Lands Program, and the county is also lead manager. The county contracted for preparation of a management and public use plan. It is being managed as the Sumica Natural Area after the historic logging town that existed on the site in the 1920s. The county is treating exotics and developing a prescribed burn plan, and it is open to limited public use. Wildfires were reported in Sumica in FY2001.

Loxahatchee River

District owned lands along the river are managed by FDEP Division of Recreation and Parks and Palm Beach County Parks and Recreation Department. FDEP manages the area north of SR 706 (Indiantown Road) as part of Jonathan Dickinson State Park. The county manages the lands south of the road as Riverbend County Park. Both managers have done extensive treatment of exotics. Palm Beach County, in conjunction with the District, is undertaking hydrologic restoration of its management area in an attempt to restore a major tributary to the Loxahatchee River. The restoration project, which is scheduled for completion by Summer 2002, should significantly increase freshwater flows in the river. FDEP manages its lands under the Jonathan Dickinson State Park plan. The

county has a development plan for Riverbend Park. A management plan will be developed as park development progresses.

Loxahatchee Slough

The District is currently managing the property, but agreements were made with Palm Beach County Department of Environmental Resources Management that will eventually result in District lands being managed by the county as part of their much larger Loxahatchee Slough natural Area. In 2000, the District signed a cooperative agreement with the Natural Resources Conservation Service that provides a 75 percent funding match for hydrologic restoration of old farm fields under the Wetland Reserve Program. Restoration efforts are currently underway to remove nuisance shrubs and exotic vegetation, plug ditches to restore hydrologic sheetflow, and replant former flatwoods in South Florida slash pine.

Model Lands

The Model Lands project will play a vital role in conveyance and treatment of sheetflow from the south Dade area to Florida Bay. It is a combination of fresh and saltwater wetlands that are heavily infested with exotic vegetation. Although the District owns more than 4,000 acres there is no public use program due to lack of legal access. The major management activity has been treating exotic vegetation. Hydrologic restoration in the form of ditch plugging is necessary, but cannot be undertaken due to patchy ownership and use of the canals for drainage by upstream landowners. No management plan has been prepared. Preparation is anticipated in late 2002.

Nicodemus Slough

Nicodemus Slough is the only SOR tract under management by a private entity. The District contracts with Aim Engineering, Inc. for management services that include exotic control, prescribed burning, and maintaining the public use facilities. A hydrologic restoration project that was undertaken by the District many years ago has been disappointing and has caused much dissatisfaction with the adjoining property owner. The District has been attempting to reach a suitable agreement with the adjoining landowner whereby the property would be sold to them and a conservation easement retained by the District.

North Fork St. Lucie River

State, county, and District-owned lands along the North Fork are being managed by St. Lucie County and FDEP, as part of the North Fork Aquatic Preserve. Both agencies are treating exotics and conducting limited prescribed burns. Burning is extremely difficult due to the surrounding urban development. In 2001 St. Lucie County dedicated a new environmental education center along the river that incorporates indoor displays with outdoor programming that utilizes interpretive trails, towers and boardwalks.

Okaloacoochee Slough

The Division of Forestry (DOF) and FWC purchased additional lands in the project that expand the original District/state purchase. The project is managed as Okaloacoochee Slough State Forest with DOF as the lead manager, and FWC responsible for wildlife management under a four-party lease agreement with the Division of State Lands and the District. FWC manages the project as a Type 1 wildlife management area and conducts a public hunt program. Exotic treatment, prescribed burning, and creating more public access have been the main management objectives. A draft management plan is undergoing internal review at this time.

Pal-Mar

The state and District-owned lands are under management lease to FWC. A management plan is scheduled for approval by the District and state in fall 2001. Resource inventories are being conducted by FWC and exotic infestations have been mapped. Exotic treatment and prescribed burning will commence in FY2002. The management plan calls for public use that includes hiking, horseback riding, camping, hunting, and fishing. FWC will manage the Martin County lands as Hyngryland Wildlife and Environmental Area. A plan to remove spoil and associated exotic vegetation that will also provide parking and public access is underway and expected to commence in FY2002. A plan is underway to sell lands owned by Palm Beach County that are north of SR 706 (Indiantown Road) to the state for management by FWC. Palm Beach County would continue to manage their lands south of Indiantown Road.

Reedy Creek

For management purposes the project is divided into Upper and Lower Reedy Creek. The Upper Reedy Creek Management Area includes those lands north of Pleasant Hill Road and is approximately 4,800 acres. The Lower Reedy Creek Management Area encompasses approximately 7 miles of creek corridor and totals approximately 5600 acres under ownership. Management goals for both areas are to conserve and protect water resources and supplies, protect and restore the land in its natural state and condition, and provide compatible public use opportunities. The Lake Russell Management Unit in Poinciana is jointly managed by Osceola County Schools as an environmental education facility. A center with classrooms and displays has been built, which provide interpretation to the scrub, Lake Russell, and floodplain swamp communities that exist on site. An interpretive hiking trail describes the unique plant communities and wildlife that exist in the scrub habitat of the site. District staff burned approximately 200 acres of the 550 acre site in August 2001. An additional 150 acres were burned at the Intercession City site and 250 acres were burned at the Poinciana unit in August 2001. FWC has identified the area of Lower Reedy Creek as a "Strategic Habitat Conservation Area," a "Biodiversity Hotspot," and a "Priority Wetland for Listed Species." These designations make the area a priority for preservation based on known occurrences of rare or listed species.

Shingle Creek

The District has undertaken several successful restoration projects within Shingle Creek Swamp, but the area still is not open due to a lack of legal public access. A management plan was completed in 1997 and should be updated in 2002. Exotics are being treated and prescribed burning has been done. Wildfires burned much of the District-owned lands in 2001 due to the drought. The Marriott development to the north has constructed a parking area and boardwalk/trail that leads to the District-owned lands. The two areas do not quite border each area and the homeowners association of the land in between have been unwilling to grant the District a public access easement. Negotiations are ongoing and we are still optimistic they will convey an easement. The District continues to develop public access and is confident it will be established soon.

Six Mile Cypress

The property is jointly owned by Lee County and has been managed by Lee County Parks and Recreation since acquisition began. The county updated the management plan in 2000. Treatment of exotic vegetation is ongoing. Prescribed burning is difficult due to the surrounding urban development. The county built and maintains a boardwalk and outdoor classroom facility that is used by thousands of Lee County students and citizens each year. Six Mile Cypress likely has the highest rate of public visitation of any SOR project.

South Fork St. Lucie River

The District has owned and managed the 184 acres along the South Fork since the mid-1980s. When the Atlantic Ridge project was purchased its lands border the South Fork property on both sides of the river. A separate management lease was entered into between FDEP and the District in 2001 for them to manage and incorporate the South Fork into Atlantic Ridge Preserve State Park. Exotic control and prescribed burning along the river will be incorporated into the park's annual work plan. FDEP will develop a public access point with Martin County along the west side of the river to allow visitors from the county's Halpatiokee Park to enter the South Fork.

Southern Glades

Southern Glades is managed by FWC under a lease agreement. The District is directing mitigation funds for habitat restoration that includes exotic removal and revegetation with native species. The District also funded construction of fishing platforms in FY2001. FWC has an ongoing program to treat exotics. The property is managed as a wildlife and environmental area and is open to airboating, hiking, fishing, hunting, bicycling, and horseback riding.

Tibet-Butler Preserve

Orange County Parks Department operates Tibet-Butler as an environmental education facility. A large enclosed education center with classrooms was constructed

several years ago. It has a full-time staff, which conducts programs for thousands of students each year. Land managers also treat exotic vegetation and maintain the system of hiking trails and boardwalks that lead to the many community types on the property. Limited prescribed burning has been done due to the small size of the site and close proximity to roads and urban development.

Appendix D:
IMPLEMENTATION SCHEDULE

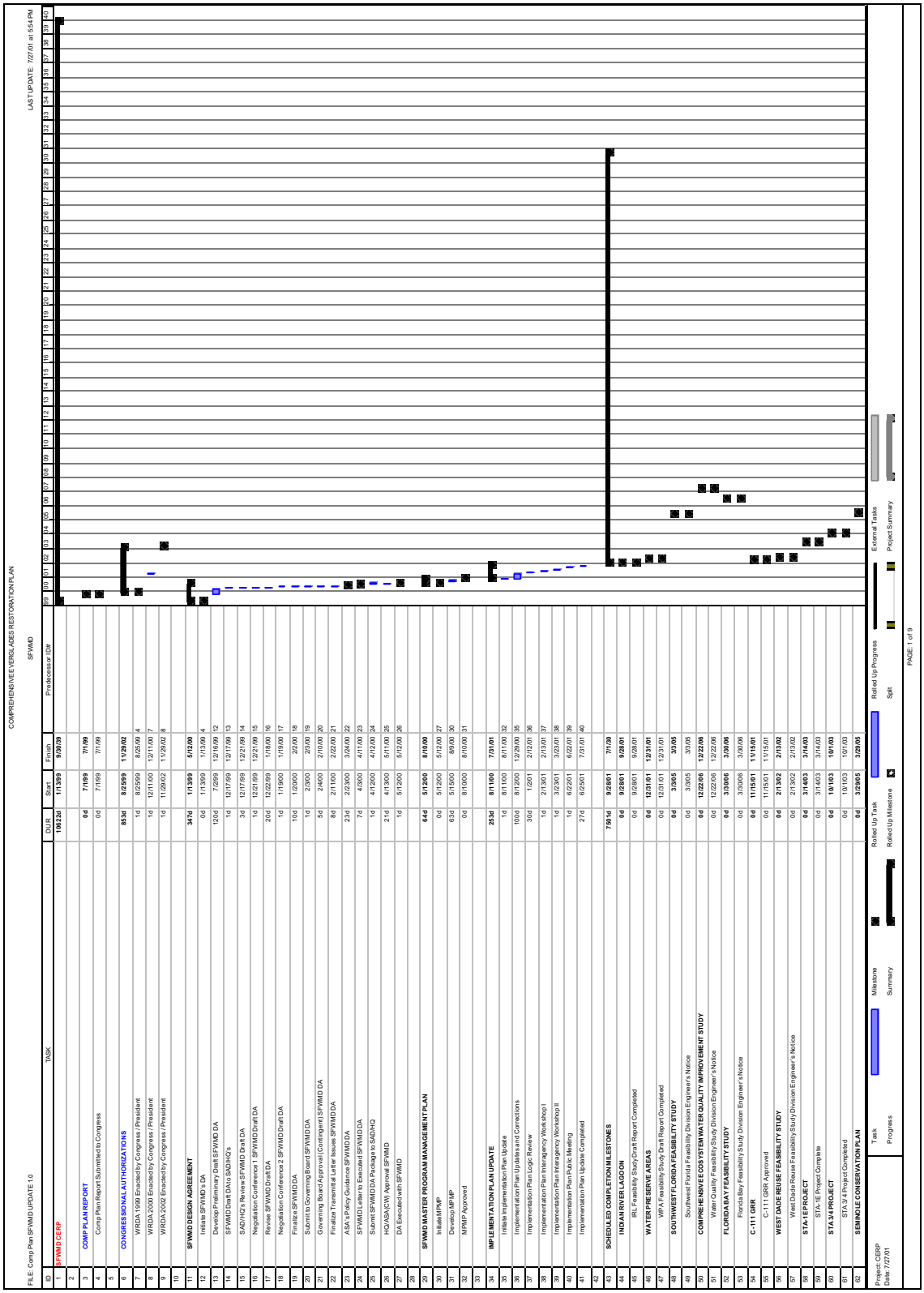


Figure D-1. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

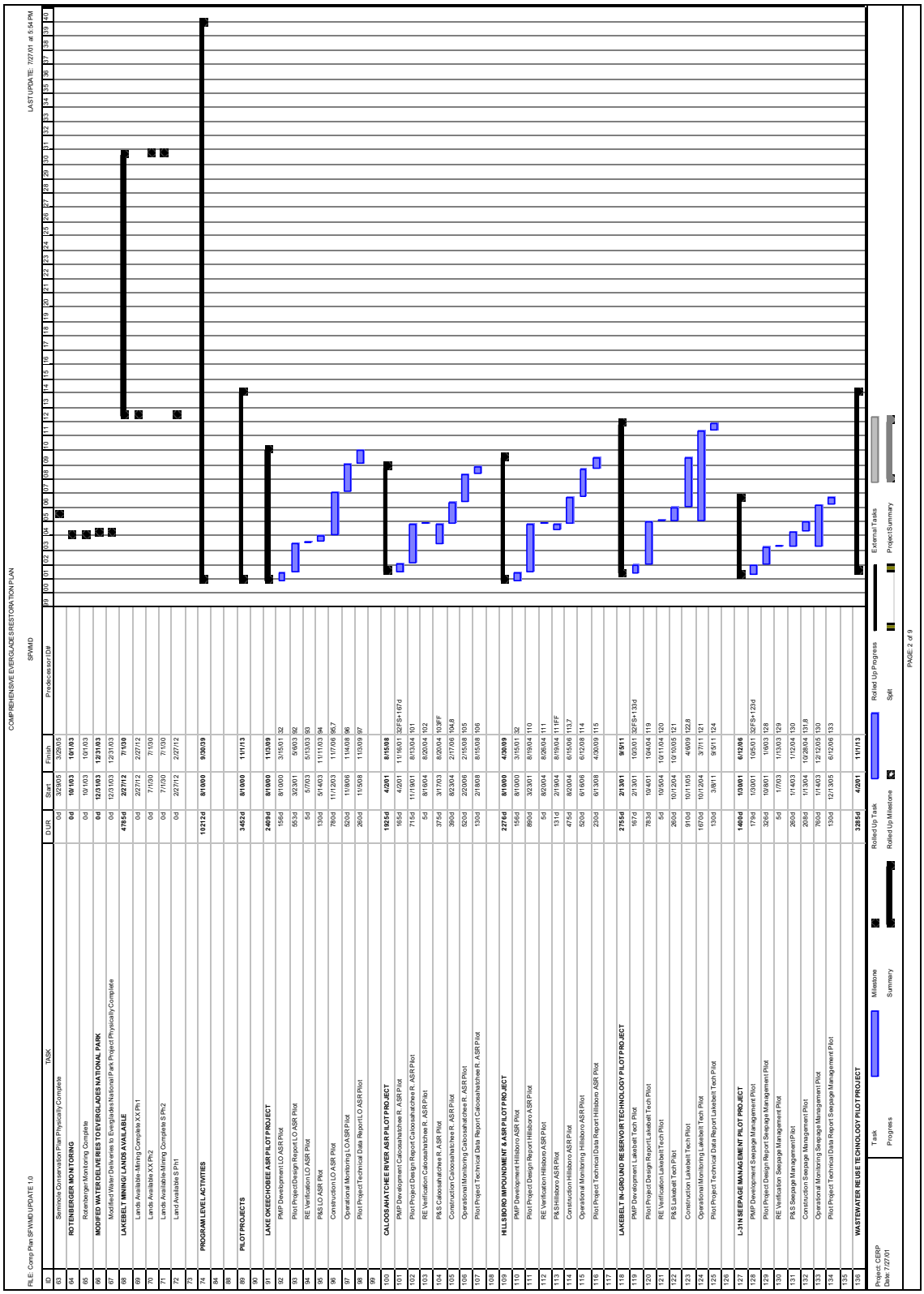


Figure D-2. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

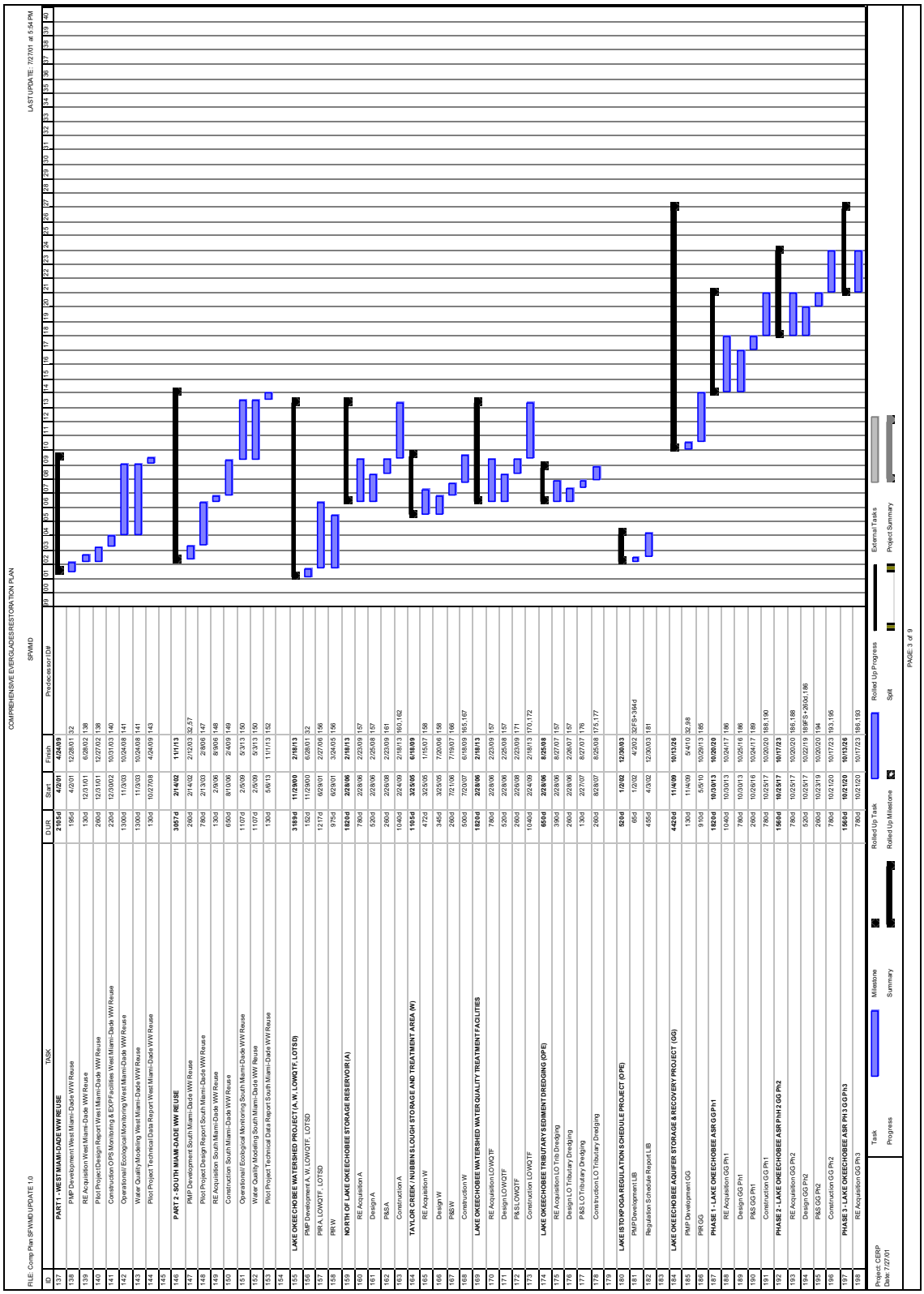


Figure D-3. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

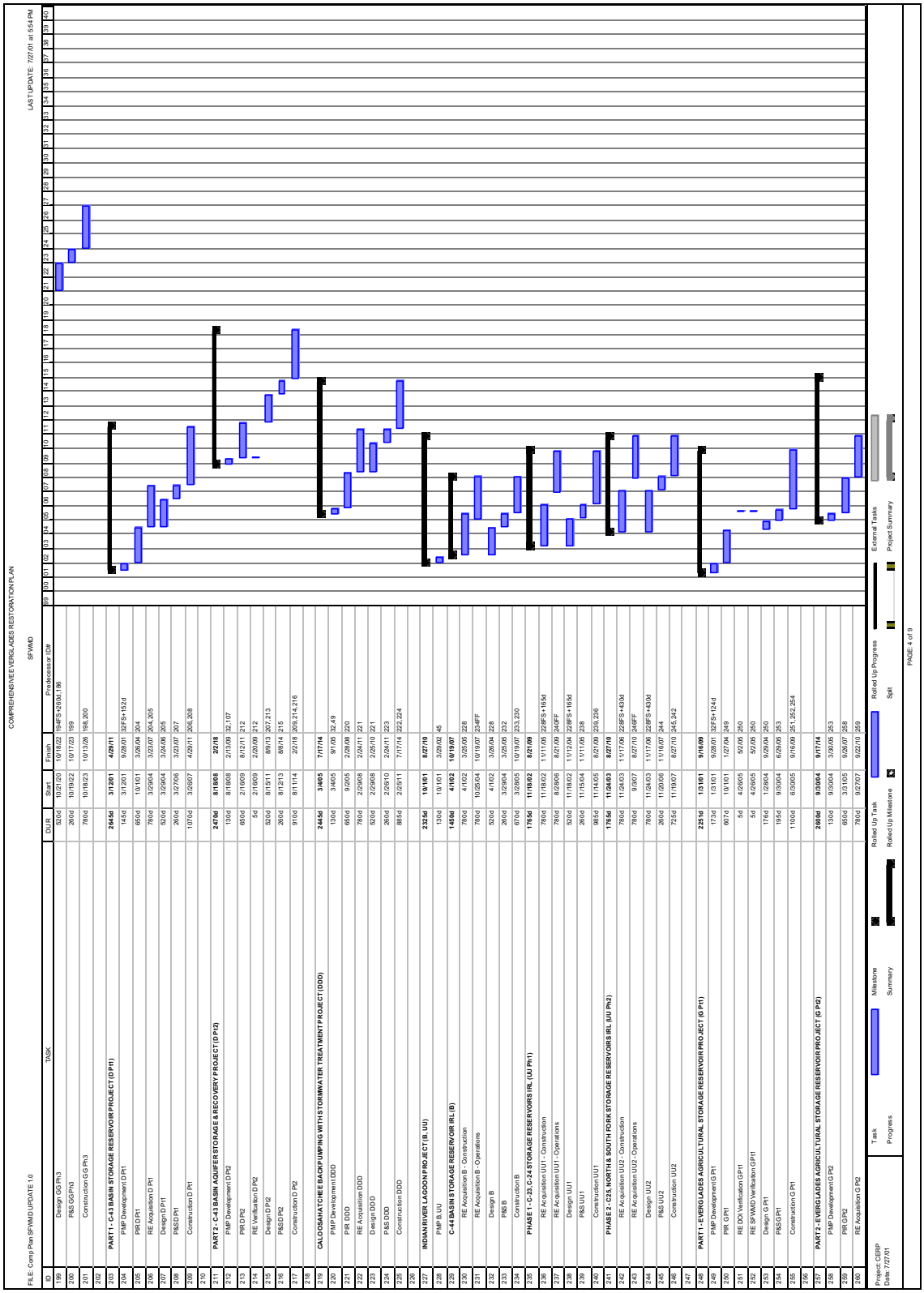


Figure D-4. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

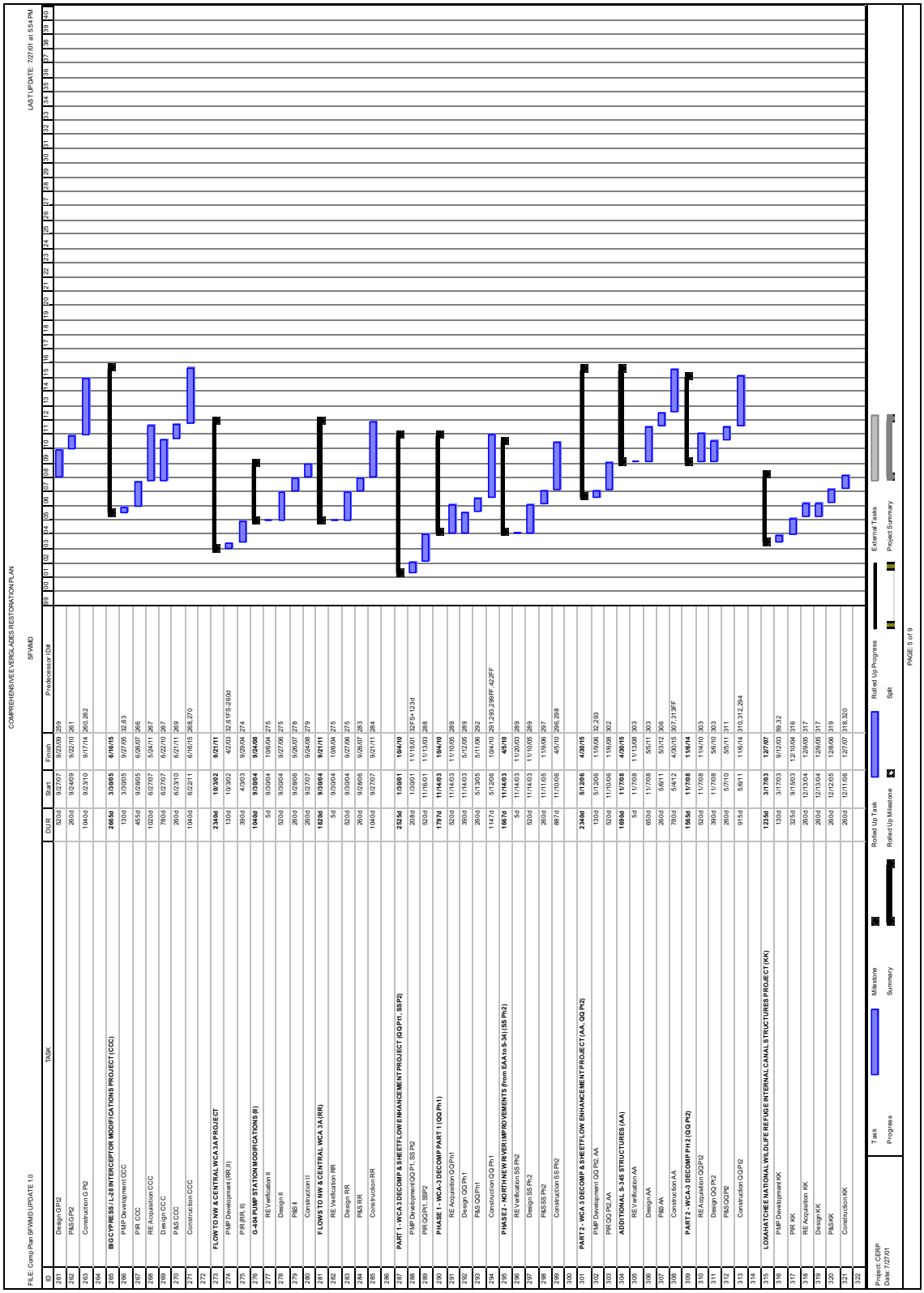


Figure D-5. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

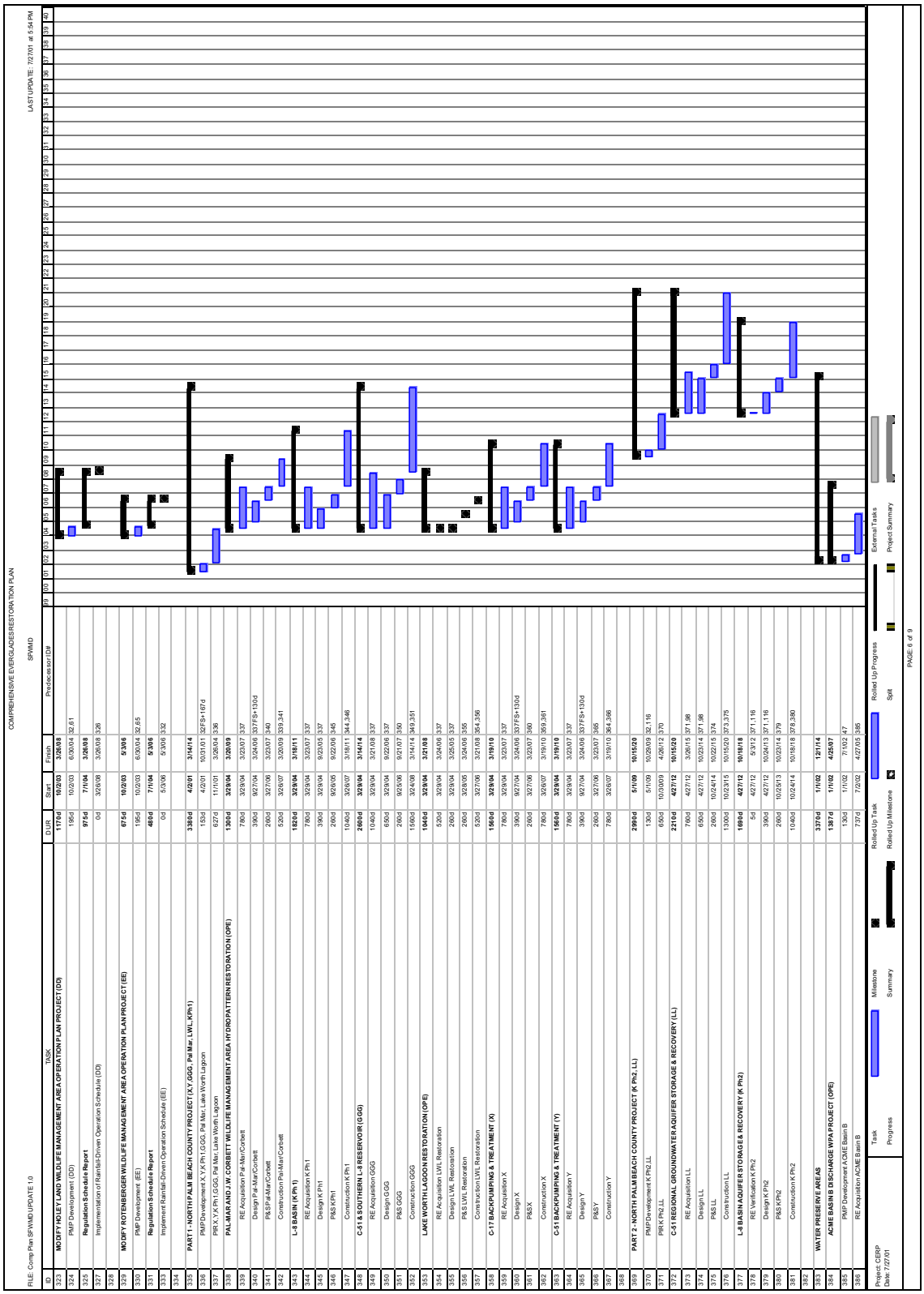


Figure D-6. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

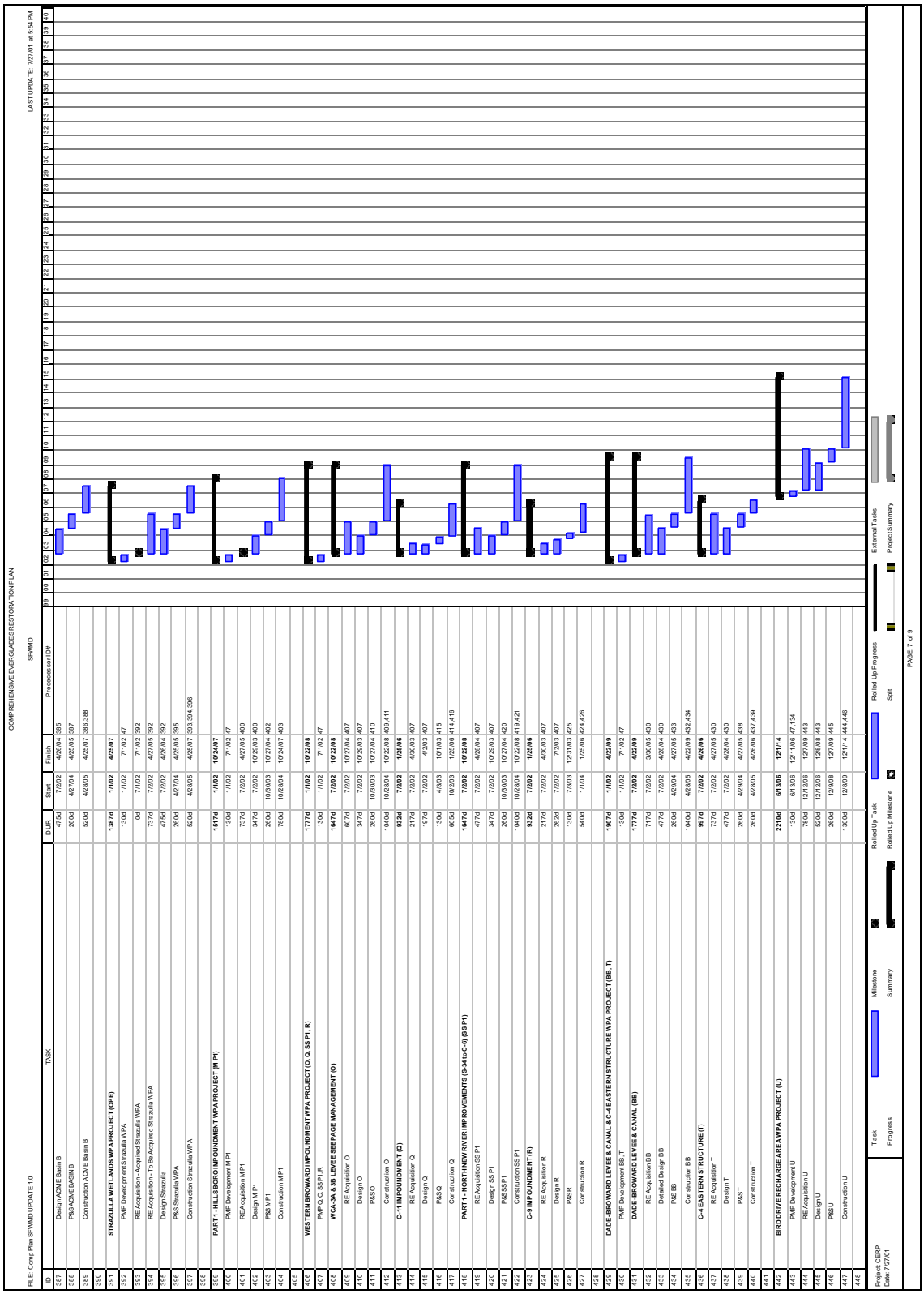


Figure D-7. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

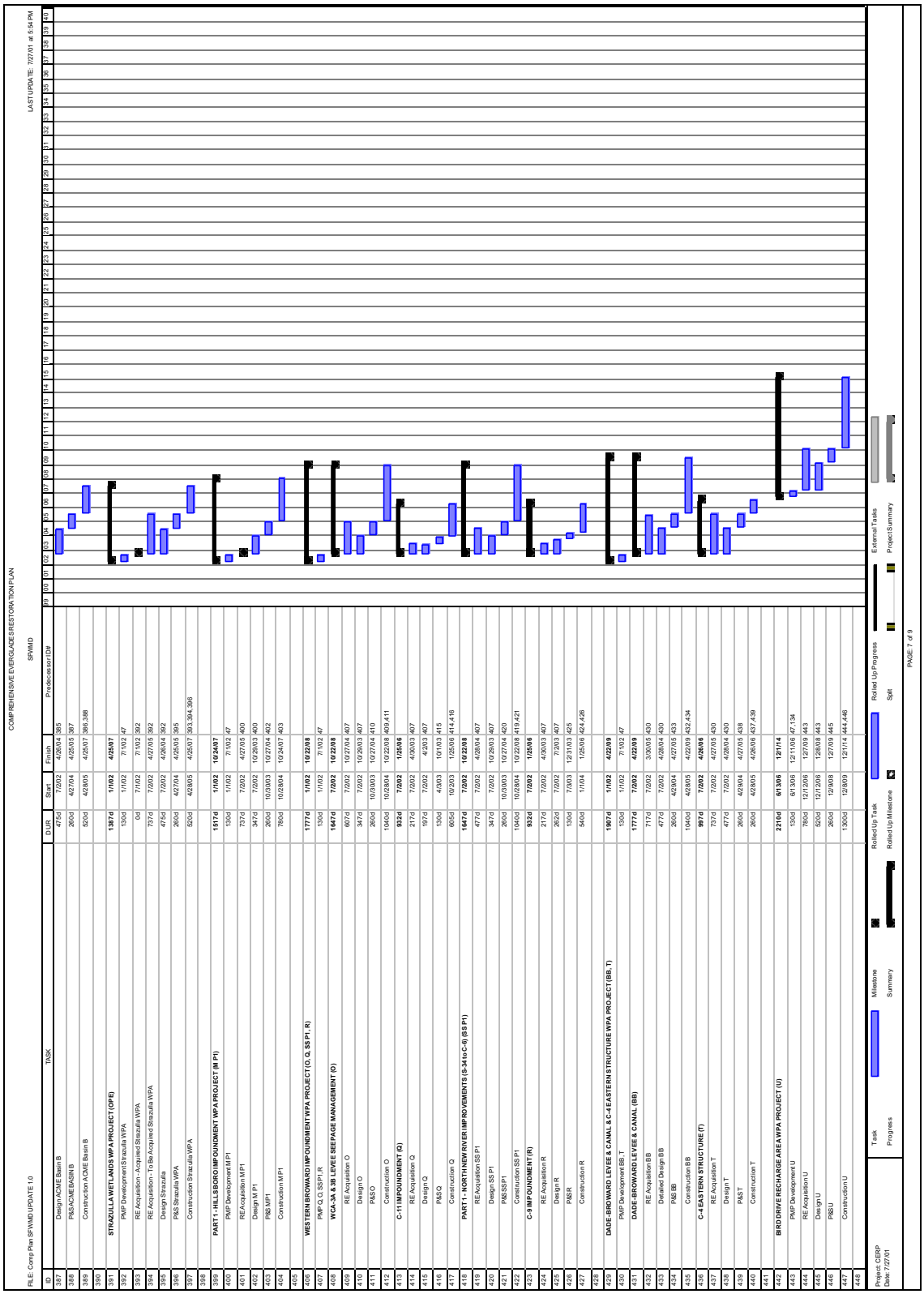


Figure D-8. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

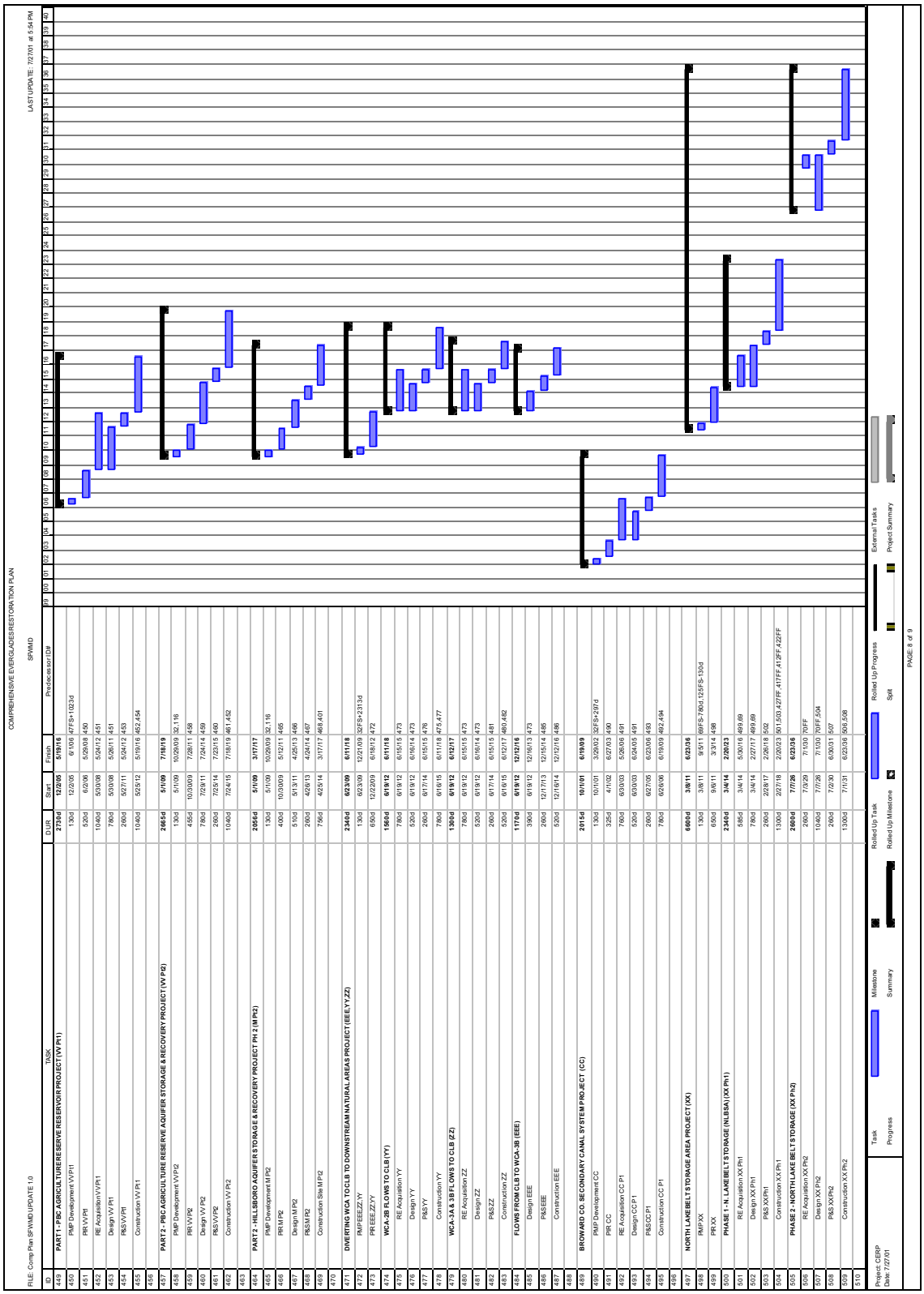


Figure D-9. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

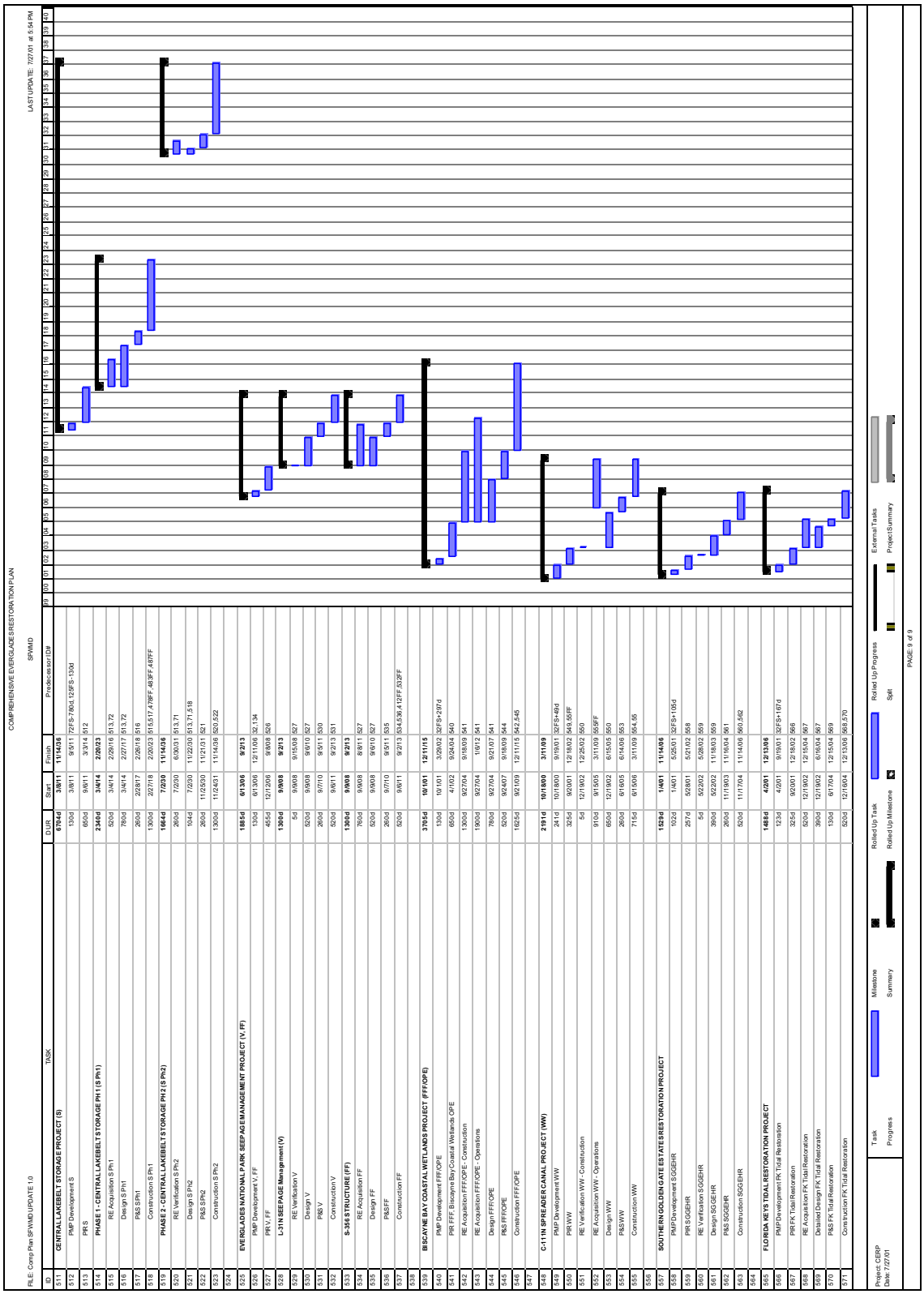
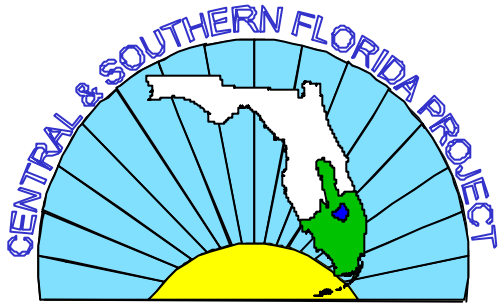


Figure D-10. July 2001 Implementation Schedule of Components Contained in the Comprehensive Plan.

July 2001

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN



COMPREHENSIVE EVERGLADES
RESTORATION PLAN

PROJECT MANAGEMENT PLAN

Lake Okeechobee Watershed Project

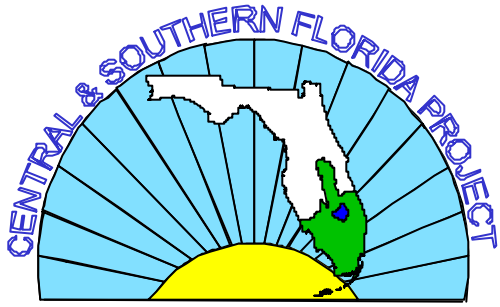
U.S. Army Corps of Engineers
Jacksonville District

South Florida
Water Management District

July 2001

CENTRAL AND SOUTHERN FLORIDA PROJECT

COMPREHENSIVE EVERGLADES RESTORATION PLAN



COMPREHENSIVE EVERGLADES
RESTORATION PLAN

PROJECT MANAGEMENT PLAN

Lake Okeechobee Watershed Project

U.S. Army Corps of Engineers
Jacksonville District

South Florida
Water Management District

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1.2 List of Acronyms

AFB	Alternatives Formulation Briefing
ASR	Aquifer Storage and Recovery
BCOE	Biddability, Constructibility, Operability, and Environmental
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
CAR	Coordination Act Report
CARL	Conservation and Recreation Lands
CEQ	Council on Environmental Quality
CERP	Comprehensive Everglades Restoration Plan
CESAJ	U.S. Army Engineer District, Jacksonville
COE	U.S. Army Corps of Engineers
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DCT	Design Coordination Team
DEP	Florida Department of Environmental Protection
DM	Design Memorandum
E&D	Engineering and Design
EAA	Everglades Agricultural Area
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
EQ	Environmental Quality
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection

FDOF	Florida Division of Forestry
FFWCC	Florida Fish and Wildlife Conservation Commission
FRC	Feasibility Review Conference
FSM	Feasibility Scoping Meeting
FS	Feasibility Study
FWC	Florida Fish and Wildlife Conservation Commission
FWCA	U.S. Fish and Wildlife Coordination Act
FWCAR	U.S. Fish and Wildlife Coordination Act Report
GIS	Geographic Information System
H&H	Hydrology and Hydraulics
HMS	Hydrologic Modeling System
HSPF	Hydrologic Simulation Program-Fortran
HTRW	Hazardous, Toxic, and Radioactive Waste
IFAS-UF	Institute of Food and Agricultural Sciences-University of Florida
IPR	In-Progress Review
IRC	Issue Resolution Conference
ITR	Independent Technical Review
LERRD	Lands, Easements, Rights-of-way, Relocations, and Disposal
LAKE	Lake Okeechobee
LO	Lake Okeechobee
LOWP	Lake Okeechobee Watershed Project
MCACES	Micro Computer Aided Cost Engineering System
MPMP	Master Program Management Plan
NED	National Economic Development
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NGP	Noticed General Permit
NMFS	National Marine Fishery Service
NOAA	U.S. National Oceanic and Atmospheric Administration
NPS	U.S. National Park Service
NRCS	U.S. Natural Resources Conservation Service
O&M	Operations and Maintenance
OBS	Organization Breakdown Structure
OMRR&R	Operation, Maintenance, Rehabilitation, Repair, and Replacement
OPE	Other Project Element
OSE	Other Social Effects
P	Phosphorus
P&G	Principles and Guidelines
P&S	Plans and Specifications
PAL	Planning Aid Letter
PCA	Project Cooperation Agreement

PDT	Project Delivery Team
PE	Project Engineer
PED	Pre-construction, Engineering, and Design
PIR	Project Implementation Report
PMP	Project Management Plan
QCM	Quality Control Manager
QCP	Quality Control Plan
RASTA	Reservoir Assisted Stormwater Treatment Area
RECOVER	Restoration, Coordination, and Verification
RED	Regional Economic Development
RES	Real Estate Supplement
Restudy	Central and Southern Florida Project Comprehensive Review Study
RFP	Request for Proposal
ROD	Record of Decision
SCS	Soil Conservation Service
SEIS	Supplemental Environmental Impact Statement
SFWMD	South Florida Water Management District
STA	Stormwater Treatment Area
SWIM	Lake Okeechobee Surface Water Improvement Management Plan
TMDL	Total Maximum Daily Load
TRC	Technical Review Conference
USACE	U.S. Army Corps of Engineers
USDA-NRCS	U.S. Department of Agriculture-Natural Resources Conservation Service
USGS	U.S. Geological Service
USFWS	U.S. Fish and Wildlife Service
VE	Value Engineering
WCA	Water Conservation Area
WQ	Water Quality
WQC	Water Quality Certification
WRDA	Water Resources Development Act

1.3 List of Project Management Plan Preparers

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1.4 Errata Sheets

This section is reserved for errata sheets that document changes to this PMP that occur between revisions.

1.5 List of Updates and Revisions

This section is reserved to document future updates and revisions to this PMP.

2.0 Project Information

2.1 Background

Lake Okeechobee (Lake) lies 30 miles west of the Atlantic Ocean and 60 miles east of the Gulf of Mexico, in the central part of the Florida peninsula (see fig. 1). The Lake itself is approximately 730 square miles (see fig. 2), and is the principal natural reservoir in south Florida. The Lake is located in portions of Palm Beach, Martin, Okeechobee, Glades, and Hendry Counties. Water flows into the Lake primarily from the Kissimmee River, Fisheating Creek, and Taylor Creek/Nubbin Slough. The Lake discharges east through the St. Lucie Canal (C-44) into the St. Lucie Estuary, west through the Caloosahatchee River (C-43) into the Caloosahatchee Estuary, and south through four major canals in the Everglades Agricultural Area (EAA) into the Water Conservation Areas (WCA).

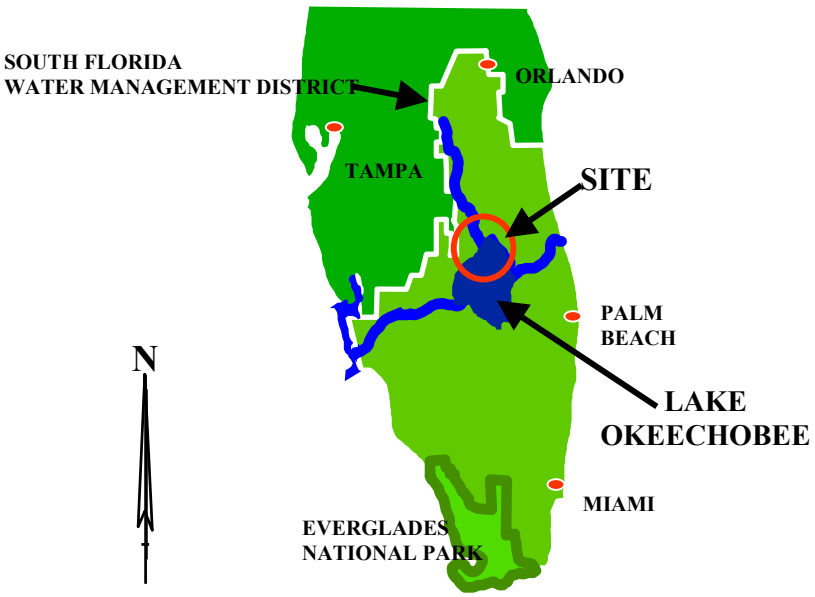

Figure 1

In the late 1860s, the Lake was much larger with an extensive wetland littoral zone along the shoreline. Water levels fluctuated between 17 feet and 23 feet above National Geodetic Vertical Datum (NGVD), and periodically flooded the exposed areas of the low-gradient marsh. Under both high and low conditions, there was abundant submerged and exposed habitat for fish and other wildlife. Structural works that modified the Lake began in the 1800's. The construction of the Herbert Hoover Dike and Features of the Central and Southern Florida (C&SF) Project has

significantly restricted the Lakes size and water level fluctuations. Most of the littoral zone is now at an elevation between 12 and 15 ft NGVD. As a result, when water levels are significantly above 15 feet NGVD, the entire littoral zone is flooded causing adverse impacts to the ecology of the littoral zone. When water levels are below +11 feet NGVD, the entire marsh is dry, and not available as habitat for fish and other aquatic life.

Water levels in the Lake are currently regulated by a complex system of pump stations, spillways, and locks, in accordance with a regulation schedule developed by the SFWMD and USACE. The regulation schedule is a guide that indicated limiting rates of releases required during various seasons of the year in an attempt to meet all functional objectives of the project, including flood control, water supply, navigation, and enhancement of fish and wildlife. The schedule is lowest prior to the wet season to provide both storage capacity and flood protection for the surrounding areas during the upcoming wet season. After peak of the hurricane season and prior to the beginning of the dry season, lake levels are allowed to increase to store water for the upcoming dry season. The schedule is also a guide for the management for high lake stages to help reduce the risk of flooding downstream lands.

Water quality data indicate that the Lake is currently in a eutrophic condition, primarily due to excessive nutrient loads from the agricultural sources both north and south of the Lake. In the late 1960s and early 1970s, total phosphorus concentrations as low as 50 parts per billion (ppb) were measured. Currently, total phosphorus concentrations in the Lake have been measured in the 100-ppb range. It is likely that historic in-lake turbidity was much lower than current conditions as well.

The C&SF Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement, April 1999, better known as the Restudy, looked at the existing project, its physical features and operations, with a view towards recommending structural and/or operational changes to better meet the goals of south Florida ecosystem restoration and the continued provision of safe, reliable water supply and flood protection for the people who live there. Ensuring sustainable water resources for the future, or "getting the water right," – the right quantity, quality, timing, and distribution – is what the Restudy is about.

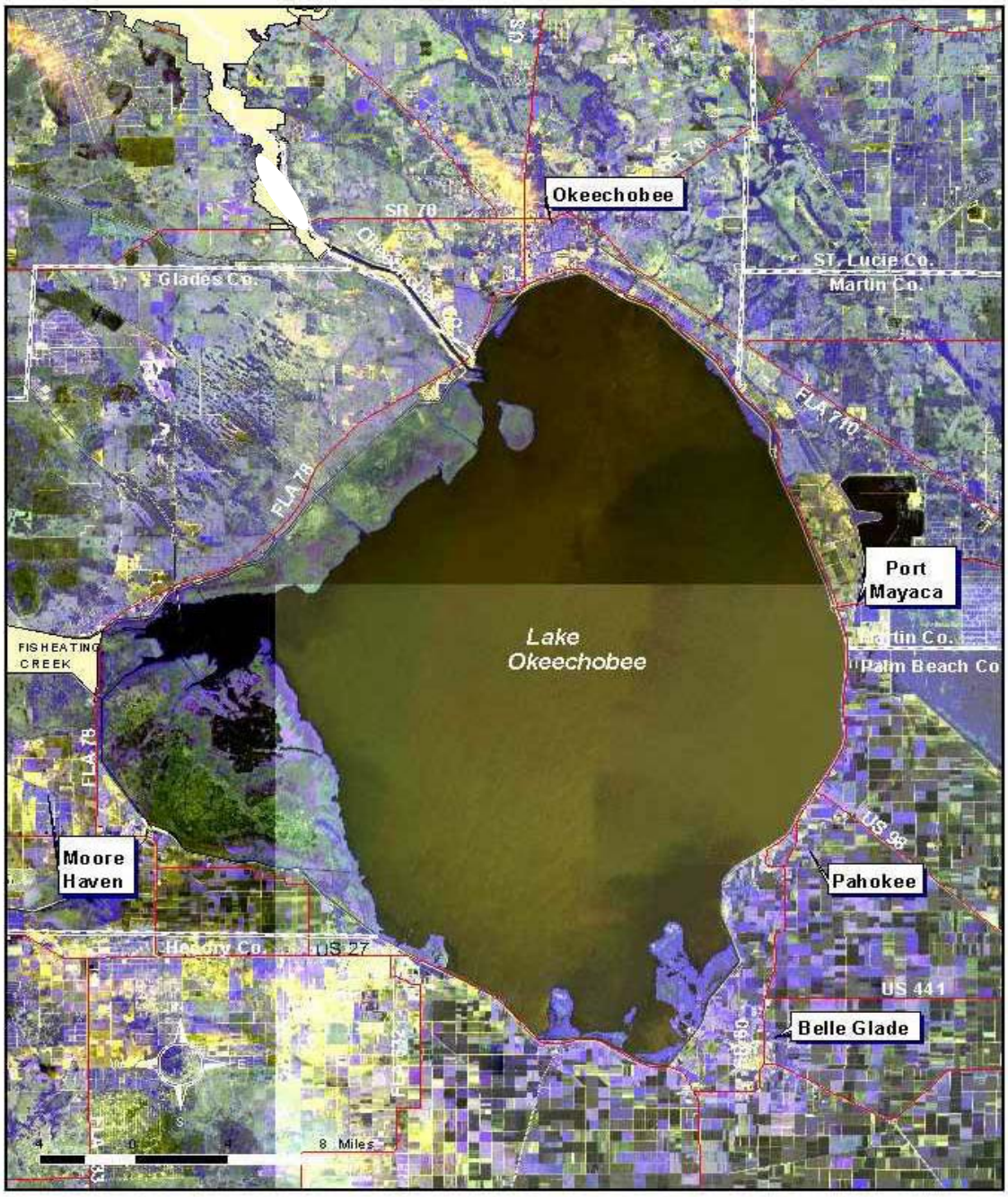

Figure 2. Lake Okeechobee Vicinity Map

The intent of the Restudy was to evaluate conditions within the C&SF project area and to recommend modifications to restore important functions and values of the Everglades and south Florida ecosystem and plan for the water resources needs of the people of south Florida for the next 50 years. This recommended plan is commonly referred to as the Comprehensive Everglades Restoration Plan (CERP) and will continue to be updated as project implementation occurs. The recommended modifications to the Lake Okeechobee Watershed Project area include the construction of 7,500 acres of stormwater treatment areas, 4,375 acres of

reservoir assisted stormwater treatment areas, 250,000 acre-feet of storage, the removal of 150 tons of phosphorus from tributaries, and the restoration of approximately 3,500 acres of wetlands.

A Design Agreement, between the South Florida Water Management District (SFWMD) and the Jacksonville District Corps of Engineers (USACE), was executed on May 12, 2000, for the Design of Elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project. The Design Agreement required the preparation of a Program Management Plan to provide an overall management strategy to implement the Comprehensive Everglades Restoration Plan (CERP). This Master Program Management Plan, executed on August 2000, describes how projects will be implemented by utilizing interagency, interdisciplinary, Project Delivery Teams (PDT).

Upon approval of this PMP the PDT will initiate studies required to prepare a Project Implementation Report. The Project Implementation Report will be developed to document the plan formulation, engineering and design work. The Project Implementation Report will provide information to bridge the gap between the conceptual design included in the Restudy and the detailed design necessary to advance a project to construction. The draft Project Implementation Report will be distributed for agency and public review prior to being submitted for Washington level review. The draft Project Implementation Report also will serve as the vehicle for seeking approval by the Florida Department of Environmental Protection under Section 373.1501 of the Florida Statutes. After receiving Florida Department of Environmental Protection and Washington level approvals, the Project Implementation Report will then be submitted for authorization.

This Project Management Plan is a living document that will be updated or revised, as necessary, throughout the life of the project. Updates are defined as changes to the Project Management Plan that occur on a regular basis and do not substantially modify the schedule, cost or annual management plan for the project. Scheduled revisions, after the completion of key major project development products, will reflect the changes in the project's scope or to reflect additional or better understanding of the project's development resulting from the completion of a decision document or design/acquisition document. The revisions will provide additional levels of detail for the upcoming project development phases based on information developed in the recently completed phase. Revisions will be scheduled upon completion of the Project Implementation Report in preparation for project design, and prior to the initiation of the construction phase, to support the development and the execution of a Project Cooperation Agreement.

2.2 Authority

The authority for this project is the Water Resources Development Act (WRDA) 2000. Implementation of the authority is contained within the "Design Agreement between the Department of the Army and the SFWMD for the Design of Elements of the Comprehensive Plan for the Everglades and South Florida Ecosystem Restoration Project." The Recommended Comprehensive Plan for the LOWP was identified in the Restudy, Integrated Feasibility Report & Programmatic Environmental Impact Statement, Vol. 1, Section 9.1.1, Kissimmee River Region, Subparts 1,2,3, &4.

The WRDA of 1999 included specific language on the in-kind work accomplished by the local sponsor. Section 528(e)(4) CREDIT- of the Water Resources Development Act of 1999 states:

> *(2) IN-KIND WORK –*
>
> *(A) IN GENERAL - During the pre-construction, engineering, and design phase and the construction phase of the Central and Southern Florida Project, the Secretary shall allow credit against the non-Federal share of the cost of activities described in subsection (b) for work performed by non-Federal interests at the request of the Secretary in furtherance of the design of features included in the comprehensive plan under that subsection. (B) AUDITS - In-kind work to be credited under subparagraph (A) shall be subject to audit.*

The Design Agreement to perform in-kind services on the projects as part of the Comprehensive Everglades Restoration Plan (CERP) was executed on 12 May 2000 between USACE and SFWMD. The Master Program Management Plan (MPMP) outlines the protocols and procedures by which project management plans for all projects will be completed. This document conforms to the guidance provided within the MPMP.

The Water Resources Development Act of 2000 provides additional guidance and authority for implementing CERP. Section 601, of the Act states:

> *(b) Comprehensive Everglades Restoration Plan -*
>
> *(1) Approval -*
>
> *(A) IN GENERAL. —Except as modified by this section, the Plan is approved as a framework for modifications and operational changes to the Central and Southern Florida Project that are needed to restore, preserve, and protect the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. 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.

Initial authorization for Taylor Creek/Nubbin Slough is contained in WRDA 2000 (which may require a separate PIR), Section 601(b)(2) Specific Authorizations, which states:

(C) INITIAL PROJECTS. —The following projects are authorized for implementation, after review and approval by the Secretary, subject to the conditions stated in subparagraph (D), at a total cost of $1,100,918,000, with an estimated Federal cost of $550,459,000 and an estimated non-Federal cost of $550,459,000:

(i) C–44 Basin Storage Reservoir, at a total cost of $112,562,000, with an estimated Federal cost of $56,281,000 and an estimated non-Federal cost of $56,281,000.

(ii) Everglades Agricultural Area Storage Reservoirs— Phase I, at a total cost of $233,408,000, with an estimated Federal cost of $116,704,000 and an estimated non-Federal cost of $116,704,000.

(vii) Taylor Creek/Nubbin Slough Storage and Treatment Area, at a total cost of $104,027,000, with an estimated Federal cost of $52,013,500 and an estimated non-Federal cost of $52,013,500.

(D) CONDITIONS. —

(i) PROJECT IMPLEMENTATION REPORTS. —Before implementation of a project described in any of clauses (i) through (x) of subparagraph (C), the Secretary shall review and approve for the project a project implementation report prepared in accordance with subsections (f) and (h).

(ii) SUBMISSION OF REPORT. —The Secretary shall submit to the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate the project implementation report required by sub-sections (f) and (h) for each project under this paragraph (including all relevant data and information on all costs).

(iii) FUNDING CONTINGENT ON APPROVAL. —No appropriation shall be made to construct any project under this paragraph if the project implementation report for the project has not been approved by resolutions adopted by the Committee on Transportation and Infrastructure of the House of Representatives and the Committee on Environment and Public Works of the Senate.

2.3 Description

The Recommended Comprehensive Plan (Restudy, Vol. 1, Section 9.1.1) for the **Lake Okeechobee Watershed Project** (LOWP) includes four components including: North of Lake Okeechobee Storage Reservoir, Taylor Creek/Nubbin Slough Storage and Treatment Area, Lake Okeechobee Watershed Water Quality Treatment Facilities, and Lake Okeechobee Tributary Sediment Dredging. These elements were combined for an opportunity to generate a more efficient design of the elements and address the interdependencies and tradeoffs between them. During preparation of the Watershed Assessment, it may be determined that separate PIRs need to be prepared. See Appendix B for mapping of the project area. The areas identified on the maps are general regions for the work elements as identified by CERP. The discussion that follows describes these elements as they were configured and evaluated in CERP.

2.3.1 North of Lake Okeechobee Storage Reservoir

This component includes an above ground reservoir and a 2,500-acre stormwater treatment area (STA). The total storage capacity of the reservoir is approximately 200,000 acre-feet and is located in the Kissimmee River Region, north of Lake Okeechobee. The specific location of this facility has not been identified; however, it is anticipated that the facility will be located in Glades, Highlands, or Okeechobee Counties. The initial design of this component assumed a 20,000-acre facility (17,500-acre reservoir and 2,500-acre treatment area) with water levels in the reservoir fluctuating up to 11.5 feet above grade. The final size, depth and configuration of this facility will be determined through more detailed planning, land suitability analyses, and design. Future detailed planning and design activities will also include an evaluation of degraded water bodies within the watersheds of the storage/treatment facility to determine appropriate pollution load reduction targets, and other water quality restoration targets for the watershed.

The purpose of this facility is to detain water during wet periods for later use during dry periods and reduce nutrient loads flowing to the lower Kissimmee River and Lake Okeechobee. This increased storage capacity will reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the Lake's littoral ecosystems and cause large discharges from the Lake that are damaging to the downstream estuary ecosystems. Depending upon the proposed location(s) of this water storage/treatment facility and pollutant loading conditions in the watershed(s), the facility could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets.

The operation of this component assumes that water from Lake Okeechobee, the Kissimmee River, and/or the S-65E drainage basin will be pumped into the storage reservoir when climate-based inflow models forecast that water levels in Lake Okeechobee will rise above desirable levels for the Lake's littoral zone. Water held

in the reservoir will be released when lake levels and forecasts indicate this will not cause ecological problems.

2.3.2 Taylor Creek/Nubbin Slough Storage and Treatment Area

This component includes an above ground reservoir with a total storage capacity of approximately 50,000 acre-feet and a STA with a capacity of approximately 20,000 acre-feet in the Taylor Creek/Nubbin Slough Basin. The initial design of this component assumed a reservoir of 5,000 acres and a STA of approximately 5,000 acres.

The purpose of this component is to attenuate flows to Lake Okeechobee and reduce the amount of nutrients flowing to the Lake. The component is designed to capture, store, and treat basin runoff during periods when levels in Lake Okeechobee are high or increasing. The water quality treatment element of this component is consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team and the Pollution Load Reduction Goals for Lake Okeechobee developed for the Lake Okeechobee Surface Water Improvement and Management Plan (SFWMD, 1997f). The water held in the reservoir would be released to Lake Okeechobee when lake levels and forecasts indicate this will not cause ecological problems.

2.3.3 Lake Okeechobee Watershed Water Quality Treatment Facilities

This component includes two reservoir-assisted stormwater treatment areas (RaSTA) and plugging of select local drainage ditches. The initial design of these RaSTA's assumes a 1,775-acre facility in the S-154 basin located in Okeechobee County and a 2,600-acre facility in the S-65D sub-basin of the Kissimmee River Basin located in Highlands and Okeechobee counties. The plugged drainage ditches will result in restoration of approximately 3,500 acres of wetlands throughout the Lake Okeechobee watershed basin. This component is also consistent with the recommendations of the South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team for achieving water quality restoration objectives in the Lake and should provide significant long-term water quality benefits for the Lake.

The other portion of this component includes the purchase of conservation easements within four key basins of Lake Okeechobee to restore the hydrology of isolated wetlands by plugging the connection to drainage ditches and the diversion of canal flows to adjacent wetlands. The sites range in size from an individual wetland to an entire sub-basin and are located within the lower Kissimmee River Basins (S-65D, S-65E, and S-154) and Taylor Creek/Nubbin Slough Basin (S-191).

The purpose of this component is to attenuate peak flows and reduce phosphorus loading into Lake Okeechobee. In addition, many of the wetlands in the Lake Okeechobee watershed have been ditched and drained for agriculture water supply and flood control. This component will restore the hydrology of selected isolated and riverine wetlands in the region by plugging these drainage ditches.

The South Florida Ecosystem Restoration Working Group's Lake Okeechobee Issue Team identified six primary tributary basins (C-41 Basin, Fisheating Creek, Taylor Creek/Nubbin Slough, S-154 Basin, S-65D (Pool D) Basin, S-65E (Pool E) Basin) that contribute significant phosphorus loads to the Lake. The water quality goals for the lake are articulated in the Lake Okeechobee Surface Water Improvement Management (SWIM) Plan. In support of these goals, and in order to further reduce nutrient loading to Lake Okeechobee, there may potentially be other RASTA's needed in the watershed (such as in the C-41 and Fisheating Creek Basins) that are not included in this component of construction. Therefore, it is proposed that a comprehensive plan for the Lake Okeechobee watershed be developed before the final configuration of this construction component is implemented. A comprehensive Lake Okeechobee watershed plan would include elements of the Lake Okeechobee Surface Water Management Plan and remediation programs developed to achieve appropriate pollution reduction targets established for the Lake.

2.3.4 Lake Okeechobee Tributary Sediment Dredging

This component includes the dredging of sediments from 10 miles of primary canals within an eight-basin area in the northern watershed of Lake Okeechobee. The initial design assumes that the dredged material will contain approximately 150 tons of phosphorus.

The purpose of this component is to remove phosphorous in canals located in areas with high concentrations of phosphorus runoff in the Lake Okeechobee watershed. These sediments presently contribute to the excessive phosphorus loading to Lake Okeechobee. Under separate funding, SFWMD is planning a demonstration project consisting of sedimentation traps to determine the feasibility of phosphorous removal by this method. The project will be a two-year demonstration with construction starting in FY2000. Upon completion in 2001, the traps will be operated and monitored to determine effectiveness. If feasible, findings from this demonstration will be incorporated into the design for this component. This component is also consistent with the water quality restoration goals for the Lake included in the Lake Okeechobee Surface Water Management Plan and subsequently developed by the Lake Okeechobee Issue Team. Implementation of this component will also complement other activities associated with pollution reduction for the Lake.

2.4 Related Projects

There are a number of proposed and ongoing activities within the project area to benefit water quality. The following is a list of major activities within the area (not including numerous local and/or on farm based activities).

See Appendix B for map "Related Projects Within Area of Site".

2.4.1 In-Lake Research and Assessment Programs.

SFWMD conducts Submerged Aquatic Vegetation mapping/growth; Exotic plant control; WQ model; Hydrodynamic model; Sediment removal feasibility; Pilot dredging study; P impacts from dredging; WQ monitoring.

2.4.2 Works of the District (Regulatory Program).

SFWMD inventories and permits all non-dairy land use activities; ID high Phosphorous source areas through Water Quality surveys; Monitor for compliance with Surface Water Improvement and Management Plan (SWIM); Require corrective actions on parcels that are exceeding Phosphorous limits; expanded compliance monitoring.

2.4.3 Kissimmee River Project.

This is a joint USACE-SFWMD project. The upper basin portion of the project consists of water regulation schedule modifications, canal and structure improvements, and land acquisition. This will result in environmental benefits in the upper chain of lakes and in the lower basin. More natural fluctuations of water levels will enhance the peripheral marshes of the lakes. Reestablishing a more natural timing of flows to the lower basin will result in restoration or enhancement of the ecosystem. Structural improvements will include enlargements of existing canals and existing water control structures. The project is addressing restoration of natural flooding of the floodplain to reestablish historic wetland conditions.

2.4.4 Aquifer Storage and Recovery (ASR).

The project concept is to store surface water or groundwater, treated to meet water quality standards, in the underlying Floridian Aquifer System using ASR wells to place the water in storage and subsequently to recover during dry periods. Among other benefits, implementation of regional ASR technology at the Lake Okeechobee site would help to minimize high-volume water releases to the St. Lucie and Caloosahatchee estuaries. During dry periods, water recovered from the ASR wells would be used to maintain the surface water level within the lake and associated canals throughout the Everglades, and to augment water supply deliveries. ASR

technology provides storage - an important component that will contribute to the overall Everglades restoration. The CERP includes the construction of up to 200 ASR wells (with associated pre- and post- treatment facilities) installed adjacent to Lake Okeechobee, with a total combined pumping capacity of 1 billion gallons of water per day.

The level and extent of treatment and number of the aquifer storage and recovery wells may be modified based on the findings from the planned pilot tests. The pilot tests will also investigate changes to water chemistry resulting from aquifer storage and identify post-retrieval water quality treatment requirements, if any, necessary to implement full-scale aquifer storage and recovery facilities.

2.4.5 Regional-Scale Hydrogeologic Investigation.

This investigation will likely include water-level data acquisition throughout much of south Florida, additional hydrogeologic studies, groundwater modeling, geochemical investigations, and a rock fracturing potential analysis. This regional investigation will be performed as a separate but associated project within CERP. Information gathered during the regional investigation will be used along with the results of the individual ASR pilot projects as envisioned in CERP.

2.4.6 EAA Storage Reservoir, Phases 1 and 2.

This CERP project is located in the EAA in west Palm Beach County. There are two components: conveyance capacity increases for the Miami, North New River, Bolles, and Cross Canals; and above ground reservoir capacity of 360,000 (Phase 1 - 240,000, Phase 2 - 120,000) acre-feet. A significant portion of the project will be located in lands purchased in the Talisman Land Agreement. The reservoir capacity will provide for irrigation requirements in the EAA, environmental deliveries of water to the WCA's, storage of regulatory releases from Lake Okeechobee, and increased flood protection within the EAA.

2.4.7 Lake Okeechobee Water Retention and Phosphorus Removal Critical Restoration Project.

The Lake Okeechobee Water Retention and Phosphorus Removal Critical Restoration Project is a part of CERP, which includes the construction of STA's, and restoration of isolated wetlands. The STA's are constructed wetland treatment systems for reducing phosphorus loads for agricultural drainage water through biological uptake, sedimentation, direct filtration, and other methods. The Taylor Creek site is a 200-acre site 1.4 miles north of the City of Okeechobee. Approximately 169 acres of the site will be developed as an STA; the remaining area will be used for project structures or dedicated to preservation of cypress tree stands. The Nubbin Slough site is 6.5 miles southeast of the City of Okeechobee. The site totals 2,135 acres with just over half (1,100 acres) devoted to phosphorus

removal as an STA; 670 acres are available for treatment but are not to be used in this project, the remainder is occupied by forest and is assumed to be taken up by future project structures.

2.4.8 Grassy Island Land Acquisition.

SFWMD is pursuing acquisition of ~4,800 acres west of Taylor Creek for use as a reservoir and an STA. Flows from Taylor Creek and Wolf Creek would be retained, treated, and discharged. Because the location, size and condition of this property are ideal for capturing and treating virtually all of the Taylor Creek and Wolf Creek flows, the SFWMD is acquiring this property in anticipation of using it for the Taylor Creek/Nubin Slough Storage and Treatment Project.

2.4.9 Lake Okeechobee Protection Plan (LOPP), Agricultural Non-point Source.

The cornerstone of the agricultural non-point source LOPP is the development and implementation of farm-specific Comprehensive Nutrient Management Plans (CNMP's). The Department of Agriculture and Consumer services (DACS), working in cooperation with SFWMD, will oversee the development of CNMP's for all agricultural non-point sources in the four priority basins (C-41, S-191, S-154 & Pools D & E). These CNMP's will be developed using USDA, Natural Resource Conservation Service's specifications and will provide the data necessary for the DACS and SFWMD to prioritize land parcels and specific Best Management Practices (BMP's) to achieve the greatest phosphorus load reduction. Data from the final draft of the "Lake Okeechobee Action Plan" reveal that the phosphorus load from the four priority basins is 104.5 tons over the Surface Water Improvement & Management (SWIM) mandated target. Sixty-three percent (65.8 tons) of the excess load comes from S-191 where most of the dairies are located.

2.4.10 Dairy Rule, Florida Department of Environmental Protection.

2.4.11 Lake Okeechobee Total Maximum Daily Load, Florida Department of Environmental Protection and U.S. Environmental Protection Agency.

The Total Maximum Daily Load for total phosphorus for Lake Okeechobee shall be 140 metric tons, including atmospheric deposition. Attainment of the TMDL shall be calculated using a 5-year rolling average of the monthly loads calculated from measured flow and concentration values.

2.4.12 C-43 Basin Projects.

These CERP projects include:

- C-43 Reservoir Part 1 - aboveground reservoir with a total storage capacity of approximately 160,000 acre-feet located in the C-43 Basin. The purpose is to capture C-43 Basin runoff and releases from Lake Okeechobee.
- C-43 ASR.
- C-43 Backpumping with STA - a 5000-acre STA and facilities for backpumping excess Caloosahatchee basin water into Lake Okeechobee. The STA treatment capacity will be available to treat lake water during periods when Caloosahatchee water is not being backpumped.

The facilities in the C-43 Basin will be designed for water supply benefits and some flood attenuation. They will provide environmental water supply deliveries to the Caloosahatchee Estuary and water quality benefits to reduce salinity and nutrient impacts of runoff to the estuary.

2.4.13 IRL Restoration Feasibility Study.

The original CERP design for the C-44 Basin has been updated in the Indian River Lagoon Feasibility study. The reservoir and STA's will treat C-44 basin water before discharge to Lake Okeechobee or the St. Lucie Estuary. Lake Okeechobee water can be treated when capacity is not being used to treat C-44 Basin water.

2.4.14 Other Projects.

Soil Amendment BMP's; Beef cattle BMP's; Tributary sediment removal; Dairy Best Available Technologies; Biosolid fate/transport; Assimilation algorithms; Lake Istokpoga regulation schedule; LO protection permits; LO SWIM Plan update; Watershed P budget; economic valuation (P control); Herbert Hoover Dike Major Rehabilitation Program.

3.0 Project Scope

3.1 Statement of Project Scope

The purpose of this project is to improve the water quality of Lake Okeechobee, provide for better management of lake water levels, and reduce damaging releases to the estuaries. Water from the watershed and the lake will be detained in large storage areas during wet periods for later use during dry periods. The increased storage capacity will reduce the duration and frequency of both high and low water levels in the lake that are stressful to its littoral zone ecosystems, and will reduce large discharges from the lake that are damaging to the downstream estuarine ecosystems. Water from upstream tributaries will be diverted to STA's to reduce nutrient loading into the lake. In addition, the project will restore the hydrology of isolated wetlands by plugging the connections to drainage ditches and diverting canal flows to adjacent wetlands.

A Watershed Assessment will evaluate the collective scope and magnitude of the four components of the LOWP in terms of the authorized project purposes, the total cost, and performance/function. It will include hydrologic and water quality characterization of the basins that comprise the watershed. An assessment of water quality treatment and storage needs of each basin is essential so that the functions of the four components can be optimally allocated throughout the watershed.

Monitoring is a long-term effort that will measure the performance of the project at the basin-scale, or tributary, level. The basin-scale effort will start immediately and measure phosphorus loads and flows from individual basins in the watershed throughout the life of the project. This information will be used to evaluate the performance of CERP projects and all other interagency and private projects in the basin. This effort will be in addition to programmatic monitoring, conducted under the auspices of RECOVER, and project-scale monitoring, implemented during construction.

The results of the Watershed Assessment will focus subsequent project-specific planning efforts to the basins that are most appropriate. The Watershed Assessment will also provide the basis for developing the PIR work plan. At this time, it is anticipated that an interim PIR will be prepared for the Taylor Creek/Nubbin Slough Storage and Treatment Project and the final PIR will address the remainder of the Okeechobee Watershed projects. However, the results of the Watershed Assessment may show that the work should be allocated in another manner.

The Mission Statement for the Lake Okeechobee Watershed Project is:

"Improve the water quality of Lake Okeechobee to meet federal and state standards, and provide for water levels to improve the habitats within the lake and downstream bodies. Build appropriate storage and treatment facilities to capture and treat surface water discharges into the Lake Okeechobee watershed; and remove water from the lake for water quality and water level management in accordance with the guidelines, regulations and timelines delineated in the Comprehensive Plan."

3.2 Project Goals and Objectives

The PDT has identified a number of project goals that will be utilized during advanced plan formulation. The goals are categorized into functional areas.

3.2.1 Water Quality

Goal 1: Phosphorus Reduction
- Sub-Goal 1a: Reduce phosphorus loading to the Lake

3.2.2 Lake Levels

Goal 2: Meet mandated water quality controls/targets

Goal 3: Improve Storage in Watershed and Lake
- Sub-Goal 3a: Achieve a more managed range of lake levels
- Sub-Goal 3b: Reduce regulatory releases to estuaries
- Sub-Goal 3c: Meet water supply goals for humans and environment

Goal 4: Lake level maintenance

3.2.3 Environment

Goal 5: Consider benefits and impacts to the natural environment
- Sub-Goal 5a: Increase acreage of wetlands
- Sub-Goal 5b: Apply environmentally friendly design
- Sub-Goal 5c: Protect listed species
- Sub-Goal 5d: Limit environmental impact
- Sub-Goal 5e: Enhance fish and wildlife habitat
- Sub-Goal 5f: Minimize threat to wildlife in facilities
- Sub-Goal 5g: Control/Eradicate exotic plants
- Sub-Goal 5h: Consider wetland functions

Goal 6: Consider benefits and impact to the human environment

Sub-Goal 6a: Look at economic benefits to the nation and community, i.e., agriculture
Sub-Goal 6b: Ensure Public Outreach (social and economic Environmental justice)
Sub-Goal 6c: Minimize adverse impact to local economy
Sub-Goal 6d: Optimize land use
Sub-Goal 6e: Provide recreational enhancement where possible

3.2.4 Compatibility

Goal 7: Ensure compatibility with related projects
Sub-Goal 7a: Enhance purposes of other projects
Sub-Goal 7b: Meet system-wide performance measures
Sub-Goal 7c: Attain goals in related projects within the watershed

3.2.5 Cost and Schedule

Goal 8: Monitor cost and schedule
Sub-Goal 8a: Meet schedule
Sub-Goal 8b: Maintain allocated costs
Sub-Goal 8c: Reach cost effectiveness and value in design

3.2.6 Other

Goal 9: Make best use of technology
Sub-Goal 9a: Achieve operational integrity (flexible/rigid)
Sub-Goal 9b: Increase use of resources
Sub-Goal 9c: Attain robust operational capabilities
Sub-Goal 9d: Implement innovative technologies
Sub-Goal 9e: Maximize efficiency in project
Sub-Goal 9f: Increase certainty in data and results

Goal 10: Encourage public involvement
Sub-Goal 10a: Hold public workshops before decisions area made
Sub-Goal 10b: Conduct public outreach in all phases of project

3.3 Project Constraints and Assumptions

The goals of the LOWP shall be in accord with the goals of:

- Kissimmee River Restoration Project.
- Other projects that provide storage for Lake Okeechobee as described in CERP. Namely, Okeechobee ASR, EAA Reservoir Storage, C-43 ASR, C-43 Backpumping with STA, C-43 Reservoir Part 1, and C-44 Basin Storage.

- Other source control measures planned or implemented by private landowners with help from state and federal agencies.

3.4 Statement of Scope Changes from the Comprehensive Plan

There are no significant differences between the project described in this Project Management Plan and the project as it was described in the Restudy. However, the current plan includes two products considered essential by the PDT: 1) a watershed assessment report, and 2) implementation of basin-scale monitoring. These interim products will provide necessary information for subsequent advanced plan formulation and evaluation goals. In all likelihood, the PIR for the project will be configured to produce two, or more, separate reports: 1) an initial PIR for the Taylor Creek/Nubbin Slough STA component, and 2) a second PIR for the remaining three components. The first PIR would include elements of design and would expedite completion of the first component, given that Taylor Creek/Nubbin Slough STA has contingent authorization in WRDA 2000. The second PIR is needed to request authorization of the three remaining projects in a future WRDA.

4.0 Work Breakdown Structure

The Work Breakdown Structure is a deliverable-oriented grouping of project elements that organizes and defines the total scope of the project. The Work Breakdown Structure identifies the sub-products that will be required to implement the total project and the hierarchical arrangement of all activities associated with completing each of the required sub-products. The WBS is attached in Appendix C.

A project dictionary was prepared to assist in the Work Breakdown Structure. The dictionary listed the WBS Identification, Short Task Description, a detailed Long Task Description, estimate Duration of effort, estimated Cost (based upon $57.00 per hour x duration), known Assumptions for task, and known Predecessors.

4.1 Product Identification

The PDT developed the WBS that is contained in Appendix C. The WBS hierarchy was reduced to its lowest task level for project scheduling and budget purposes. Activities are the lowest levels that have resources to perform the work. Tasks refer to individual work actions that make up an activity but do not have resources, cost, or duration assigned directly to them.

4.2 Activity Identification

The Project Delivery Team developed an initial activity duration estimate for the activities developed during the work breakdown analysis. This initial estimate is a rough order of magnitude estimate based on the initial manpower requirement assessment and historical information from past projects.

4.3 Responsibility Identification

This section is reserved for documents that will be developed and made available at a later date.

5.0 Organizational Breakdown Structure

The Organization Breakdown Structure specifies the agency and action office (e.g. department, division, section, or branch, etc.) responsible for performing each activity in the Project Management Plan. Each office responsible for an activity is represented by an office symbol or unique designation. This section specifically delineates each agency's role and responsibilities. The division of labor for each major segment of work is reflected in a chart in Appendix D, Tab C.

6.0 Responsibility Assignment Matrix

See Appendix D, Tab D

7.0 Functional Area Plans

For each major functional area, a plan has been developed to provide initial product identification, explain the need for the products and sub-products that will be developed in the functional area, identify inter- and intra-project dependencies, define the rationale for providing these products, and provide written documentation of functional area product development. For preparation of the PIR, refer to Part 7.5 Contracting and Acquisition.

7.1 Advanced Formulation and Planning

The purpose of the advanced plan formulation is to affirm, reformulate or modify a project that was descried in the Restudy. All planning analyses including economic, environmental, water quality, flood protection, real estate and plan formulation conducted during pre-construction design studies will be documented and included in the Project Implementation Report. The Project Implementation Report will be the vehicle to identify, quantify and attempt to resolve the uncertainties surrounding the cost or performance of each major project. These uncertainties are not limited to hydrologic performance of the specific project, but also include the uncertainties surrounding the expected ecosystem response to the project. A clear description of the expected outcome of each project will be included in the Project Implementation Report. The culmination of this formulation will result in the preparation of two PIR's that will include integrated NEPA documentation.

The USACE planning process consists of six steps defined in the *Principles and Guidelines* (P&G) *for Water and Related Land Resources*. The process identifies and responds to problems and opportunities associated with the study objectives and specific Federal, state, and local concerns, and culminates in the selection of a recommended plan. This process involves a systematic approach to making determinations at each step so that the interested public and decision-makers are fully aware of the basic assumptions employed, the data and information analyzed, the areas of risk and uncertainty, the reasons and rationales used, and the significant implications of each alternative plan.

The assigned USACE Project Manager & Planning Technical Leader and the SFWMD Project Manager will accomplish planning technical leadership of the execution of the advanced plan formulation. Tasks will include preparation of work orders, specific work requests, overseeing the timely completion of study tasks, and monitoring schedules and funding. This includes: the preparation of correspondence required to initiate and conclude

study coordination with Federal, state, and local agencies; preparation and presentation of briefings, workshops, and meetings with Federal, state, and local officials, state agencies, and the public; and coordination and dissemination of review comments on the completed products and draft PIR. Management of the PDT, during the PIR phase, will be an ongoing responsibility of the planning technical leader and SFWMD project manager, i.e., scheduling meetings, identification of and tracking the major work tasks to be completed, and coordination with team members on the development of study products.

The PIR's will serve as the basis for obtaining Congressional and state approvals/authorization of the plan components determined to be feasible and cost-effective. Because the documents must receive Congressional and state approvals, it is imperative that the process described in the P&G and outlined below is employed.

Step 1 -Identify Problems and Opportunities

Initial study efforts will involve problem and opportunity identification, development of planning objectives, and identification of constraints. This effort will refine the problem identification process performed for the scoping phase and elaborate on problems and opportunities specific to the study area. As part of this effort, public concerns are identified; technical analyses are conducted to investigate the public and scientific concerns; and the planning objectives and constraints are developed.

Step 2 -Inventory and Forecast Conditions

This step includes developing an inventory and forecast of resources and conditions (e.g., physical, demographic, economic, and social) within the study area relevant to the identified problems and opportunities. This information will be used to identify the existing and future "without-project "conditions to which alternative plans will be compared and evaluated in terms of the extent to which they meet the planning objectives. Also included in this effort are the identification of data needs, the collection of data, and the development of models to be used in the subsequent analysis of plan alternatives.

For evaluation purposes, the future "without project" condition assumed for this study is expected to include CERP components and critical projects, the Lake Okeechobee Water Supply and Environmental regulation schedule, recommendations identified in several water supply plans conducted by SFWMD, local government comprehensive plans, and projects that are planned for implementation by local governments. CERP components and critical projects will be incorporated into the "without project " condition

based on detail of design at the time that the "without project "condition is defined.

Step 3 -Formulate Alternative Plans

Alternative plans shall be formulated to identify specific ways to achieve planning objectives within constraints for the purpose of solving the problems and realizing the opportunities identified in Step 1. These plans will be formulated through public scoping and by the PDT. Plan formulation is a dynamic process with various steps that can be iterated one or more times. The resultant alternative plans will become more refined through additional development and through subsequent iterations.

Step 4 - Alternative Plan Evaluation

Four accounts are established in the P&G to facilitate the evaluation of alternative plans. Contributions to National Economic Development (NED) are increases in the net economic value of the national output of goods or services (i.e. flood damage reduction, water supply, and recreation), expressed in monetary units. The Environmental Quality (EQ) account displays non-monetary effects on ecological, cultural, and aesthetic resources including the positive and adverse effects of ecosystem restoration plans. Calculation of both NED and EQ is required. The other two accounts, which are discretionary, are the Regional Economic Development (RED) account and the Other Social Effects (OSE) account. The RED account displays changes in the distribution of regional economic activity (i.e. income and employment). The OSE account contains qualitative outputs such as urban and community impacts; life, health, and safety factors; displacement; energy requirements and energy conservation; and long-term productivity. The evaluation process includes assigning social values to the plans using technical information gathered for comparison of plan alternatives. Additional categories of effects determined to be institutionally, publicly, or technically recognized as important will be considered and taken into account in the decision-making process.

USACE planning policy requires that the plan, which maximizes NED benefits, shall be selected as the recommended plan unless the Secretary of the Army grants an exception when there are overriding reasons for selecting another plan. The USACE ecosystem restoration program is unique in the fact that it offers an objective that is not NED-oriented. For ecosystem restoration projects, analysis of incremental benefits and incremental costs are utilized. This helps with the selection of a plan that reasonably maximizes ecosystem restoration benefits, compared to costs. An ecosystem restoration project must be justified on the basis of its contribution to restoring the structure and function of a degraded ecosystem when compared to the costs of the project.

For projects that produce both economic and ecosystem restoration benefits, the plan that maximizes the sum of net NED and National Ecosystem Restoration (NER) benefits and offers the best balance between the two Federal objectives should be selected. This is known as the Combined NED/NER Plan. The LOWP will likely result in a project that produces both NED and NER benefits. One key element in the evaluation of multiple purpose projects is the potential need for trade-off between the two outputs. In some cases, more of one type of output can only be obtained by accepting less of another type of output. In these cases, trade-off between NED outputs and NER outputs are permissible, and should be made as long as the value of what is gained exceeds its implementation cost plus the value of what is foregone.

The evaluation of effects is a comparison of the "with-project" and "without-project" condition for each alternative. First, an assessment of each plan alternative will be made to quantify plan effects. An appraisal process will then be utilized to assign significance and value to the effects measured in the assessment phase. This evaluation of plan alternatives will incorporate four general tasks. The first task is to forecast the most likely "with-project" condition expected under each alternative plan. The second task is to compare each "with-project" condition to the "without-project" condition and document the differences. The third task is to characterize the beneficial and adverse effects by magnitude, location, timing, and duration. The fourth task is to identify the plans that will be further considered, based on a comparison of the adverse and beneficial effects and the evaluation criteria.

As specified in the P&G, the criteria to be used in the appraisal process include a plan's completeness, effectiveness, efficiency, and acceptability. Completeness is the extent to which a given plan provides and accounts for all necessary investments or other actions to ensure realization of the planned effects. Effectiveness is the extent to which a plan alleviates the specified problems and achieves the specified opportunities. Efficiency is the extent to which a plan is the most cost-effective means of alleviating the problems and realizing the opportunities. Acceptability is the workability and viability of the plan with respect to acceptance by state and local entities and the public and compatibility with existing laws, regulations, and public policies. Each alternative plan will be evaluated against these criteria to measure its relative success in meeting the criteria.

Through qualitative analysis and public workshops, the plans will be screened to identify the most viable components for detailed study. Results of the qualitative screening effort will be presented in a public workshop format. This process will ensure that the plans to be evaluated are consistent

with local interests and perspectives with regard to wetlands, fish and wildlife conservation and restoration, economic development, comprehensive land planning, maintenance of agricultural and urban water supplies, and flood control. This effort will be extremely important to the process of developing the components and plan alternatives to be evaluated in detail.

Computer Modeling will be used for detailed design and environmental output evaluation purposes. Hydrologic model development, environmental model development, water quality analyses, and water supply analyses will be required to refine alternative plan formulation. Cost-effectiveness and incremental cost analysis will be used to compare different outputs resulting from the various levels of expenditures.

During the comparison of plan alternatives, the differences among the plans will be examined, weighed, and traded-off. Performance measures will be identified for the goals and objectives identified in the PMP and during refinement of the problems and opportunities. The performance measures will be utilized to identify the differences in performance of the various alternatives that are assessed. The basis for the performance measures, trade-off actions, and weights for the various plan effects will be determined through a combination of input from the public, professional judgment by the PDT, and performance measures identified by RECOVER. Public input will be obtained throughout the course of the study through an extensive public involvement process, which includes opportunities for public workshops, community meetings, media opportunities, publications, and other public outreach activities. In addition, the USACE and SFWMD have created public outreach coordinators and teams to further promote public involvement and participation.

The evaluation of plans will yield information for use in the decision making process as well as the iterative plan formulation process. Plans will be evaluated according to their costs, environmental benefits, social effects, effects on significant resources (such as endangered species), ability to meet planning objectives, and other findings. During plan evaluation, the results will be analyzed to determine which types of actions provide the most benefits as well as to identify which actions achieves compliance with statutory requirements. A plan-effects matrix will be developed to illustrate the relative effects of plan alternatives in meeting the stated planning objectives for the decision-makers. This decision matrix will be useful to planners, members of the public, and decision-makers alike. As discussed above, many activities (including workshops, meetings, etc.) will involve identifying items, which will be addressed on the decision matrix. This effort will ultimately identify the plan, which provides the optimum level of benefits to meet the study objectives.

Step 5 -Compare Alternative Plans

Plans shall be compared against each other with emphasis on the outputs and effects that will have the most influence in the decision-making process. These include monetary and non-monetary benefits and costs. The output of the comparison step shall be a ranking of plans.

Step 6 -Select a Plan

The culmination of the planning process is the selection of a recommended plan. One alternative plan will be selected for recommendation from among all those that have been considered. It is likely that the recommended plan will be comprised of features from multiple alternatives that were evaluated. The criteria for selecting the recommended plan differ, depending on the type of plan and whether project outputs are NED, NER, or a combination of both. For projects that produce both NED and NER benefits, the plan shall attempt to maximize the sum of net NED and NER benefits and offer the best balance between the two Federal objectives.

Report Preparation - The PIRs will consist of a Main Report with an integrated SEIS and numerous Technical appendices. The PIR will be prepared by an A/E and will be in compliance with *ER 1105-2-100*, *Planning Guidance.* These reports will be a complete decision-making documents and, as such, will include a complete presentation of problem identification and plan formulation and evaluation. The PIRs shall be based on all studies and investigations conducted and also from published reports applicable to the study area.

The Main Report, which summarizes the study finding(s) and recommendation(s), will be direct, concise, and written in a user-friendly style using sufficient graphics, illustrations and photographs to convey the information. The SEIS will be integrated with the Main Report and will conform to the regulations contained in *ER 200-2-2*, *Policy and Procedures for Implementation of NEPA*, dated 4 March 1988.

The technical appendices will document in detail technical information developed for the study and the evaluations conducted to support the conclusions of the study. The final versions of each appendix will be submitted to the Planning Technical Leader in an electronic format compatible for inclusion in the final document.

Draft PIRs – The SFWMD will be the lead agency for this phase of work. A Draft PIR will be prepared by an A/E. There will be evaluation points during the process to evaluate the work progress. This activity involves preparing the draft integrated PIR, including the SEIS. This activity will include the effort necessary to compile the data, write the PIRs, and prepare all plates necessary

to document development of evaluation tools, outputs, and evaluation results. Modeling, results, evaluations, and other data will be compiled and incorporated into the draft PIR appendices. The report will include, but is not limited to, the following components: Main Report; Plan Formulation; Environmental Evaluation Analysis Appendix; Scoping Report; Section 404(b)(1) Evaluation Report; Fish and Wildlife Coordination Act Report; Appendix; Hydraulics and Hydrology Appendix; Engineering, Design, and Cost Estimate Appendix; Socio-Economics Appendix; Real Estate Supplement; Local Cooperation and Financial Analysis; Geotechnical Analysis; and draft Archeological Report. The draft PIR will be released for public comment.

Final PIRs – This portion of the PIR will be prepared by the USACE. This activity includes the tasks necessary to produce a final integrated PIR and SEIS. Any changes necessary will be incorporated to respond to comments received during the review period. Other activities will include preparing responses to USACE and state higher authority and incorporating the results of the Feasibility Review Conference. The report will include, but is not limited to, the following components: Main Report; Plan Formulation; Environmental Evaluation Appendix; Public Views and Comments Report; Section 404(b)(1) Evaluation Report; Fish and Wildlife Coordination Act Report; Biological Opinion; ROD; Hydraulics and Hydrology Appendix; Engineering, Design, and Cost Estimate Appendix; Socio-Economics Appendix; Real Estate Supplement; Local Cooperation and Financial Analysis; Geotechnical Analysis; and final Archeological Report. A draft Chief of Engineers Report for submittal to Assistant Secretary of the Army for Civil Works will be prepared.

7.2 Engineering and Design

The engineering and design plan will be provided by an A/E contracted by the SFWMD. This plan will be submitted to the U.S. Army Corps of Engineers for review and comment at appropriate stages of completion (35% and 100%). This plan will provide descriptions of all engineering and design efforts necessary to implement the project. The scope of required surveys and aerial photography will be determined jointly between the SFWMD, it's designated A/E and the USACE and requests will be prepared by the SFWMD or it's designated A/E. The survey data will be reviewed for impacts of the project on existing utilities, and required relocations will be determined. Alternative plans developed by the A/E and SFWMD will be investigated and design input will be provided to the A/E's Cost Engineer to develop preliminary MCACES construction cost estimates for Plan Formulation. The A/E shall develop structural designs for elements of the selected/recommended plan (levees, canals, spillways, and pump stations, etc.). Real estate requirements will be determined by the A/E, including rights-of-way and temporary construction easements. The A/E shall provide engineering input required

for NEPA documentation and permits. The USACE Engineering Division and SFWMD Real Estate, Engineering, and Construction Division will coordinate their input for the Engineering Appendix to the PIR. The USACE Design Branch will provide input for the Engineering Appendix, including write-ups and plates, to form the elements of project design considerations and construction procedures. Responses to ITR and interagency review comments will be provided, and the Engineering Appendix will be revised as required.

7.2.1 Hydrology and Hydraulics Studies

This section will be revised to place more emphasis on identifying patterns of flows along with the quality of the flows to determine what capacities for capture and treatment would be necessary to meet water quality goals for discharge to Lake Okeechobee. Volumes captured, quality before and after treatment of the captured water, volumes bypassed and the quality of that water would need to be evaluated.

This account describes the investigative effort to collect and analyze the hydrologic and hydraulic data needed to formulate, evaluate and optimize plan alternatives. The tasks will involve collecting existing hydrologic and hydraulic data; selection and/or development of appropriate hydrologic models; and modeling of existing conditions, future without project conditions, and ecosystem restoration alternatives.

Computer simulation models will be used to evaluate alternative plans for environmental restoration and mitigation for flood control in the study area. The watershed modeling will consist of a hydrologic and hydraulic analysis of the north and south watersheds within the study area. Existing hydrologic data will be evaluated to determine the model simulation period to be used in the feasibility study modeling efforts. Available data and modeling tools will also be evaluated for sufficiency.

The evaluation of existing and future conditions within the study area will be accomplished using both hydrologic and hydrodynamic models. Comparison of model output representing current and future conditions will be used to establish the impact of changes to the existing system. The output from the models for the existing conditions will be compared to output from the model runs representing future alternatives. This comparison will identify the environmental and flood control benefits/impacts associated with implementation of the selected plan.

The future "without project" condition refers to no changes to existing policies and plans. The CERP is an existing plan and is part of the “without project”

condition. “Without project” therefore describes what is expected to happen if the CERP plan is implemented. The "without project" condition is the same as the "no action" alternative that is required to be considered by the Federal regulations implementing the *National Environmental Policy Act of 1969 (NEPA)*.

Hydrology Review/Coordination - This task includes a review of all existing hydrology data for adequacy of basin specific data needed for hydrologic and hydraulic model efforts for this feasibility study. This task also includes the effort necessary to maintain coordination between SFWMD, USACE, and the A&E contractor during the model effort.

Support for Development of the Scope of Work for the A&E Contract and Contract Coordination - This activity includes the effort required to provide Hydrology and Hydraulics input to develop the Scope(s) of Work and contract coordination.

Watershed Assessments - Key information to be collected for the selected watersheds will include: 1) a complete basin description (including drainage features, hydrogeology, topography, soils, and land use); 2) delineation of sub-basins; 3) an inventory of existing land management activities (including all water management systems and their regulatory status); 4) analysis of existing water quality data to provide an assessment of current conditions and trends; and 5) basin scale analysis of the level of flood control provided by existing facilities and operations. Watershed assessments will provide basin specific information needed to meet the data requirements of the hydrologic modeling, such as: Hydrologic Simulation Program-Fortran (HSPF), MIKE SHE, ModFlow, ModBranch, UNET, HMS or other equivalent watershed model.

Rainfall-Frequency Analysis - Appropriate methodology will be used to determine the relationships between rainfall, runoff, and frequency for the study area. Design storms will be developed for 2- to 100-year frequencies and 30-minute to 24-hour duration periods, the Standard Project Flood, and probable maximum precipitation. This data will be used to perform design analysis of plan alternatives.

Develop Hydrologic Models - Numerical models capable of simulating the surface water management plan alternatives for the basins in the study area will be developed and used to evaluate impacts of the alternatives. Model output will be used to evaluate the hydrologic effects of the various plan alternatives for comparison.

Groundwater/Surface Water Model Development and Application - In order to adequately evaluate the complex groundwater/surface water

interaction in alternative plans, accurate groundwater/ surface water models are needed. This is true in south Florida where groundwater/surface water interactions are significant in water movement issues. High-resolution integrated groundwater/surface water models can be used to evaluate project-level issues of storage, seepage, flows, etc.

Coordination of Modeling Efforts with RECOVER – PDT/H&H/Modeling Team will provide input necessary for RECOVER evaluation of alternative plans.

Performance Measure Development – Performance measures related to potential changes to existing level of flood protection, operational flexibility, and efficiency of storage capacity of components will be developed.

Hydraulic Design Final Alternatives - Hydraulic models will be run using various floods for which historic hydraulic data is available. Programs such as Mike11, HEC UNET, or similarly documented models have been used to perform hydraulic design for plan alternatives in other areas of CERP. These will be reviewed and the appropriate models will be selected to use for quantitative simulations. Flood elevations versus frequency relationships will be developed. Hydraulic design will be accomplished in sufficient detail to adequately obtain costs of reservoirs, STA's, canals, seepage control facilities, pump stations, spillways, earth plugs, earth berms, reservoir outlets, and other water control structures as needed.

Operations - USACE and SFWMD will develop operational criteria for the project features that will establish a framework for the successive water control plans.

H&H Participation in the TRC - Prepare for and attend Technical Review Conference (TRC). Preparation should include activities necessary to be responsive to anticipated TRC questions/comments. Respond to comments resulting from TRC.

Hydrology and Hydraulics Write-Up for Draft Report - This activity includes preparation of the narrative report which documents all hydrology and hydraulics studies performed for the PIR. Results of the hydrologic model evaluations and other hydrologic investigations will be compiled and incorporated into the draft interim PIR in a Hydrology and Hydraulics appendix. Included in this activity is the effort necessary to compile the data, write the report, and prepare all plates necessary to document model development, output, and evaluation.

H&H Participation in the FRC - Prepare for and attend FRC. Preparation should include activities necessary to be responsive to anticipated FRC questions/comments.

Finalize Hydrology and Hydraulics Write-up - This task includes the effort required to address all comments generated at the FRC. This activity also includes the effort required to finalize the hydrologic model investigation documentation for the final PIR.

Support for Development of PMP - This activity includes the effort required to provide H&H input to the update of the Project Management Plan for project modifications recommended by this PIR. This includes the effort required to develop the time and cost estimates to perform pre-construction, engineering, and design (PED) studies recommended in this PIR.

7.2.2 Geotechnical/Hydrogeologic Investigation and Analysis

The objective of this activity is to investigate and analyze subsurface material and foundations at project sites for the purpose of selection and design of project features. Geotechnical investigation and analyses may be required for any of the following project features: reservoirs, STA's, structures, levees, canals, wells, and other plan components determined feasible and cost effective. Tasks associated with this activity are outlined below.

Perform a Detailed Hydrogeologic Literature Search - Gather bore hole logs, geophysical logs, existing public reports, academic studies, and/or architectural and engineering studies pertinent to the study area. Once obtained, the existing data will be summarized into a digital database. Regional geologic and hydrogeologic cross-sections will be developed from this information, and all geotechnical designs for the qualitative screening of alternatives will be based on this data.

Geotechnical Design/Input for the Initial Screening - For the preliminary array of alternatives, the geotechnical design parameters for project features will be based on the information obtained above.

Geotechnical Design/Analyses for the Final Array of Alternatives – The following types of geotechnical analyses may be performed for project features included in the final array of alternatives: slope stability analyses, settlement analyses, finite-element seepage analyses, and evaluation of foundation conditions for structures. The results of geotechnical analyses will be provided to the project engineers for use in the design of project features and evaluation of their effectiveness in meeting the planning objectives.

Field Investigations - Geotechnical field exploration will be needed to support the engineering and design studies necessary for the design of project features. Once the locations and/or general alignments of the project features have been identified, field investigations will be initiated in order to validate the preliminary designs and better define the cost of project features. Field investigations may include core borings, recharge tests, slug tests, and pump tests. Any additional field exploration required for subsequent engineering and design studies will be identified.

Laboratory Analysis - This effort includes the costs for laboratory analysis of samples collected during field investigations. Laboratory testing may include the following: grain size analysis, Atterberg limits, compaction testing, consolidation tests, direct shear tests, permeameter tests, and triaxial tests. Results from this effort will provide data on field conditions for the engineering analysis, design, and project costs associated with specific features.

Groundwater Modeling Support - Provide hydrogeological and geotechnical data pertinent in defining the aquifer characteristics and groundwater movement in support of the hydrologic modeling. This effort will also include output review and any other support required to complete the modeling. Compile a well log database and conduct geophysical surveys to produce a regional hydrostratigraphic characterization of the project area. Develop real-time continuous potentiometric surface maps. Develop regional hydraulic properties map (hydraulic conductivity, leakance, and canal/aquifer seepage term).

Geotechnical Participation in In-Progress Reviews (IPR) - Prepare for any IPR's and provide timely responses to comments resulting from the IPR's.

Geotechnical Write-up for Preliminary Draft FS Report - All information will be compiled and put in report format. The report will include the core boring logs (both historic and new), geologic interpretation, results of all analyses, and laboratory test results.

Finalize Geotechnical Write-up - Finalize the geologic and geotechnical portion of the Feasibility Report. This effort should include the preparation for any review conferences and responses to comments resulting from these conferences.

Provide Input to Project Management Plan (PMP) - Develop the hydrogeologic and geotechnical scope of work, including time and cost estimates, for the PMP.

7.2.3 Hazardous, Toxic, and Radioactive Waste Assessment (HTRW)

The objective of this activity is to identify, investigate and assess Hazardous Toxic and Radioactive Waste (HRTW) and its potential impacts in the study area. The results of the HRTW assessment conducted during the feasibility study phase should provide rationale for proceeding into the project implementation phase.

Civil works project funds are not employed for E-HTRW related activities except as provided in ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, or otherwise specially provided in law. E-HTRW sites should be avoided whenever practicable during project implementation. This can be accomplished, during the PIR phase and before any land acquisition begins, by early identification of E-HTRW sites and potential E-HTRW impacts.

Plan formulation, selection, and project alternative design may be substantially influenced by the presence of E-HTRW in the LOWP study area. It is therefore imperative that E-HTRW assessment be conducted early in the PIR phase in order to facilitate plan formulation and selection. Alternative plans may consider avoidance of E-HTRW sites as a possible response. At least one alternative plan should be formulated to avoid E-HTRW sites to the maximum extent possible, consistent with LOWP study area objectives. A preliminary cost estimate of required E-HTRW response actions will be needed for each alternative plan in order to make a reasoned choice among alternative plans.

In general, E-HTRW assessment involves the following components: (1) archive research and site reconnaissance to identify and select E-HTRW sites in the LOWP study area which could potentially impact project implementation, (2) water quality and site characterization to assess the nature and extent of E-HTRW contamination at select E-HTRW sites to the degree necessary to determine the potential WQ and E-HTRW impacts on project implementation, (3) qualitative risk assessment of potential impacts to human health and the environment in the absence of environmental response action, to the degree necessary to determine potential impacts to project implementation, (4) E-HTRW response alternatives analysis, (5) HTRW response cost estimate, (6) coordination with sponsor, and (7) preparation of the E-HTRW appendix to the PIR. The following paragraphs describe each of these components.

Archive Research & Site Reconnaissance - Identification of E-HTRW sites in the LOWP study area will require archival research and site

reconnaissance. This may involve database searches or interviews with Federal agencies (Environmental Protection Agency (EPA)), U.S. Army Corps of Engineers (USACE)), State agency (Florida Department of Environmental Protection (FDEP)), or local regulatory agencies (South Florida Water Management District (SFWMD)), County Environmental and Health Departments, etc.). This may also involve analysis of aerial photographs, field reconnaissance, site inspection, and analysis of building and utility layouts. Example of E-HTRW sites include sites which generate E-HTRW contamination subject to the Resource Conservation and Recovery Act, E-HTRW contaminated sites listed on EPA's National Priority List (Comprehensive Environmental Response, Compensation and Liability Act sites), Defense Environmental Restoration Program for Formerly used Defense Sites contaminated with E-HTRW or ordnance, EPA Brownsfield sites, petroleum-contaminated sites subject to EP's Petroleum Cleanup Program, E-HTRW Treatment, Storage and Disposal facilities, landfills, fire protection training areas, agricultural areas (i.e. Cattle Dip Vat) with potential arsenic, pesticide/herbicide contamination, mining areas, transformer storage areas, bulk product facilities, marine fueling facilities, wood treatment/preserving facilities, dredge disposal sites, dry cleaning facilities subject to DEP's Dry Cleaning Solvent Cleanup Program, and land or water bodies adjacent to the above-listed sites. This list is not comphrensive.

Once HTRW sites within the study area have been identified as those sites which could potentially impact project implementation some of the factors which should betaken into consideration include: location of the E-HTRW site within the LOWP study area (close in proximity to land associated with project alternatives or critical project areas, or remote location), status of the E-HTRW site (has the site been previously investigated, characterized, remediated, etc), and the degree of risk that the HTRW site may pose to human health and the environment.

Water Quality Characterization – Includes a review of the available characterization of the water within Lake Okeechobee and its tributaries/estuaries. Water samples will be collected and analyzed as required by the USEPA and FDEP to understand the variability between wet and dry seasons. The water will be analyzed for applicable state and/or Federal standards.

Site Characterization – To determine the potential impact that a E-HTRW site may have on the project implementation, a characterization and extent of the contamination may be necessary. This may include review and analysis of available site documentation (environmental impact statements, environmental assessment reports, etc.), study of the site's physical

characteristics (topography, geology, hydrology, hydrogeology), sampling (soil, groundwater, sediment, surface water), and identification of source areas. The level of detail of the site characterization should be sufficient to determine the vertical and horizontal extent of E-HTRW contaminants in relation to alternative plan features and adjacent lands potentially impacted by the features.

To avoid potentially high costs of site characterization through multiple sample collections and laboratory analyses, available site data should be researched and utilized to the degree possible. Depending on the type and status of a given E-HTRW site, a sampling program may already be planned or underway under the authority of a non-Civil works program. Additionally, the decision to sample a site should not be made without first determining the landowner's responsibility and intent to characterize his land, determining if the site can be avoided in the project design, and determining the Federal Government's potential interest in acquiring that land.

Risk Analysis - To determine potential impacts to human health and the environment at sites determined to potentially impact project implementation, a qualitative risk analysis may be necessary. Components of the qualitative risk analysis include determination of contaminant release mechanisms, mobility of contaminants, pathways and exposure routes, toxicity of contaminants, potentially exposed populations, as well as a determination of the non-numerical risk or potential adverse health effects for the identified potential receptors.

HTRW Response Alternatives Analysis - This analysis shall identify and evaluate alternatives to respond to verified HTRW contamination that cannot be avoided in the project design. Activities conducted may include additional sampling and analysis to further characterize a site if needed, identification of potential response alternatives, screening of response alternatives, and cost analysis of response alternatives. Examples of response alternatives are; "no further action", monitoring only, institutional controls, source removal, on-site containment or immobilization of HTRW, treatment, or obtaining a waiver of environmental standards. During screening and analysis of the proposed response alternatives, a comparative evaluation should be conducted using the following criteria: (1) technical feasibility. (2) public health effects, (3) environmental effects, (4) institutional effects (eg. effects of Federal, State and local standards), and (5) cost.

The recommended response action for a given E-HTRW site in the LOWP study area will be selected by determining which response alternative best meets each of the five evaluation criteria. The response action shall be selected with full coordination with the appropriate Federal, State, and local

regulatory agencies. The evaluation and selection of the response action will be documented as an appendix to the Project Implementation Report. The appendix will document how each alternative weighs against the evaluation criteria, and how the selected response action best meets the evaluation criteria.

E-HTRW Response (RD, RA, O &M) Cost Estimate – A cost estimate shall be developed for performing remedial design (RD), remedial action (RA), and Operation and Maintenance (O & M) for the response action(s) selected during the E-HTRW Response Alternative phase. RD, RA and O & M cost estimates shall be developed to the same level of detail as other project features, utilizing existing site data to the degree possible. The cost of actual E-HTRW response activity will not be considered as project cost in determining economic feasibility of the project unless it is without a local sponsor. The cost of the E-HTRW response activity, however, may be an important factor for a local sponsor making a decision concerning the LOWP project, and thus should be estimated during the PIR (feasibility) phase.

Coordination with the Local Sponsor – Scoping, execution, and findings of the E-HTRW assessment conducted during the PIR (feasibility) phase are to be coordinated with the local sponsor. Should there be a known E-HTRW problem identified by the assessment, a letter of intent for the local sponsor to fund the response action alternative should be initiated. The letter should state the local sponsor has been designated as the "responsible party" and as such is responsible for all costs associated with the remediation of the E-HTRW. The project authorization document and the post-PIR (feasibility) phase or update to the Project Management Plan should include language describing how E-HTRW response actions will be coordinated with project construction. Construction should not be undertaken on land in the E-HTRW impacted area until response activities have been completed.

E-HTRW Appendix – Results of the E-HTRW assessment will be fully documented in the HTRW Appendix to the PIR (feasibility report). This includes documentation of; (1) E-HTRW characterization and assessment, (2) E-HTRW risk analysis, (3) E-HTRW response alternative analysis, (4) E-HTRW cost estimate, and (5) coordination with local sponsor. If E-HTRW is identified, the PIR (feasibility report) will describe actions taken toward avoidance or response, and what non-Federal landowner is named the "responsible party", if applicable. Documents for innocent landowner defense will be retained.

7.3 Real Estate

The real estate analyses will include a determination of the estates required for the lands to be acquired for the project, an appraisal of the costs of lands and damages, and preparation of a plan for acquisition of these lands. Other tasks include an analysis of physical takings, attorney's opinion of compensability, obtaining rights of entry for various field collection activities, and providing input to the Project Cooperation Agreement (PCA) and PIR. This activity includes all written memoranda, opinions, database development reports and other documents provided by Real Estate personnel as required in support of feasibility phase planning efforts.

Obtain Rights of Entry – According to specifications to the contract, the contractor should obtain access/rights-of-entry. However if unsuccessful, notification to real estate by a request for rights of entry by section, township, and range parameters, permission will be obtained from landowners to temporarily use his/her land for a specified time and purpose. These will be obtained for purposes of environmental investigations, cultural assessments, core sampling, surveys, explorations, etc.

Ownership Information - Upon notification of alternative feature description and location by section, township, and range parameters, the following data for areas under consideration as project features will be obtained:

- Tax maps and public right-of-way maps
- List of property owners
- Tax rolls including value, structure, type, etc.
- Zoning information
- Last search of records for each parcel
- Anticipated mineral extraction and determination if such activity is permitted by law
- Identification of all structures potentially impacted that are occupied and may be removed due to project implementation
- Identification of all known public utilities located within the proposed project area that may require relocation
- Identification of sponsor acquisition costs and real estate administrative costs associated with implementation of each alternative
- Location maps (city or county) of proposed construction areas including material disposal areas

Preliminary Real Estate Cost Estimates - Prepare lands, easements, rights-of-ways, relocations and disposal areas (LERRD) preliminary cost estimates

for multiple components for the preliminary assessment of project alternatives during the plan formulation stage of the study. This will require a similar method of estimating costs performed during the Project Management Plan (PMP). The preliminary cost estimates along with the aforementioned ownership information will be compiled in the Geographic Information System (GIS) database as polygon attributes for use in the evaluation analyses.

Section Corner Survey - This survey is required to establish state plane coordinates for sections and townships within the study area for real estate mapping purposes. This data should be in Transverse Mercator Projection, Florida East Zone using 1927 Datum. A Global Positioning Station will be used. It is assumed that other data, provided by the state, will also be available. The survey data will be incorporated into the GIS database and used to map property boundaries and ultimately develop real estate acquisition costs for alternatives.

Real Estate Acquisition Maps - Prepare an initial set of maps and drawings, utilizing the GIS database developed for this task, that delineate the real estate acquisition lines based on technical design drawings developed during the feasibility phase. This activity is dependent upon receipt of the footprint of project features and tax maps followed by a coordination meeting with the study manager to assure all project features are identified including temporary construction areas, road access, borrow/disposal areas, etc. These maps will reflect the minimum real estate required for project purposes.

Physical Takings Analysis - This analysis will result in a written legal opinion as to whether flooding induced by construction, operation, or maintenance of the proposed project will result in a taking of an interest in real property for which just compensation must be paid to the owner. The opinion must describe the analysis, to include hydrologic data incorporating depth, frequency, duration, velocity, and extent of induced flooding based on economic data, as well as relevant state and Federal law, and present a conclusion on the takings issue.

Relocations Analysis - After a determination through engineering design of which facilities must be relocated, including roads, railroads, pipelines, utilities, bridges, and cemeteries, a preliminary legal opinion on whether a substitute facility is required will be documented. The opinion makes findings on whether the owner has a compensable interest, whether the owner has a legal duty to continue to maintain and operate the facility/utility, and whether federal law requires the provision of a substitute facility rather than mere payment of market value for the property acquired. The preliminary legal opinion differs from the final legal opinion only in its

acceptance as fact of the owner's statement of its interest in the property, without a search of property records. A baseline cost estimate must be developed for the relocations to include an engineering cost estimate for the performance or construction of the relocation and the value of the land. The Real Estate Supplement (RES) will include a statement as to whether the Federal government, the local sponsor, or owner will be responsible for the relocation and acquisition of new rights-of-way, the costs for relocation, and land to be acquired allocated to each entity.

Gross Appraisal - This task includes activities necessary to complete a detailed, supported appraisal of the collective real estate requirements and impacts of the recommended plan as required by *ER 405-1-12*. The Gross Appraisal must be of sufficient detail to provide an accurate cost estimate sufficient for Congressional authorization. Review and approval of the Contracting and Acquisition Gross Appraisal Report is accomplished concurrently with the draft PIR. The Gross Appraisal will be submitted concurrently with the draft PIR and is dependent upon receipt of the final recommended plan including real estate maps with project features, estates to be appraised, tax and ownership information, zoning and land use maps.

Real Estate Supplement (RES) - The RES to the PIR will outline the minimum real estate requirements for the proposed project as required by *ER 405-1-12.* It will contain a description of the area; the acreage and proposed estates, including non-standard estates, and justification for the use of non-standard estates; a discussion of any land owned by the Federal government, the local sponsor, or any public entity; a discussion of the local sponsor's ability to acquire LERRD; a discussion of mineral activity, if any, and the attitude of landowners; at least a preliminary assessment of facilities/utilities to be relocated; and any other relevant real estate information appropriate for the project.

This activity also includes development of a detailed cost estimate for the recommended plan that will be input for the MCACES (engineering) cost estimate. This baseline cost estimate will be developed from the Gross Appraisal and will include other costs such as *Public Law 91-646* relocations, administrative costs, and contingencies.

Draft Project Cooperation Agreement (PCA) and Post-PIR Phase PMP Input - This activity includes development of data necessary to support other documents pertinent to the project including, but not limited to, the post-PIR phase PMP and the draft PCA. For these documents, a detailed schedule of land acquisition will be developed.

7.4 Contracting and Acquisition Plan

This section describes the contracting strategy that will be utilized for implementation of the PIR phase of the project. Contracting and acquisition strategies to be utilized during design and construction phases will be developed in subsequent updates of this PMP.

Contract specific acquisition strategies will be developed for each individual contract to be advertised and awarded. Procurement statutes, regulations and procedures applicable to the procuring Agency (USACE or SFMWD) will dictate the acquisition process. Factors to be considered in determining the specific acquisition strategies include but are not limited to technical complexity of the work, environmental considerations/constraints, construction schedules and magnitude of construction. Socioeconomic statutes, regulations and procedures applicable to the respective procuring Agency will be applied to each individual acquisition. Acquisition strategies will be fully staffed through the Project Delivery Team, the Design Coordination Team and appropriate procuring Agency approving Officials.

A detailed breakout of all contracting and acquisition activities, including estimated costs, schedules, and durations is included in Appendix I.

7.4.1 PIR Contract

An Architect/Engineer (AE) contract will be awarded for technical support in preparation of the Watershed Assessment and the PIR/EISs for the Taylor Creek/Nubbin Slough Project and the Lake Okeechobee Projects. The SFWMD will act as the procuring agency for this contract. The acquisition process will follow the requirements of the Consultant's Competitive Negotiation Act (CCNA) and all-applicable policies and regulations of the SFWMD. The procurement will comply with Governor Bush's One Florida policy to insure that all practicable steps are taken to obtain adequate participation of Minority and Women Owned Businesses. A scope of work for the contract, with milestones, will be reviewed and approved by the USACE prior to issuance of the RFP. The panel for review and ranking proposals will consist of USACE and District personnel and the USACE will be an equal partner in management of the contract.

7.4.1.1 Contract Scope and Work Plan

A scope of work will be prepared and a Request for Proposals will be released in accordance with the CCNA process. The scope of work will include work scopes, costs, and schedules for all proposed contract products that are consistent with the approved PMP. The Contract will require compliance

with all applicable Federal and state regulations and policies. The Project Delivery Team will review that scope of work, monitor and guide the contractor during the project execution, and will review all deliverables. The Contractor will generally be responsible for performing all technical functions required for preparation of the following major deliverables:

- Watershed Assessment Document – describes the results and conclusion of the watershed assessment;
- Work Plan – developed at the conclusion of the watershed assessment, it will provide a detailed scope, schedule, and cost estimate for all technical support work required to support preparation of the two PIR/EISs;
- Draft PIR/EIS for the Taylor Creek/Nubbin Slough – meets all Federal and state requirements; and
- Draft PIR/EIS for the Lake Okeechobee Projects – meets all Federal and state requirements.

At the conclusion of the Watershed Assessment, the Project Delivery Team will review the Work Plan submitted by the contractor for the remainder of the PIR process. A decision will be made at that time to either continue with the work plan or terminate the contract. The decision whether to continue or terminate the contract will be based on performance of the contractor and on the adequacy of the work plan. The work plan should be consistent with the general scope, schedule, and cost estimates in the PMP.

If there is a decision to continue with the contract through preparation of the PIRs, the Contractor will be required to make 30% and 60% review submittals during the PIR process. Both submittals will serve as decision points to continue toward the final, or 95%, submittal. The final deliverable is expected to be draft PIR/EISs for both the Taylor Creek/Nubbin Slough Project and the Lake Okeechobee Projects. The draft PIR/EISs will include responses to PDT comments. After conclusion of the Contract work for each PIR/EIS, the PDT will lead the process for public and agency reviews, responses to public and agency comments, final approval of the PIR/EIS, and obtaining the Record of Decision (ROD).

7.4.1.2 Project Delivery Team Monitoring/Review

In monitoring of the work by the AE, the Project Delivery Team will provide three functions during the contract period:

- *Provide Guidance to the Contractor* - The Contractor will facilitate periodic meetings to obtain guidance in the methods, data collection, format, etc to be used in the development of contract deliverables.

- *Provide input to the Contractor* - The Contractor will facilitate a series of meetings to obtain PDT input for the development of performance measures during the Watershed Assessment and the development of the preliminary and final sets of alternative plans to be evaluated in both PIRs. Additionally, PDT members will provide any existing data or reference material that may support development of contract deliverables.
- *Review Contract Deliverables* - Prior to the release of any Contract deliverable, the Contractor will obtain and respond to comments of the PDT. The PDT shall review the Contract deliverables to insure technical adequacy and consistency with all applicable Federal and state requirements.

7.4.2 USGS Cooperative Agreement – Monitoring

A cooperative agreement will be entered into between the USACE and USGS for design, implementation, and operation and maintenance of a basin-scale monitoring system. As part of this project component, the USGS will acquire equipment and supplies for the installation and operation of the monitoring network. All procurement and acquisition will be performed by the USGS in compliance with applicable Federal acquisition regulations and policies.

7.5 Quality Control

Quality Control is the process employed to ensure the performance of a task meets the agreed-upon requirements of the customer and appropriated laws, policies and technical criteria, on schedule and within budget. An Overall Quality Control Plan (QCP), Appendix J, should be prepared for projects that, due their size or complexity, are divided into several products after the feasibility phase. The QCP will be supplemented as necessary to address each of the individual products. Overall, the QCP must provide the continuity necessary to bind all products together and reflect project decisions reached during the PIR phase. QCP supplements should be consistent with the overall QCP and should address issues that pertain to the specific product.

7.6 Permitting and Monitoring

During preparation of the PIR, individuals from the appropriate regulatory agencies (e.g., FDEP, EPA, etc.) will be participating so that potential regulatory issues can be identified as early in the process as possible. Identification of the permits that will be required for the recommended plans and a comprehensive permitting strategy will be included in the PMP update that will be prepared at the end of the PIR.

7.7 Public Outreach and Involvement

Due to the intense public, political, and media interest in the restoration of the southwest Florida ecosystem, public involvement is a critical component of the study effort. Appendix K contains a plan and a listing of the stakeholders. Two goals for public involvement have been identified:

- Gather input from the diverse groups outside of the study team to assist in problem definition and identification of opportunities and potential solutions.

- Develop relationships critical to the success of the study and the implementation of the recommendations of the study.

7.7.1 Public Workshops

This activity will consist of several workshops to gather information as well as to provide feedback to the public. The workshops should be scheduled such that they occur approximately once a year (after the initial year) to foster interest in the plan. Each workshop will be held in Okeechobee, Clewiston, and/or in different geographical locations in the study area.

Public Workshop #1 - The first public workshop will be conducted at the beginning of the Project Implementation Report (PIR) process. The purpose will be to identify important resources, problems, and opportunities as required by the *National Environmental Policy Act (NEPA).* The second purpose of this workshop will be to present the purpose and scope of the restoration plan. This workshop will be conducted as part of the initial screening process to ensure that the proposed restoration plan will be consistent with agency and local interests and perspectives with regards to wetlands and wildlife conservation, economic development, comprehensive land planning, maintenance of water supplies, flood control, and agriculture. The workshop could also include economic development opportunities connected with ecosystem restoration and water supply.

Public Workshop #2 - The second public workshop will be conducted to respond to public comment from the first workshop and educate the public on technical aspects of the plan. The workshop will provide an opportunity for the public to offer additional comment on technical issues. This workshop will be held midway during the PIR process.

Public Workshop #3 - Another public workshop will take place in conjunction with release of the final draft Project Implementation Report and will include a presentation of the plan's conclusions.

7.7.2 Community Meetings

Throughout the duration of the plan, many opportunities will be developed for the public to get information outside of formal public workshops. Civic associations, neighborhood associations, universities and environmental groups located in areas that may be impacted by the plan will provide avenues for the study team to disseminate information to the public and enhance community awareness and support. Public affairs staff will be assigned the task of preparing presentations for these purposes. Staff assigned to this task will be kept abreast of the plan's progress and issues, and make revisions to the presentations as necessary. It is expected that these presentations will be modified annually, however, when study progress or issues dictate. All tools developed for these presentations will be reviewed and revised as necessary.

Much public opinion is shaped by the interested public talking to a local "expert", such as, an employee from the USACE, SFWMD, or another agency. This activity of the public involvement plan relies on and supplements the public affairs internal information activities. These employees are valuable sources of information that can serve as community experts to discuss ongoing study progress.

7.7.3 Publications

At opportune times throughout the plan, newsletters and other information pieces will be developed to provide feedback to the public.

Written Publications – Written publications will include public notices identifying the purpose and location of the workshops, fact sheets describing study progress, and public information brochures. In addition, regular submissions to the SFWMD's monthly publications will be developed. Once special articles have been written, they can be placed in the newsletters and newspapers of local environmental groups and civic associations, when appropriate. To estimate costs of printing and mailing, it is assumed the general mailing list will not exceed 2,500.

Electronic Publications - Electronic versions of publications will be incorporated into the Internet system through the World Wide Web to facilitate greater public access to informative documents. A Web home page has been developed and is maintained for information access by the public on the Comprehensive Everglades Restoration Plan (www.evergladesplan.org) and on the SFWMD Web page (www.sfwmd.gov/org/exo/swflstudy). Information on the LOWP, including scheduled meetings, has been and will continue to be incorporated.

7.7.4 Internal Audiences

The study team will host LOWP update briefings for others in the USACE' Jacksonville office and SFWMD offices, as appropriate.

7.7.5 Media

The overall public involvement strategy must include a media plan for the restoration plan. The media not only offers a valuable resource for providing information to the public, but also is a resource for providing information to the planning process.

News Releases - News releases will be issued at the beginning of the PIR and prior to the various workshops to provide an opportunity to hold discussions with interested media representatives and explain the purpose and strategy for addressing the study objectives. It is assumed that the study will receive significant local media coverage.

Media Opportunities - The media will be invited to meet with the study team to discuss various aspects of the study in-depth. Media tours will also be arranged prior to any significant actions as a source of educating the media on the complexities of the system. Ample opportunities will be available for the media to be briefed with an emphasis on concerns and issues that may be important to their audience. When appropriate to the PIR process, special in-depth programs with local radio and television stations will be developed to ensure ample media opportunities and accurate coverage of the study. Due to the emphasis on local environmental issues, relationships with public radio and television stations in the southwest Florida market should be developed early in the study. The development of a broadcast quality video addressing the questions and concerns of the general public could be produced and broadcast on public television. Once the program has aired, duplicates could be distributed to schools, and an edited version could be used at community meetings and distributed to schools and interested community groups. Visits to editorial boards, appearances on major public affairs programming, as well as the development of guest editorials will be part of the campaign to reach the public through media outlets. This will provide an opportunity to further develop the public's understanding of the USACE process.

7.7.6 Outreach

The outreach activity will target specific groups of the public to promote long-term relationships and understanding of the results of the PIR. This activity involves coordination and preparation of meetings, workshops, and written correspondence with interests outside the USACE and SFWMD.

SFWMD Committee Meetings - Several advisory committees have been established to assist the SFWMD in the preparation of water supply plans and other activities relating to the management of water resources in southwest Florida. These committees, as appropriate, will be asked to review and comment throughout the study to ensure that SFWMD's regional water resources planning efforts and the PIR are consistent and cohesive. This process will provide opportunities for local and regional interests to provide guidance and input into the planning process.

Meetings with Other Groups - Coordination with the above groups and others will occur on an as-needed basis, or when requested to do so by the group, to ensure the plans to be evaluated are consistent with local interests and perspectives with regards to wetlands and wildlife conservation, economic development, comprehensive land planning, maintenance of water supplies, and agriculture.

7.7.7 Partnering

Partnering between the USACE and SFWMD is a process of frank and open discussion on expectations and requirements that will shape the coordination, participation, and decision-making process. Partnering meetings will be arranged as needed.

7.8 Environmental Compliance (NEPA)

The Environmental Compliance studies will include the following:

- Development of a SEISs that will be integrated into the PIRs. The SEISs will supplement the Programmatic Environmental Impact Statement contained in the Restudy, July 31, 2000.

- Development and selection of methods to quantify and evaluate the environmental effects of alternative plans.

- Development of evaluation methodologies and tools for comparing alternative plans in terms of their relative environmental outputs and benefits.

Supplemental Environmental Impact Statement (SEIS) - Development of the SEISs will include environmental data collection and evaluation of the environmental character of the study area and project sites and an analysis of environmental baseline development and impact assessments of project

alternatives. These will consist of several components to be evaluated individually and in combination.

The SEISs will address specific impacts for plan components that are determined to be feasible and cost effective. They will be completed in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (91-190) and the Council on Environmental Quality (CEQ) NEPA regulations (40 CFR Parts 1500 - 1508). The NEPA document will generally follow the format described in ER 200-2-2.

7.8.1 Environmental

Environmental studies will be conducted cooperatively with the U.S. Fish and Wildlife Service (USFWS), the Florida Fish and Wildlife Conservation Commission (FFWCC), the Environmental Protection Agency (EPA), National Marine Fishery Service (NMFS) and the Natural Resources Conservation Service (NRCS). At this time, Water quality certifications will not be obtained or requested from FDEP for the Recommended Plans during the study plan phase. The Governors Clearing House Review, conducted by the Florida Department of Consumer Affairs, will provide a process by which the Recommended Plans can receive preliminary approval from the State of Florida. Close coordination with the state will be required throughout the study process to facilitate this preliminary approval, which is essentially the equivalent of a FDEP conceptual permit, as sufficient detail is not available at the completion of the study phase to obtain final state approval.

Coordination will also be accomplished during the NEPA process through Scoping, with follow-up letters and subsequent meetings to ensure public participation during the study process, plan development, and evaluation. After the PIRs are complete and the Recommended Plan receives approval, coordination with the state under the Clean Water Act (Public Law 92-500, as amended) will be required if material is placed within a wetland or waters of the United States.

Although the SEISs will meet the requirements of *Section 404(r) of the Clean Water Act (Public Law 92-500, as amended)*, as addressed in the Section 404(b)(1) evaluation, a Section 401 State water quality certificate will be requested. The Section 404(b)(1) evaluation of the impacts of a proposed action on water quality will be included as an appendix to the SEIS. The water quality certification will be obtained under current Corps regulations and before the PCA execution.

The following activities are required to conduct an impact assessment as required by NEPA.

Initiate Scoping - The necessary coordination will be initiated with Federal, state, and local agencies, Native American tribes, and the public, including coordination needed for compliance with NEPA.

Biological and Field Investigations - A literature search of environmental resources of the area will be conducted. Field investigations of each project site will include an inventory of habitats and species occurrence to determine existing conditions. All work will be accomplished in cooperation with the USFWS and FFWCC, and will be done in conjunction with fieldwork to be performed by the USFWS for the Fish and Wildlife Coordination Act Report (CAR).

Select Impact Assessment Method – Members of the PDT will meet to determine the impact assessment method to be used to evaluate specific environmental responses to project alternatives in the Fish and Wildlife CAR. See "Environmental Evaluation Methodology" (Below) for additional information.

Initial Assessment - Project sites and impacts will be evaluated according to the impact assessment method. All work will be done cooperatively with the USFWS and FFWCC.

Input for Screening Alternatives - An analysis will be conducted to mitigate project impacts with USFWS and FFWCC and feed back into project design.

Water Quality Certification Pre-Application Coordination - Following the approval by Congress of the Recommended Plan, the water quality certification request for each project feature will be completed and submitted to the FDEP when sufficient engineering detail is available (Corps of Engineers Plans and Specs phase).

404(b)(1) Evaluation - Excavation and fill volumes and acreage in wetlands from engineering designs will be obtained, and a 404(b)(1) Evaluation will be prepared for inclusion in the SEIS.

Aesthetic and Recreation Resource Analysis - An aesthetic and recreational resource analysis will be completed and will include a discussion of existing conditions, a comparative resources analysis of impacts of study alternatives and the selected plan, and a delineation of any mitigative design measures if needed.

Input for Final Alternatives - Additional beneficial environmental features will be identified and included in the final project design.

7.8.1.1 Environmental Evaluation Methodology

An evaluation methodology to be used to measure environmental outputs relative to changes in habitat quality of various alternative plans will be developed. An evaluation methodology is needed to predict and compare the environmental outputs of alternative plans and conditions. An environmental impact assessment will be conducted in consultation with the USFWS as a part of the Fish and Wildlife Coordination Act, and specifically for threatened and endangered species under the ESA consultation process. Other agencies in the PDT, particularly the FFWCC, will have active roles in this process. Environmental impact assessment models, including Habitat Evaluation Procedures, may also be used. Models developed will be used to numerically describe optimum habitat quality and provide a basis to predicted changes in comparison to that optimum habitat quality.

The process of identifying "measurements of success" was initiated in the reconnaissance phase of the Restudy. A conceptual definition of what "success" would be in the South Florida ecosystem was developed by the Restudy team through intense public involvement, interagency/multi-disciplinary coordination, and input from the Science Sub-Group. The Restudy also documented techniques by which restoration alternatives could be measured and compared to each other. Hydrologic computer models were used to provide input into habitat models. Numeric output from these models indicated the degree of restoration achieved by each plan. This process and methodology will continue during the advance plan formulation. This effort will include identification of detailed goals, anticipated ecological and hydrologic responses to plan components determined feasible and cost effective, and will establish criteria to evaluate the success of various plans.

7.8.1.2 Fish and Wildlife Service Coordination and the CERP Process

The U.S. Fish and Wildlife Service (USFWS) is the principal Federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants and their habitats for the continuing benefit of the American people. The agency enforces Federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, and conserves and restores wildlife habitat such as wetlands. Natural resource protection legislation relevant to the projects authorized under the CERP that affect the agency's trust resource responsibilities include the Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. 1531 *et seq*.), the Fish and Wildlife Coordination Act, as amended (FWCA) (16 U.S.C. 661 *et seq*.), National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. 4321 *et seq*.), the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Estuary Protection Act (16 U.S.C.

1221-1226), and the Coastal Zone Management Act of 1972 (16 U.S.C. 1451-1464). In addition, several Executive Orders have also established guidance to Federal agencies, including the Service, relative to fish and wildlife protection and conservation.

For CERP projects authorized under the Water Resources Development Act, the Endangered Species Act and the Fish and Wildlife Coordination Act represent the primary authorities under which the Service cooperates and coordinates with project sponsors. These are discussed in greater detail below.

7.8.1.2.1 Federal Activities and Responsibilities under the Endangered Species Act

Section 7(a) of the ESA grants authority and imposes requirements upon Federal agencies regarding endangered and threatened species and designated critical habitat. Section 7(a)(1) directs Federal agencies, in consultation with and with the assistance of the Secretary (Secretary of the Interior/Secretary of Commerce) to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for listed species. This section of the ESA makes it clear that all Federal agencies should participate in the conservation and recovery of listed threatened and endangered species.

Section 7(a)(2) requires every Federal agency, in consultation with the Secretary, to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. This section of the ESA sets out the consultation process, which is further implemented by regulation (50 CFR § 402). For more detailed information on the consultation process required by the ESA, see the Endangered Species Consultation Handbook (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998), which is posted on the World Wide Web at http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm.

Coordination, conference, and biological assessment procedures under section 7 may be consolidated with interagency cooperation procedures required by other statutes, such as NEPA or the FWCA. However, satisfying the requirements of these other statutes does not in itself relieve a Federal agency of its obligations to comply with the procedures and substantive requirements of section 7. The Service endeavors to provide a coordinated review and analysis of all environmental requirements.

A. Consultation Process

1. Informal Consultation Process

The ESA requires action agencies (*e.g.,* the Army Corps of Engineers) to consult or confer with the Services (the Fish and Wildlife Service and the National Marine Fisheries Service) when there is discretionary Federal involvement or control over the action, whether apparent (issuance of a new Federal permit), or less direct (State operation of a program that retains Federal oversight, such as the National Pollution Discharge Elimination System Program). If there is an applicant (*e.g.*, South Florida Water

Management District) for a permit or license related to the Federal action, the applicant may be involved in the consultation process.

Most consultations are conducted informally with the Federal agency or a designated non-Federal representative. Informal consultation determines the likelihood of adverse effects on a listed species or critical habitat. Informal consultations: (1) clarify whether and what listed, proposed, and candidate species or designated or proposed critical habitats may be in the action area; (2) determine what effect the action may have on these species or critical habitats; (3) explore ways to modify the action to reduce or remove adverse effects to the species or critical habitats; (4) determine the need to enter into formal consultation for listed species or designated critical habitats, or conference for proposed species or proposed critical habitats; and (5) explore the design or modification of an action to benefit the species. Figure 1 provides a summary of the informal consultation process.

Informal consultation occurs prior to (1) initiation of formal consultation or (2) the Services' concurrence that formal consultation is not necessary. The informal consultation process may uncover data gaps. In such situations, additional studies may be necessary to document the species' status in the action area to improve the database upon which a biological assessment or, if formal consultation is warranted, a biological opinion is developed.

Candidate species may be proposed for listing in the future, making conference necessary in the future if proposed actions are likely to jeopardize the continued existence of such species. Addressing candidate species at this stage of consultation provides a focus on the overall health of the local ecosystem and may avert potential future conflicts.

2. Biological Assessments and Biological Evaluations

By regulation, a Biological Assessment (BA) is prepared by the action agency. These are required for "major construction activities" considered to be Federal actions significantly affecting the quality of the human environment as referred to in NEPA. Major construction activities include dams, buildings, pipelines, roads, water resource developments, channel improvements, and other such projects that modify the physical environment and that constitute major Federal actions. The biological assessment, including the effects of the action, must be submitted within 180 calendar days of receipt of a species list from the Services.

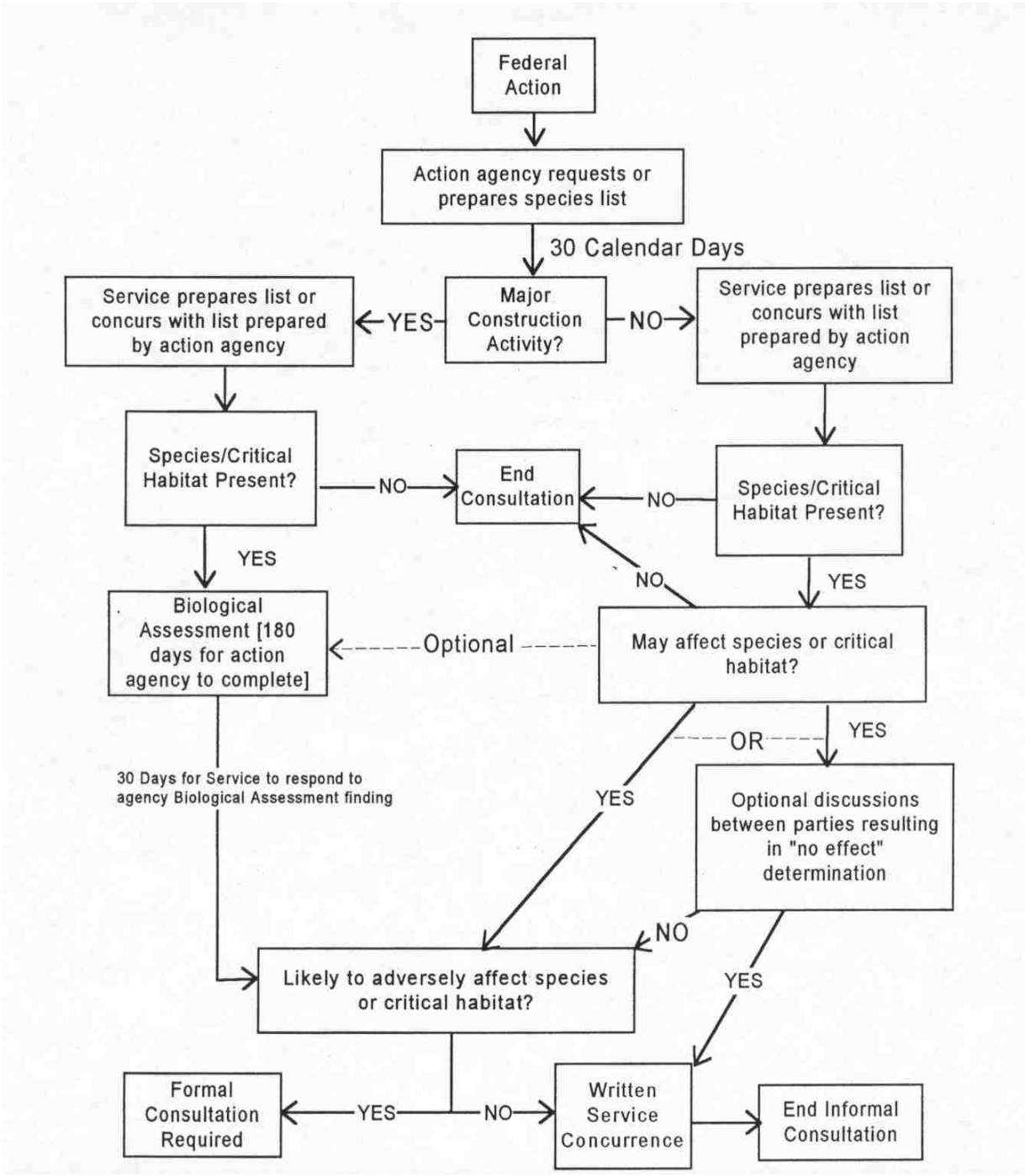

Figure 1. Informal Consultation Process under the Endangered Species Act.

A BA is required if listed species or critical habitat may be present in the project's defined action area. A BA also may be recommended for other activities to ensure the agency's early involvement and increase the chances for resolution during informal consultation. Recommended contents for a BA are described in 50 CFR § 402.12(f). Biological Evaluation is a generic term for all other types of analyses. Although agencies are not required to prepare a BA for non-construction activities, if a listed species or critical habitat is likely to be affected, the agency must provide the Service with an evaluation on the likely effects of the action. Often this information is referred to as a Biological Evaluation (BE). The Service uses this documentation along with any other available information to decide if concurrence with the action agency's determination is warranted.

The BA and BE should not be confused with Environmental Assessments (EA) or Environmental Impact Statements (EIS), which may be required for NEPA projects. The EA and EIS documents are designed to provide an analysis of multiple possible alternative actions on a variety of environmental, cultural, and social resources, with different definitions and standards.

Important questions to address when preparing a BA or BE include: (1) What is being proposed? Describe the project, project area (with relevant maps), proposed management activities, and include supporting documents, particularly those that provide assessment of the proposed site; (2) What listed species my occur in the project area? Use local experts with familiarity with the area to document the reasoning for determination of species absence/presence; (3) Has the proposed project area been surveyed for species that are known to occur or have suitable habitat? Include a clear, detailed description of survey methods; (4) How will the project effect listed species or critical habitat that occurs in the project area? Direct, indirect, and cumulative effects must be considered for this evaluation. Describe measures to avoid, reduce, or eliminate adverse effects or enhance beneficial effects to the species; and (5) What is the action agency's decision?

The ESA requires the action agency to provide the best scientific and commercial data available concerning the impact of the proposed project on listed species or designated critical habitat. The action agency provides to the Service its findings as to the effects to listed species as follows: "No Effect" means that there are absolutely no effects of the project, positive or negative. If effects are insignificant (in size) or discountable (extremely unlikely), a "May affect, but not likely to adversely affect" determination is appropriate. These determinations require written concurrence from the Service. "May affect, likely to adversely affect" means that all adverse effects cannot be avoided. This requires formal consultation with the Service. A fourth finding is possible for proposed species or proposed critical habitat - "Is likely to jeopardize/adversely modify proposed species/critical habitat," which is the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize the proposed species, or destroy or adversely modify the proposed critical habitat. If this conclusion is reached, conference is required.

Following review of the biological assessment or other pertinent information, another informal effort may be appropriate to try to eliminate adverse effects. If that effort results in elimination of potential impacts, the Services will concur in writing that the action, as revised and newly described, is not likely to adversely affect listed species or designated critical habitat. Since concurrence may depend upon implementation of modifications provided by the Service, a concurrence letter provides a statement of modifications agreed to during informal consultation. If agreement cannot be reached, the agency will be advised to initiate formal consultation.

1. Formal Consultation Process

Formal consultation becomes necessary when: (1) the action agency requests consultation after determining the proposed action may affect listed species or critical habitat or (2) the Services, through informal consultation, do not concur with the action agency's finding that the proposed action is not likely to adversely affect the listed species or critical habitat.

Through the formal consultation process, the Service(s) responsibilities include: (1) review of all relevant information provided by the Federal agency or otherwise available, (2) evaluation of the current status of the listed species or critical habitat, and (3) evaluation of the effects of the action and cumulative effects on the listed species or critical habitat. The Service(s) formulates its biological opinion as to whether the action, taken together with cumulative effects is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The Service(s) is required to discuss with the Federal agency and any applicant the Service's review and evaluation, the basis for any finding in the biological opinion, and the availability of reasonable and prudent alternatives (if a jeopardy opinion is to be issued) that the agency and the applicant can take to avoid violation of section 7(a)(2). The Service(s) may also formulate discretionary conservation recommendations to assist the Federal agency in reducing or eliminating the impacts that the proposed action may have on listed species or critical habitat. The Service(s) determines the amount or extent of anticipated incidental take in an incidental take statement included in the biological opinion. Formal consultation is concluded within 90 days after its initiation unless extended in accordance with the provisions of 50 CFR § 402.14. Within 45 days after concluding formal consultation, the Service delivers its biological opinion. This process is summarized in Figure 2.

7.8.1.2.2 Federal Activities and Responsibilities under the Fish and Wildlife Coordination Act (FWCA)

A. Purpose of the FWCA

The central objective of the FWCA is to allow for equal consideration of wildlife conservation with other features of water resource development programs. Congress intended that the FWCA require more than a perfunctory compliance and mandated that project plans developed for water resource programs include justifiable means and

measures for wildlife purposes as the Service finds (in cooperation with the State) and should be adopted in order to obtain the maximum overall project benefits. The FWCA does not apply exclusively to wetland habitats or primarily wetland-dependent wildlife. Important upland habitats affected by projects are also evaluated by the Service.

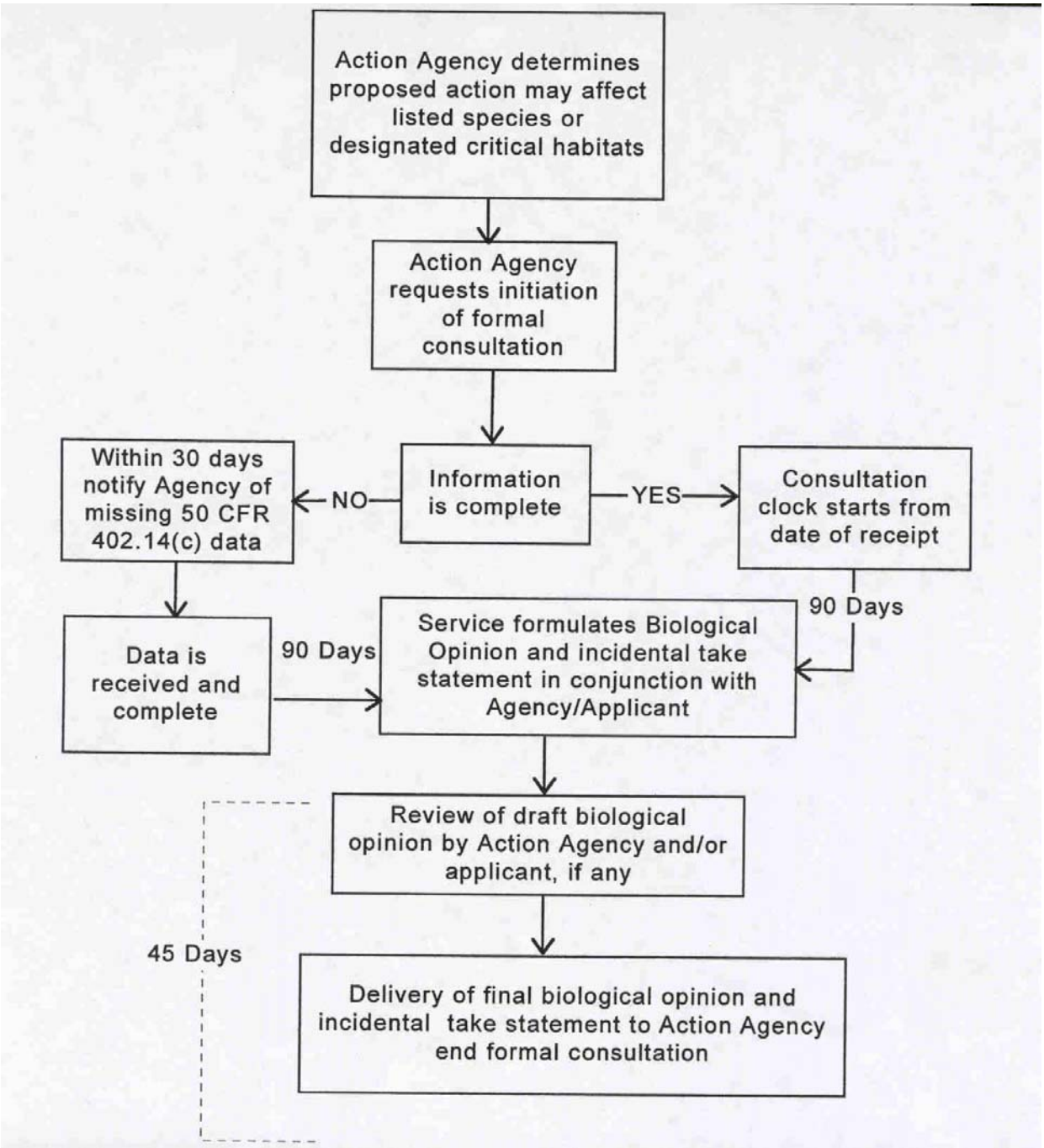

Figure 2. Formal consultation process under the Endangered Species Act.

To accomplish the primary objective of the FWCA, Section 2(a) of the FWCA establishes that pre-construction planning on project development shall be coordinated with the Service. Section 2(b) of the FWCA allows the Service to conduct surveys and investigations to determine impacts of proposed water development projects on wildlife resources and make recommendations to the construction agency that establish measures to prevent loss of or damage to wildlife resources, as well as to provide concurrently for the development and improvement of such resources. Section 2(e) of the FWCA authorizes construction agencies to transfer funds to the Service to conduct such investigations and to prepare reports necessary to carry out the purposes of the FWCA where construction of a project by a Federal agency is involved. In compliance with Sections 2(a), (b), and (e) of the FWCA, the Corps and the Service have established coordination procedures and policy for funding of Service input concerning fish and wildlife resources associated with proposed water and related land resources development activities. The Corps provides transfer funds to support the activities of the Service as set forth in a Scope of Work (SOW) that are determined to be necessary to satisfy study and reporting provisions of Section 2(b) of the FWCA and to provide the Corps with fish and wildlife resources data, information, and analyses. The SOW includes provisions for the Service's attendance at meetings and workshops scheduled in conjunction with the Corps' planning, implementation, and evaluation process.

B. Reporting Requirements

1. Planning Aid Letters (PALs) and Planning Aid Reports (PARs)

The purpose of PALs and PARs is to identify problems and opportunities related to the conservation and enhancement of fish and wildlife resources. In PALs/PARs, the Service reviews conceptual alternatives, provides recommendations for development of new conceptual alternatives, and prescribes the course for future coordination. Key objectives for these reporting documents are to identify opportunities for recovery of listed species and to ensure that a process for promoting conservation and restoration of "unique or scarce" habitats is introduced early in the planning process and carried through detailed design, construction, and post-construction monitoring.

2. The 2(b) Report

Formal reporting requirements are authorized in Section 2(b) of the FWCA. Presented in both a draft and final format, the 2(b) Report is that report prepared in specific response to the Congressional directive of Section 2(b) of the FWCA. The purpose of the 2(b) Report is to provide the views and recommendations of the Secretary of the Interior in his report to Congress prior to Congressional authorization and funding. The report should document the results and findings of the Service's studies, planning, and coordination. It should recommend those actions considered necessary by the Service to accomplish the fish and wildlife conservation goal of the FWCA. The 2(b) Report addresses those alternatives evaluated in the Project Implementation Report (PIR), but focuses on the selected plan (see Appendix Z for the outline of a FWCA report). A draft 2(b) Report is

generally provided to the Corps early enough such as to influence and be attached to the PIR submitted to Division. The draft 2(b) Report and its findings and recommendations are then available for public release during the public comment period. To the extent that the selected plan is modified as a result of the public review process, the draft 2(b) Report is revised and finalized early enough to be made an integral part of the final EIS and PIR.

C. Coordination Responsibilities and Requirements

Coordination with other Federal and State agencies is an important responsibility of the Service under the FWCA. For those projects affecting marine or estuarine resources, the Service coordinates with the National Marine Fisheries Service (NMFS). The Service also coordinates the development of the 2(b) Report directly with the Florida Fish and Wildlife Conservation Commission (FWC) and other State agencies as required. Copies of concurrence letters, either from the FWC or the NMFS, are generally appended to the FWCA report. Coordination with local sponsors is also important, particularly in light of the Corps/SFWMD planning partnership established by cost-sharing agreements.

D. FWCA and Avoidance, Minimization, and Enhancement Related to Fish and Wildlife Habitats

Two documents form the foundation for the Service's FWCA recommendations regarding mitigation: (1) the definition of mitigation in the NEPA regulations (40 CFR Parts 1500-1508), and (2) the Service's Mitigation Policy (Federal Register; Vol. 46, No. 15; January 23, 1981; pp. 7656-7663). The Service may also cite policy that prohibits compensatory mitigation on National Wildlife Refuges (Federal Register; Vol. 64, No. 175; September 10, 1999; pp. 49229-49234).

Mitigation requires the following sequence of steps:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments (often called "compensatory mitigation").

The Programmatic EIS for the Comprehensive Plan (Corps 1999) states that the construction features will be designed to first avoid and then minimize impacts to wetlands or other aquatic sites and natural upland habitats. Avoidance and minimization is the emphasis of the Service's early planning assistance. The PEIS states that unavoidable impacts to these habitats are expected to be offset by the ecological restoration achieved by the Comprehensive Plan. The Corps concluded that separable

mitigation features were not included in the Comprehensive Plan, but a commitment was made to provide separable compensatory mitigation under two conditions: (1) unavoidable impacts on "unique or scarce" habitats, or (2) impacts on existing wetland compensatory mitigation sites that were established by authorized regulatory permits.

7.8.1.2.3 Field Studies

Cooperatively assist in field studies to establish habitat conditions. Site visits will be conducted for the purpose of obtaining field information and data on specific attributes for study areas. Field studies will be accomplished cooperatively with the FFWCC, the USACE, SFWMD, and other appropriate resource agencies or groups to insure consistency and effective interagency communication.

7.8.1.2.4 Selection of Environmental Models

Cooperate with the USACE and SFWMD in the selection of models and/or an array of tools to conduct an assessment of environmental effects. Models (such as Habitat Evaluation Procedures, Across-Trophic-Levels System Simulation, and others) will be reviewed to determine their capacity and compatibility to make the required evaluations.

7.8.1.2.5 Evaluation of Alternative Plans

Assist in the analysis and evaluation of projected environmental responses to alternative project plans based on model outputs, results of various assessment tools, and other methods. Recommendations on improvements to project alternative features will be made based on these evaluations. Project alternatives will be ranked according to their benefits to fish and wildlife resources. Recommendations on how to minimize or eliminate any detrimental impacts will also be made.

7.8.1.3 Cultural Resources Studies

Cultural resources studies will include an evaluation of the impacts of the alternative plans upon historical, architectural, and archeological resources. It is anticipated that cultural resources are present within the large study area, including properties listed on or eligible for listing on the National Register of Historic Places.

Appropriate cultural resources investigations will be conducted to locate and identify potentially significant historic properties that will be affected by alternatives. Initially, a comprehensive archival and background review will be completed, and an historical overview will be compiled. An assessment will be

made of architectural and engineering features, which may be affected, and an archeological sample survey will be undertaken.

All studies will be coordinated with the Florida State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP) in accordance with the *National Historic Preservation Act, as amended (PL 89-665)*, and the *Archeological and Historic Preservation Act, as amended (PL93-291)*. The National Register eligibility of all historic properties that may be affected will be established and efforts will be made to avoid or reduce effects to National Register eligible properties. For those National Register historic properties that will be adversely affected, mitigation plans will be developed in consultation with the SHPO. Documentation will be submitted for review to the SHPO and ACHP, as appropriate.

An assessment of the impacts of the proposed project upon cultural resources will be prepared as part of the *National Environmental Policy Act (NEPA)* analysis. Costs attributable to work under this account include the effort required to prepare input for the draft, and final *PIR*, as well as participation in each of the required review conferences and resolution of comments as a result of the conferences.

Initial archeological assessment, including cultural resources archival and background review and historical overview. During this activity a records check will be conducted to determine the extent of present knowledge of cultural resources in the project areas. Project areas will be visited to determine field conditions. The initial assessment will be completed prior to the Alternative Formulation Briefing.

Scopes of Work will be prepared for Phase I archeological reconnaissance. It is assumed for purposes of preparing this cost estimate that the Phase I report will be done by a separate contract.

A Phase I Investigation will be conducted of those areas that the assessment identifies as requiring this level of investigation. This effort will be performed by contract.

7.9 Value Engineering

Engineer Regulation 1110-2-1150 requires a value engineering study for all projects with an estimated construction cost of $2.0 million or more. A value engineering team study shall be performed on the earliest document available that establishes the functional requirements of the project and includes a Microcomputer Aided Cost Engineering System (MCACES) cost estimate. The Project Delivery Team (PDT) shall determine whether the

initial value engineering study shall occur during feasibility phase or be delayed until the Pre-construction, Engineering, and Design (PED) phase. After the initial VE study is completed, and based on the recommendation of the PDT, the Commander will certify that the design achieved in the PED effort is the most cost effective for this design phase. Also, during the preparation of each design document, additional value engineering team studies will be conducted if the PDT identifies areas for potential cost savings and/or design improvements. The PDT will include a value-engineering representative from SFWMD and the value-engineering officer from USACE.

The Value Engineering Plan, Appendix L, assumes that the VE study will be performed after final approval of the PIR as the first step in the DDR/PED phase. Assuming the WCE exceeds $2,000,000, the following is used:

> A Value Engineering (VE) Study, with a duration not to exceed two months, will be performed after approval of the (PIR or Feasibility Study). The study will be conducted in accordance with the provisions of ER 1110-2-1150, *Engineering and Design for Civil Works Projects*, 31 Aug 1999, and the most recent VE policy guidance. The study will identify potential project cost reduction measures to be implemented in the Pre-construction Engineering and Design (PED) phase. The study team will include five to ten members with professional experience consistent with project goals.

To capture the benefits of potential cost reducing construction methods and technologies employed by a contractor, Value Engineering Change Proposal clauses, in accordance with FAR 52.248-3, will be included in all project construction specifications.

7.10 Water Control

The water control plan includes regulation schedules and operating criteria for the project and additional provisions as may be required to collect, analyze, and disseminate basic data; prepare detailed operating instructions; ensure project safety; and carry out the operation of the project in an appropriate manner. Historical data will be collected and analyzed. Operational rules and criteria will be developed for all water control structures, including pump stations, culverts, and spillways. The water control plan should ensure that the objectives of CERP, as well as other authorized project purposes, could be met. This will require transforming the necessary hydrologic modeling into practical, real-time operational criteria and rules.

The development of water control plans will evolve as a project evolves, as new, more detailed information becomes available. Draft water control plans will be completed during the PIR phase. Interim water control plans will be completed during the detailed design and plans and specifications phases. Preliminary water control plans will be completed prior to the completion of construction, and final water control plans will be completed during the post-construction operational testing and monitoring phase. At any point during this process, it may be appropriate to revise the water control plan that is operable at the time. While flexibility will be designed into the water control plans to accommodate the adaptive assessment approach to project implementation, revisions to water control plans may be necessary to account for changing conditions, assessments from the RECOVER teams, or new projects coming on line. Development of the water control plans will be carried out in a public process and within the framework of appropriate laws and regulations.

USACE and SFWMD will jointly develop the water control plans. The development of the water control plans should be coordinated with the South Atlantic Division (SAD) consistent with applicable regulations.

7.11 Operations and Maintenance

A complete Operations and Maintenance Plan (Appendix O) will be developed following the construction of the LOWP. Once the design and permitting issues have been addressed, a draft of the Operations and Maintenance Plan will be developed. Immediately upon acceptance of each project feature, it will be turned over to SFWMD for operation and maintenance. As the project is constructed, interim operations and maintenance manuals and interim water control manuals will be prepared by the contractor and provided to SFWMD for each completed project feature. Upon completion of project construction, final operation and maintenance, and water control manuals will be provided to the SFWMD.

7.12 Socioeconomics

7.12.1 Support for plan formulation

Support for plan formulation will include assistance in the development of performance measures, development of criteria for measurement, evaluation, and construction of decision matrices.

7.12.2 Preliminary Economic Survey

After the preliminary development of plans and preliminary hydrologic evaluation has been developed, a preliminary survey will be undertaken to

determine if flood control impacts, water supply impacts, or recreational impact opportunities are available with any of the evaluated alternative plans. Impacts will be identified but not quantified during this survey. The following items will be answered during the survey.

a. Flood Control Impacts

1. There may be possible reservoir retention during flood events. This may prevent localized flooding. However, the management of the reservoir during flood events for flood control may not be compatible with water quality objectives.

2. It is possible that reservoir retention may reduce stages in the lake to provide some protection for levee breaching. This seems unlikely since the size of reservoir would not be sufficient to reduce or maintain lake stages during a large event.

3. If reservoirs externalize flooding to adjacent areas, the contractor will be required to compare the cost of flood damage mitigation to buyout and propose a solution. If urban areas are impacted, buyout and relocation costs must be considered.

4. Contractor will closely co-ordinate hydrologic and hydraulic design with plan formulation team members to identify any other opportunities to enhance flood protection.

5. As with other impacts, results of this investigation should be reviewed with the conclusions of the Restudy to determine if both are in agreement or if RECOVER issues are present.

b. Recreation Impacts

1. Are any positive recreation opportunities created here, especially with one large reservoir? If any are created they must be consistent with the reservoirs primary purpose of improving or maintaining water quality.

2. Recreation opportunities need to be consistent with CERP program guidelines. These guidelines are still to be defined by policy decision makers in the CERP framework. For example:

a. Does every element have to have recreation?
b. Do we need an overall recreation master plan?
c. Where do we want to encourage or discourage recreation?

d. What types of active or passive recreation are to be encouraged or discouraged?

3. Contractor will closely co-ordinate hydrologic and hydraulic design with recreation team members to identify any other opportunities to create or enhance recreation consistent with CERP guidelines.

c. Agricultural Water Supply Impacts

1. Are there any opportunities to provide additional nutrient rich water for irrigated pasture or cropland during the dry season and periods of low flow?

2. Can the nutrient uptake of the reservoir be harvested and used on croplands?

3. Any positive impacts must be consistent with the reservoirs primary purpose of improving or maintaining water quality.

4. As with other impacts, results of this investigation should be reviewed with the conclusions of the Restudy to determine if both are in agreement or if RECOVER issues are present. Will the project actually contribute to the extent mentioned in the Restudy? Does the hydrologic functioning correspond with the modeling in the Restudy? Are there any additional opportunities to create additional beneficial water supply impacts to the regional system not discussed in the Restudy? These are RECOVER issues.

7.12.3 Urban Flood Control Impacts

Urban flood control impacts will be evaluated in the study area. Tasks will include the preparation of an existing land use for the study area, future land use for the study area without the project and the development of expected alternative land use changes in the study area with each alternative. Also included will be real estate evaluations for structure and content damage and the evaluation of impacts.

a. Existing Land Use

The economic study area should include at a minimum the maximum flood prone area and any additional area agricultural area that could receive an agricultural water supply benefit. Existing land use should be projected to base year of project life. Preparation of the existing land use classifications and map will depend upon existing planning reports, field surveys, aerial photographs, tax assessor maps, USGS quadrangle sheets, and other GIS based information.

b. Future Land Use Without Project

Development of a future land use pattern requires existing and future population, employment, housing, and income projections. Future quantities of land use development will then be projected using expected density equivalents. Economic variables will be projected in 10-year increments for a 50-year project horizon. Quantities of land use will be allocated spatially using land capability criteria, gravity models and area zoning requirements. Compute by smallest available unit, e.g. traffic zones. A base map will be prepared with this information.

c. Real Estate Evaluations for Flood Control

Studies will determine structure and personal property contents values for residential structures in the basin. Tasks will include identifying residential structures, determining appropriate groupings for commercial and industrial structures, the delineation of subject areas on a base map and determining structure value using the replacement less depreciation method and content values as a percentage of structure value.

d. Determining Flood Damage without the Project and for Alternative Plans.

This task will include integrating damage related information about affected structures under several flood probabilities and computing damage potential on an average annual basis (or expected value basis). Tasks to assess damage potential will include comparing the elevation of flood-prone structures to flood stage information and determining depths in structures. Damage relationships will be constructed to assess damage potential in each of the structures.

7.12.4 Agricultural Flood Control Impacts

Information will be collected pertaining to existing and future agricultural land use and impacts will be computed as discussed below:

a. Data Accumulation for Existing Land Use

For truck crops, tasks will include the development of topographic information for agricultural types of land use, determine root zone depths and bedding heights, determine cropping patterns to include the number of crops per year and rotational patterns. For pasture, management measures

and carrying capacities will be developed. Damage relationships will be developed for each category to include citrus and horticulture.

b. Data Accumulation for Future Land Use

Tasks will include preparing a future agricultural pattern. If truck crops are involved in the evaluation, tasks should include preparing a locally preferred farmer's plan and a SFWMD plan. The locally preferred farmer's plan would include input totally from the farmers and agricultural agents. An SFWMD plan would provide a compromise between environmental and farming concerns with input from farmers. Tasks would include the computation of quantities of future agricultural acreage expected in the basin by land use, type using projections by relevant sub-area in 10-year increments and the location of future land use quantities on maps based upon a rational growth concept. Locate on base maps.

c. Future land use changes with project alternatives

Agricultural businesses may experience increased chance of flooding or loss of economies of scale due to land purchases. Some agribusiness may or may not be able to continue to operate under these conditions. Tasks will require determining where real estate easements or land purchases will be required to compensate for either increases in flooding potential or business losses. The quantities of existing and future agricultural usage that will be affected by project related efficiencies would be determined. Finally, the location of these properties will be determined and negative or positive regional effects upon agriculture will be computed.

d. Determine Flood Damage without the Project and for Alternative Plans

This task will include integrating damage related information about affected agricultural uses under several flood conditional probabilities and computing damage potential on an average annual basis (or expected value basis). Tasks include determining water level in root zones and damage potential for truck crops and fruit crops, determining the affects of interrupting cow-calf operations and losses incurred due to the duration of flooding to improved and unimproved pasture uses and losses of business to dairy operations.

7.12.5 Agricultural Water Supply Impacts

The objective of this section is to identify any benefits that would accrue to agriculture due to the availability of increased irrigation water. The evaluation will take into account the additional quantities over and beyond rainfall available and the seasonal availability of such deliveries. These quantities are contingent upon environmental needs being met first. Tasks would include an existing literature search, determine affected acreage, classifications of existing crop land in study area, and determining appropriate crop budgets inside and outside the project area with and without supplemental water. Evaluation for agricultural uses other than cropland would be similar.

7.12.6 Recreation Studies

This includes the investigation of all general recreational opportunities. Co-ordination with local planning department is necessary to determine if any interest in cost sharing general recreational opportunities. Investigate if additional fishing and hunting opportunities would be feasible. Investigate the possibility of eco-tourism or other environmental passive forms of recreation with the proposed plans. Recreational studies tasks for benefit evaluation would include, the description of project area and existing recreation facilities, the determination of existing supplies, determination of use standards, computation of peak day and expected annual demand, distribution of annual demand, evaluation of base condition, evaluation of the modified conditions, determine the differences in annual participation and determine willingness to pay per visit.

7.12.7 Other NED Impacts

It is not anticipated that deep draft navigation, urban water supply, or commercial fishing will be impacted with the proposed alternatives. However, the contractor must do enough work to document this conclusion. As with other impacts, results of this investigation should be reviewed with the conclusions of the Restudy to determine if both are in agreement or if RECOVER issues are present.

7.12.8 Cost Efficiency Tradeoffs for different alternatives to achieve Selected Environmental Targets

Each alternative analyzed should be cost effective. Different alternatives may include reservoirs, chemical treatment or some combination of both. Design decisions in a reservoir retention alternative would include size, and the location and number of reservoirs. These decisions will affect real estate costs, pumping costs, and distribution network costs. A life cycle cost

evaluation includes time value calculations, comparability, price levels, and interest rate calculations for the following items:

1. Real Estate costs
2. Plant and equipment costs
3. Other construction costs
4. Operation and Maintenance costs
5. Replacement costs
6. Monitoring costs

A life cycle cost evaluation for each alternative will be provided.

7.12.9 Incremental Analysis and Cost Effectiveness for Environmental Evaluation

It is expected that there will be a biological evaluation completed to quantify the existing problems in the study area and to what degree the alternatives alleviate these problems. Quantifiable output may be habitat units or some other form of measure. The evaluation set up here is not designed to maximize net water quality benefits or provide a selected design for the alternatives. The analysis uses environmental outputs from the study and only provides a measure of cost effectiveness assuming that certain targets are necessary for acceptability of the design.

Tasks involved in this section include reviewing provided outputs and cost estimates for multiple plans, categorizing plans and outputs in a consistent way to utilize computer evaluation software such as CEA or IWR Plan, conduct incremental evaluation on most cost effective plans and incorporate risk decisions into the evaluation for selected plans. In addition it will be required to compute incidental benefits if applicable or compute any incidental benefits forgone if applicable.

7.12.10 Regional Economic Impacts

a. Direct Impacts

1. The evaluation of direct impacts with the restoration plans on agricultural operations in the Okeechobee Watershed and Taylor Creek – Nubbin Slough.

This item will assess the direct impacts upon agricultural activities by land use type with emphasis upon cattle ranching and dairy operations due primarily to land acquisition for the reservoirs. Existing and future land use patterns will have effects upon the evaluation. Measures might include:

a. Evaluation of the loss of net returns to agricultural activities.

b. Additional losses due to losses of economies of scale to rangeland operation and dairy management practices.

1. Actual losses with existing technology
2. Losses with improved proposed technology (IFAS).

2. The evaluation of direct fiscal impacts on Okeechobee County with the restoration plans.

a. Direct impacts upon the county's municipal tax base with the removal of project lands from the tax rolls.

A crude measurement of direct impact might be to use the ad-valorem assessment rate multiplied by the average value of each land use parcel removed.

b. Losses from discontinued uses of county infra-structural services associated with impacted lands.

Services such as waste disposal and permitting operations may produce revenue for the county that are not included in ad valorem millage rates. Direct determination of these losses could be investigated with discussions with County managers. A percentage might be developed using best professional judgment.

c. Changes in sales tax revenue returned to the County via revenue sharing, given the losses of taxable wholesale products with the removal of productive land from service.

Discussions with County managers may determine the significance of the impact.

3. The evaluation of direct impacts with the restoration plans on local income and employment for Okeechobee County.

This evaluation would be limited to basic direct impacts. Efforts would involve determination of full time equivalent (FTE) man-years of employment and corresponding income either lost or displaced with the restoration Plans. Assessment of direct employment and income impacts should focus primarily on cattle ranching, dairy farms and other agricultural activities in the area.

b. Indirect Impacts

1. The evaluation of immediate indirect and induced impacts with the restoration plans on the Okeechobee Watershed and Taylor Creek – Nubbin Slough.

All of the direct impacts listed in categories above will have additional immediate indirect impacts to the local economy. Indirect or secondary impacts can be measured in terms of the loss of full time equivalent employment units and income. Impact categories listed in the Central and Southern Florida Project Comprehensive Review Study (Restudy) should be used as a minimum. They include:

a. Impacts due to construction activities.
b. Impacts due to real estate purchases.
c. Impacts due to changing land use.
d. Impacts due to altered water deliveries.
e. Impacts due to monitoring costs.

To adequately evaluate these issues it is suggested an appropriate input-output model (I/O) be used. IMPLAN (Impact Analysis for Planning) is a static input-output regional economic model originally developed by the U.S. Forest Service, was used in Restudy. As originally conceived, IMPLAN was developed for this type of evaluation and is an excellent choice for determining economic interrelationships between agriculture and other sectors of the economy. Suggest Department of Commerce I/O Model (RIMS II) be used also to verify that the results from IMPLAN are reasonable if sufficient time and funding are available to do both.

2. The evaluation of subsequent indirect and induced impacts with the restoration plans on the Okeechobee Watershed and Taylor Creek – Nubbin Slough.

Results for I/O models are only good at a specific point in time. Therefore, the I/O model alone does not answer whether or not losses of employment and income will continue into the future or whether these effects will diminish over time as the unemployed are re-employed into other sectors of the local economy, or elsewhere. An advantage of having a demand-driven (econometric) model in addition to an I/O model is that residual effects from an impact occurring at the beginning of a period can be estimated in successive time periods. A large adverse initial impact in employment, income, etc., may become less over time given advances in technology and substitution effects in the labor force due to educational and training opportunities, etc. Models are available which attempt to explain these changes.

7.12.11 Other Social Effects

1. An existing and future demographic profile of the project area

This section will be written to give the reader a general understanding of the economic and social characteristics of the area. The evaluation should include but not be limited to the following for the existing profile:

a. Social Information
   1. Spatial description.
   2. Population.
   3. Age Distribution.
   4. Sex Distribution.
   5. Ancestry and Ethnic Characteristics.
   6. Education.
   7. Family Size.

b. Economic Information
   1. Total income and per-capita income.
   2. Family income.
   3. Poverty status.
   4. Income and Wages by sector.
   5. Employment by sector.
   6. Land use acreage and spatial distribution.
   7. Public Services provided.
   8. Community Cohesion and existing "well being".

2. The evaluation of immediate and subsequent direct, indirect and induced economic impacts upon Social Groups with the restoration plans on the Okeechobee Watershed and Taylor Creek – Nubbin Slough.

This evaluation is an expansion of the regional evaluation section. This evaluation will clarify not only the total employment and income effects but will stratify these effects by social group. Stratification should be sufficient to comply with some of the economic and social requirements of EO 12898, (Environmental Justice Executive Order). At a minimum group stratification should include the following:

a. By Income Group
b. By Ethnic Group

3. The evaluation of social effects upon Social Groups with the restoration plans on the Okeechobee Watershed and Taylor Creek – Nubbin Slough.

To be determined in field investigations.

7.13 Environmental Justice

7.13.1 Goal

The goal of this plan is to fulfill William J. Clinton's Presidential Executive Order 12898 to achieve environmental justice in Federal projects, as defined in his own words, "by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations ".

This plan will provide the framework for a ground level public outreach process to bring the low income, minority and tribal populations in the project area into a process that will identify environmental justice issues and participate in analysis and mitigation of impacts to those peoples. This plan will follow the evolving body of knowledge recognized in national level documents and adjust as appropriate to implement the accepted practices that ensure environmental justice. People recognized for environmental justice knowledge and expertise may be contracted or consulted to participate and or facilitate review of the practices used in implementing this plan.

The elements described below in this plan were garnered from knowledge within many documents available to the public, including *Executive Order*

12898, *PBS NEPA Desk Guide October 1999*, *Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs*, The National Environmental Justice Advisory Council's *"The Model Plan for Public Participation"*, The Council on Environmental Quality's *Environmental Justice, Guidance Under the National Environmental Policy Act,* and their *Guidance for Considering Environmental Justice under the NEPA*, also multiple Fact Sheets and summaries from NEPA Call-In.

This plan presents six essential elements Initial Screening and Scoping, Public Participation, Environmental Analysis, Community Analysis, Alternatives and Mitigation, and Reporting. These elements follow a logical progression that will often overlap and will be implemented with practices acceptable in the current national body of knowledge and will be modified appropriately to remain current. Many factors will affect the activities within these elements, depending largely on the determination of environmental impacts and to what degree this may affect a minority, low income or tribal population.

This plan will be closely coordinated with the project's public outreach plan and will comply with the NEPA reporting requirements. This project's environmental justice plan will forward reports and findings to the personnel assigned to the Environmental Justice program for the CERP.

7.13.2 Initial Screening and Scoping

Initial Screening and Scoping will seek to identify potential issues and estimate the geographic extents of the environmental areas and the minority, low income and tribal populations that may be affected. Map products may be created as appropriate to display geographic information. Initial Screening and Scoping will overlap and be closely linked to public participation in practice as the identification of residents and people who frequent the Study Area may be accomplished through portions of the public outreach practices. Any number of sources may provide information including grassroots, environmental, labor, religious, and community organizations.

The geographical extent of the potentially affected area will be estimated by those involved in the project and adjustments to the geographic extents can be made as required when knowledge improves. In determining who may be affected, both residents and people who frequent the area are to be considered. It will be determined if the composition of the resident community of the affected area is meaningfully greater than the minority, low income or tribal population percentage in the general population or of appropriate unit of geographic analysis. Impacts to people due to a community's distinct cultural practices or different patterns of living, such as

a principal subsistence on fish, vegetation, or wildlife consumption or the use of well water may be relevant to the analysis.

- Familiarize project team with NEPA and Environmental Justice requirements
- Read the NEPA Desk Guide 9.2, EJ Studies
- Estimate the geographic extent of the possible environmental impact
- Determine the minority community locations within the geographic extent using best available census data
- Document additional efforts to accomplish inclusive outreach
- The project manager will verify that reasonable effort has occurred to encourage meaningful participation in outreach meetings from the minority communities in the potentially environmentally impacted area
- Additional meeting(s) may need to be accomplished to reach minorities and complete screening
- Obtain records of times, places and attendance of minorities to outreach meetings
- Document, yes or no, any potential issues presented by minorities or others, address adverse, high and disproportionate considerations and present to program staff
- With program staff, consider if base health studies may be needed

7.13.3 Public Participation

Public participation is intended to reach low income, minority and tribal populations to identify issues of true concern and allow relevant issues to be in the early analyses portions of the process. This may involve activities beyond the standard advertising and public outreach practices and will seek to overcome linguistic, cultural, institutional, geographic and other barriers to meaningful participation. Meetings will be held in adequate facilities at hours appropriate for those attending.

Public participation will be active throughout the entire project to educate, encourage input, answer questions, listen to concerns, and tell people how we intend to deal with the concern. Furthermore, public participation will cooperate with the project's public outreach program and will occur in the Initial Screening and Scoping. All NEPA documents including Categorical Exclusions, (CATEX), Environmental Assessment, (EA) Finding of No Significant Impact, (FONSI), Record of Decision, (ROD's) and Environmental Impact Statements, (EIS) will be available to the public. If EIS meetings are scheduled they will be noticed to the Federal Register, the public, and communicated to appropriate groups that have become known to project personnel.

Each Project Manager will familiarize themselves with the existing public and minority outreach programs schedules and processes to ensure achievement of public outreach goals. The Project Managers will:

1. Contact Public Outreach and Socioeconomic Environmental Justice staff prior to FAW notice and allow time for minority contacts to be made
2. Provide public comment opportunities at project delivery team meetings

3. Ensure meaningful minority participation, which may include:
    a. Extraordinary advertising efforts and community leader contact
    b. Provision of language translators for verbal and printed media
    c. Meeting places easily accessible to minorities
    d. Presentation materials are easy to read
    e. Presentation materials contain information specific to the communities concerns
    f. If environmental justice issues have been identified continue to educate, build trust and understand the issues

7.13.4 Environmental Analysis

The Environment Analysis element will require the project personnel to monitor the analysis of the environmental impacts throughout the NEPA process. They will ensure that environmental justice issues learned through the Initial Screening and Scoping and Public Participation receive appropriate treatment. This element will be active during any of the NEPA processes including CATEX, EA, FONSI, EIS and ROD's. The extent of or lack of environmental impact findings controls the extent of possible disparate impacts.

- Maintain minority participation during NEPA process
- Educate minorities on analysis process to determine environmental impacts
- Review the estimate for the geographic extent of possible environmental impact
- Review effected minority communities to verify sufficiency of participation

7.13.5 Community Analysis

The Community Analysis element will be triggered, primarily, in the NEPA processes requiring an EA or an EIS. However, if a narrow focused analysis of the project's impacts demonstrate a high and disproportionate effect on minority communities, even when impacts are not significant in the NEPA context, then an expanded Alternative and Mitigation process can be initiated. Through appropriate tools it will be determined if the proposed

projects environmental impacts will have an effect on minority, low income, or tribal communities and if high and disproportionate. Determination will consider the intensity of effects not only for direct impacts on the health and environmental quality but also for indirect, multiple, and cumulative effects. Additionally, it is recognized that the cultural, social, occupational, historical, and economic characteristics of the community may amplify the environmental effects. The Community Analysis element will interact with the Alternatives and Mitigation element, as public input will be considered as changes may be made to the project to mitigate affects.

- Maintain minority participation during process
- Include not only populations that live in the area but those that frequent the area
- Educate minorities on analysis process to determine environmental impacts
- Discuss disparate, adverse, high and disproportionate, impacts analysis
- http://es.epa.gov/oeca/oej/titlevi.html
- Identifying the affected population
- Determining the demographics of the affected population
- Determining the universe of facilities and total affected populations
- Statistical significance of the disparate impact
- Discuss cultural, social, occupational, historical, or economic characteristics that may amplify the environmental effects
- Discuss cumulative analysis

7.13.6 Alternatives and Mitigation

This section is reserved for documents that will be developed and made available at a later date.

7.13.7 Reporting

The Reporting element will comply with all the NEPA requirements to provide environmental justice discussions within each Record of Decision. Reporting will be an iterative process overlapping with the other plan elements. These NEPA reports and a general record of issues and meetings held as part of the environmental justice plan will be given to the personnel responsible for environmental justice at a programmatic level for the Comprehensive Everglades Restoration Plan.

- Sample forms from NEPA call-in web site to be considered along with what CORP has used

- Provide qualitative & quantitative reports to RECOVER, Report Card etc.

7.14 Restoration Coordination and Verification (RECOVER) Integration

RECOVER is organized to examine projects in a systematic manner to ensure the success of the Comprehensive Everglades Restoration Plan. RECOVER ensures that a system-wide perspective is maintained as each project is planned and implemented. As a part of this responsibility, RECOVER will evaluate the LOWP Project Implementation Report for its contribution to the overall system. RECOVER will also provide support to the LOWP PDT for the purpose of maximizing the compatibility and performance of the restoration project within the context of the full plan. The following describes the RECOVER tasks necessary to assist the PDT. In general, it is assumed that SFWMD and USACE will share the workload necessary to assist the PDTs and that no other agency will be requested to support this task.

a) *Initial PDT Contact* -- The RECOVER Team will make initial contact with the LOWP Project team. RECOVER will organize a briefing for the PDT that includes the CERP history and vision as to how the project was formulated and how it fits into the larger picture of the Comprehensive Plan. To insure adequate coordination between RECOVER and the project team, a point of contact from RECOVER will be assigned.

b) *Review PDT Deliverables* -- The RECOVER Team will work with the project team in the development of the project management plan, to insure that a formal review process for the project is in place, and to discern other appropriate points of support by RECOVER. These will be documented in the project management plan. Further, RECOVER will review draft and final report products produced by the LOWP PDT. necessary to optimize the performance the recommended project to provide maximum benefits to the regional system.

c) *Issue Resolution* -- If a PDT selects a plan that does not achieve the performance predicted by CERP, the RECOVER co-chairs will organize an ad hoc team to attempt to resolve the issue, following an agreed-upon issue resolution process. The ad-hoc team may be made up of members of the PDT, RECOVER, and additional expertise as needed.

d) *Document regional benefits of the* LOWP *Project.* RECOVER will review alternative plans for the LOWP. If a hydrologic model is not available or appropriate for the project, the RECOVER analysis will consist of the team's best professional judgment of whether the alternative is consistent with the Comprehensive Plan. The RECOVER will suggest improvements,

if needed, and work with the PDT as necessary to optimize the performance the recommended project to provide maximum benefits to the regional system

e) *RECOVER PIR Reports* -- All RECOVER interactions with a PDT will be documented in written format. A final RECOVER report will document how the PDT's recommended plan is predicted to influence the system-wide performance of CERP. This report will also document any changes that occurred during the project formulation and design as a result of the system-wide evaluations, and any action that may be necessary to amend the Comprehensive Plan.

f) *Continuing PDT Contact* – RECOVER will provide references to information that will help the project team understand the system-wide performance objectives of the Comprehensive Plan. The PDT will develop its own performance measures, which may be based on system-wide targets as well as local targets. The RECOVER Regional Evaluation Team will be available to assist in the development or review of performance measures to insure compatibility among the system-wide and project measures. The RECOVER will assist as necessary in the development of the 'without-project' condition. One goal of each PDT will be to provide system-wide performance that, at a minimum, meets the performance predicted for CERP. The RECOVER will assist the PDT in looking for opportunities to use the project planning process to improve the performance of CERP.

7.15 Project Cooperation Agreement

During the development of a Project Implementation Report, the USACE and the SFWMD will develop a draft Project Cooperation Agreement. Upon finalizing the Project Implementation Report, which will be forwarded as the project decision document for Congressional authorization, a draft Project Cooperation Agreement package will be prepared. In accordance with Engineer Regulation 1105-2-100, this package will consist of a draft Project Cooperation Agreement, a statement of financial capability (an assessment of SFWMD's ability to fund its share of the project costs), and a letter of support from the SFWMD. Project managers assigned to the USACE Jacksonville District's Programs and Project Management Division will compile and coordinate review of the draft Project Cooperation Agreement package. The draft Project Cooperation Agreement package will be submitted to the USACE South Atlantic Division, USACE Headquarters and the Assistant Secretary of the Army for Civil Works. The final Project Cooperation Agreement will then be returned to the Jacksonville District for signing by the SFWMD. The signed Project Cooperation Agreement will be transmitted to the Assistant Secretary of the Army for Civil Works for final signatures. See Appendix R for additional information.

7.16 Monitoring

Monitoring within the project area will be required at three levels: programmatic, basin, and project. This system will measure total phosphorus loads and water inflows to Lake Okeechobee and ecologic changes. This information will be used to evaluate performance of all CERP projects (including C-43 and C-44 reservoirs, EAA storage, ASR wells, etc). The programmatic monitoring will be conducted at the CERP program level and therefore will not be directly funded by the Lake Okeechobee Watershed Project.

The objectives of the basin-scale monitoring are to measure phosphorus loads and flows from individual basins in the watershed. This information will be used to evaluate the performance of individual CERP projects combined with all other interagency and private projects in the basin. Basin scale monitoring will be initiated during the PIR phase and will the responsibility of the USACE. It is anticipated that an agreement will be entered into with the USGS to accomplish this task.

Basin-scale Monitoring Objectives

1. Measure the collective performance of CERP and non-CERP projects in the basin as related to the Congressionally authorized project purposes – phosphorus load reductions and flood flow attenuation.
   - Measure discharges from the basin
   - Measure phosphorus loads from the basin

2. Guide the integration of CERP project design with implementation of interagency and private projects. In some basins, Federal and state source control efforts to reduce phosphorus runoff will be adequate and regional water quality treatment facilities will not be necessary. The monitoring system can help focus the design of CERP regional water quality treatment facilities to the basins where there is the greatest need. Although data may not be available during the early planning process, the monitoring system could provide useful data for planning and design of projects that will be implemented later in the program. Following construction of the projects, the system can be used to focus source control efforts towards problem basins.

The project-scale monitoring will provide information for operation and performance assessment of individual Lake Okeechobee Watershed Project STA's, reservoirs, or wetlands. The project-scale monitoring will also address all parameters that might be required for permitting, including other water

quality parameters, biologic measures, etc. The details of this monitoring will be formulated in the PIR.

8.0 Project Schedule

The schedule can be found in Appendix D. The schedule corresponds to the levels of the Work Breakdown Structure and identifies milestones. Additional levels of the schedules shall be developed as required and shall all be compatible with each other, the project summary schedule, and the WBS.

8.1 Logic Network Analysis

The Project Delivery Team utilized an automated critical path method network analysis system to develop a logic network for the project schedule. The SFWMD and the USACE will utilize common software to the fullest extent possible to ease the data sharing and reporting. The schedule identifies the critical path (the sequence of activities that require the minimum time for the project to complete). A logic network was developed and includes all activities identified during the WBS analysis, the associated dependencies, and other associated activity data. The logic network will be included in Appendix D, Tab A, of the Project Management Plan.

8.2 Program Guidance

The Project Delivery Team developed a list of project activities that will be performed with a description of each activity and the initial duration estimate. The list of activities was the result of the analysis performed during the Work Breakdown Structure development and was sequenced in a logical progression to identify and document the interdependency of activities. Duration estimates for each activity were calculated based on estimates of time required to successfully complete each activity. During the estimating process, the Project Delivery Team considered project constraints and assumptions, resource requirements and capabilities, and available historical information. All assumptions made during the estimating process are documented in Appendix C, Tab A, of the Project Management Plan.

8.3 Project Schedule

A project schedule was developed using the logic network, duration estimates, constraints and assumptions along with available resource information (time, money, manpower) as noted in the project dictionary.
The schedule is included in Appendix D.

9.0 Financial Management

9.1 Cost Estimates

A planning level cost estimate for the LOWP is provided in Appendix E.

9.2 Budget

Project budgeting involves allocating the overall cost estimate to individual activities so that project cost performance may be measured. The project budget was developed using the cost estimates, Work Breakdown Structure, and project schedule. The project budget, as identified in the Restudy, will be included along with applicable documentation in Appendix E of the Project Management Plan.

WRDA 2000 provides contingent authorization for the Taylor Creek and Nubbin Slough portion of the project. The remaining three elements will be authorized by Congress under future WRDA's. Periodic updates and revisions to the project budget will be required during the course of the project. It is assumed a semiannual revision will be made to the budget throughout the project.

10.0 Summary of Work-In-Kind Services

The Design Agreement allows for In-Kind services by the local sponsor – in this case SFWMD. A detailed listing of In–Kind services is provided in Appendix F.

11.0 Performance Measurement

This section is reserved for documents that will be developed and made available at a later date.

12.0 Project Management Plan Change Control Procedures

This section will contain the changes to the Project Management Plan listed chronologically.

The LOWP project progress (in terms of deliverables, cost and schedule) will be monitored using performance report forms with the goal of identifying changes as soon as possible and forecasting new schedules and/or costs. If changes in scope are identified, the documentation and approval process prescribed by ER 7-7-1 will be utilized. A Project Schedule and Cost Change Request (SACCR) Form will be the instrument for documenting and obtaining approval for changes. Changes in project cost will be tracked using the Contingency Management Report. Increases in the project cost estimate (for which an approved SACCR has been obtained) will be offset by an equal reduction in the available project contingency. The approval authority for utilizing contingency is prescribed in ER 5-7-1. Changes that will result in the estimated project cost (including contingencies) exceeding the baseline cost estimate will require approval by the Director of Civil Works. If the cost estimate is projected to exceed the baseline estimate by more than 20%, a Post Authorization Change will be required and will be submitted to higher authority and Congress for approval.

13.0 Project Closeout Procedures

After final inspection and acceptance of the project, property transfer documents will be prepared to transfer the completed works to the SFWMD as the non-federal sponsor. These documents will identify the completed works, any associated items such as O&M manuals that will accompany the works, any outstanding deficiencies, any remaining warranties, and the effective date of the transfer. This will occur as soon as practical following completion of construction of the project. The USACE will process documents such as the final pay estimate and contractor evaluation required for closing the applicable construction contract. Cost of the operations and maintenance of each completed functional project segment will be borne according to the provisions of the PCA unless superceded by changes in applicable federal law.

The USACE will review the report of audit done on the sponsor's records for all project costs to be applied as credits. The sponsor may likewise review the audit of USACE records to ascertain the completeness and validity of expenditures. Based upon final accounting of all project costs, the final apportionment of project costs between the Federal government and the local sponsor will be made in accordance with the stipulations of the PCA. Following final adjustments, any excess funds contributed by the SFWMD will be returned to the sponsor and the letter of credit or escrow account will be terminated.

14.0 Approval

Log of Lake Okeechobee
Watershed Project Plan Approval

Initial Approval	Joseph A. Schweigart, P.E. Deputy Executive Director, Everglades Restoration, SFWMD	7/19/01 Date
	Henry Dean Executive Director, SFWMD	7/20/01 Date
	Richard E. Bonner, P.E. Deputy District Engineer, USACE	8/01/01 Date

15.0 Appendices

Appendix A: List of Project Delivery Team Members
Appendix B: Project Maps
Appendix C: Work Breakdown Methodology
Appendix D: Project Schedule
Appendix E: Project Cost Estimate
Appendix F: Summary Work In Kind Services
Appendix G: Performance Measurement
Appendix H: Real Estate Plan
Appendix I: Acquisition Plan
Appendix J: Quality Control Plan
Appendix K: Public Involvement
Appendix L: Value Engineering Plan
Appendix M: Water Control Plan
Appendix N: Water Quality Certification
Appendix O: Operations and Maintenance
Appendix P: Environmental and Economic Equity Plan
Appendix Q: Restoration and Coordination and Verification Integration Plan
Appendix R: Project Cooperation Agreement
Appendix S: Permitting and Monitoring Plan
Appendix T: Reference Documents and Forms
Appendix U: Construction Management
Appendix V: Advanced Plan Formulation
Appendix W: Engineering and Design
Appendix X: Hydrology and Hydraulics
Appendix Y: Environmental Compliance
Appendix Z: United States Fish and Wildlife Service Coordination
Appendix AA: Project Management

Appendix A: List of Project Delivery Team Members

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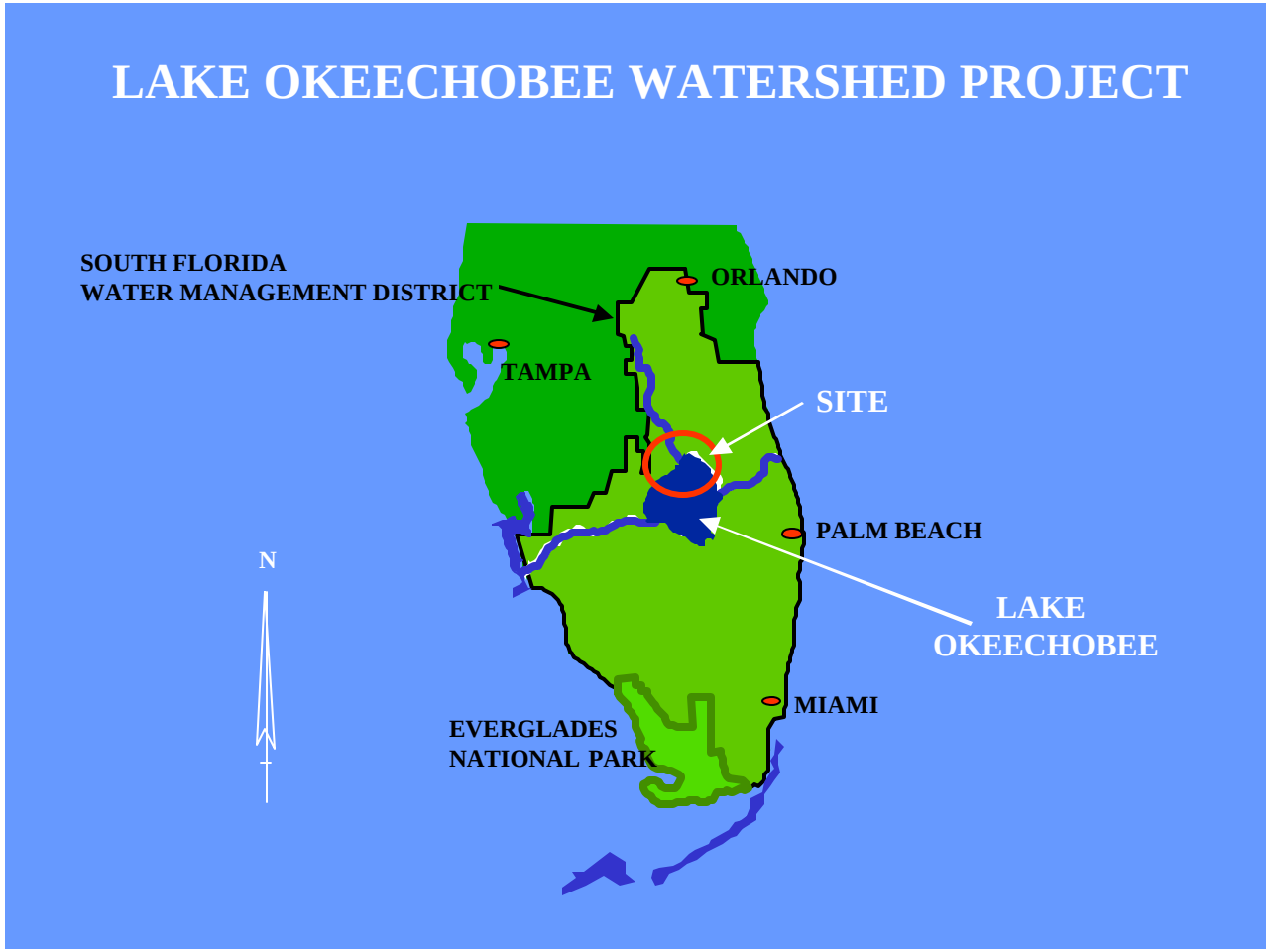
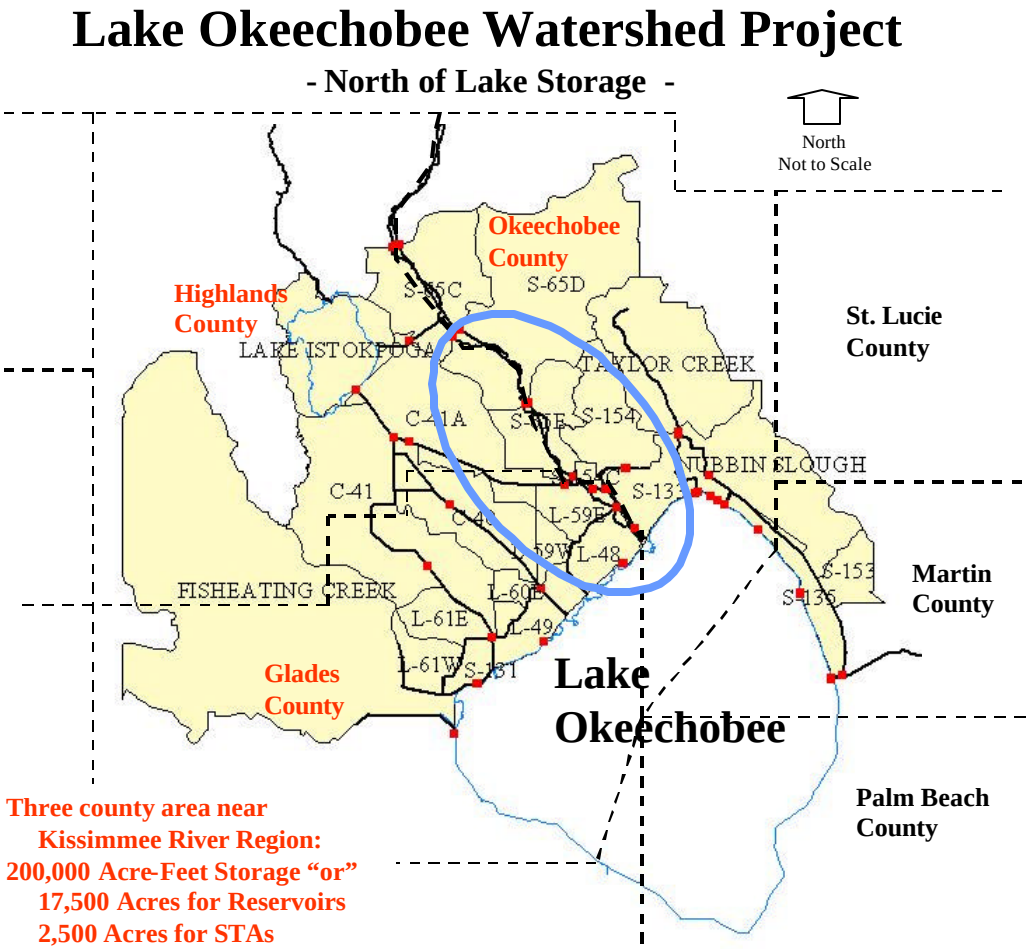
Appendix B: Project Map

Project Location Map

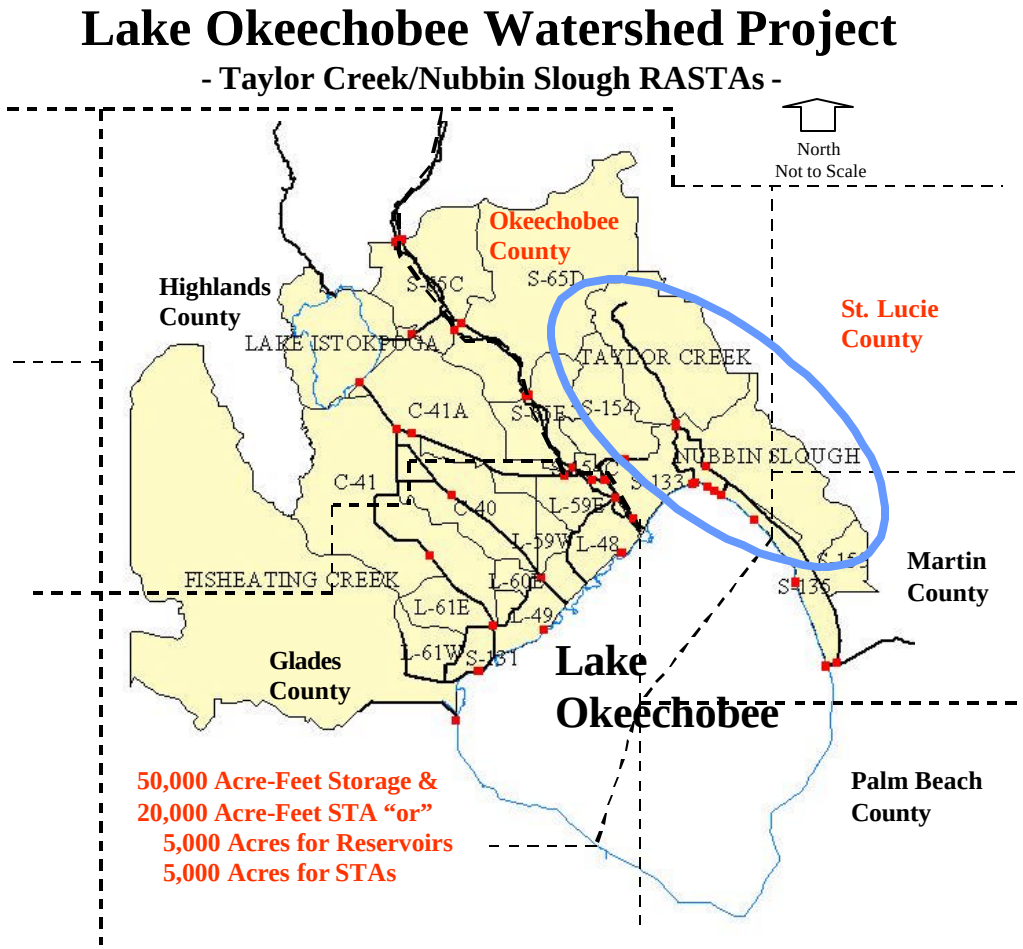


Lake Okeechobee Vicinity Map

North of Lake Storage



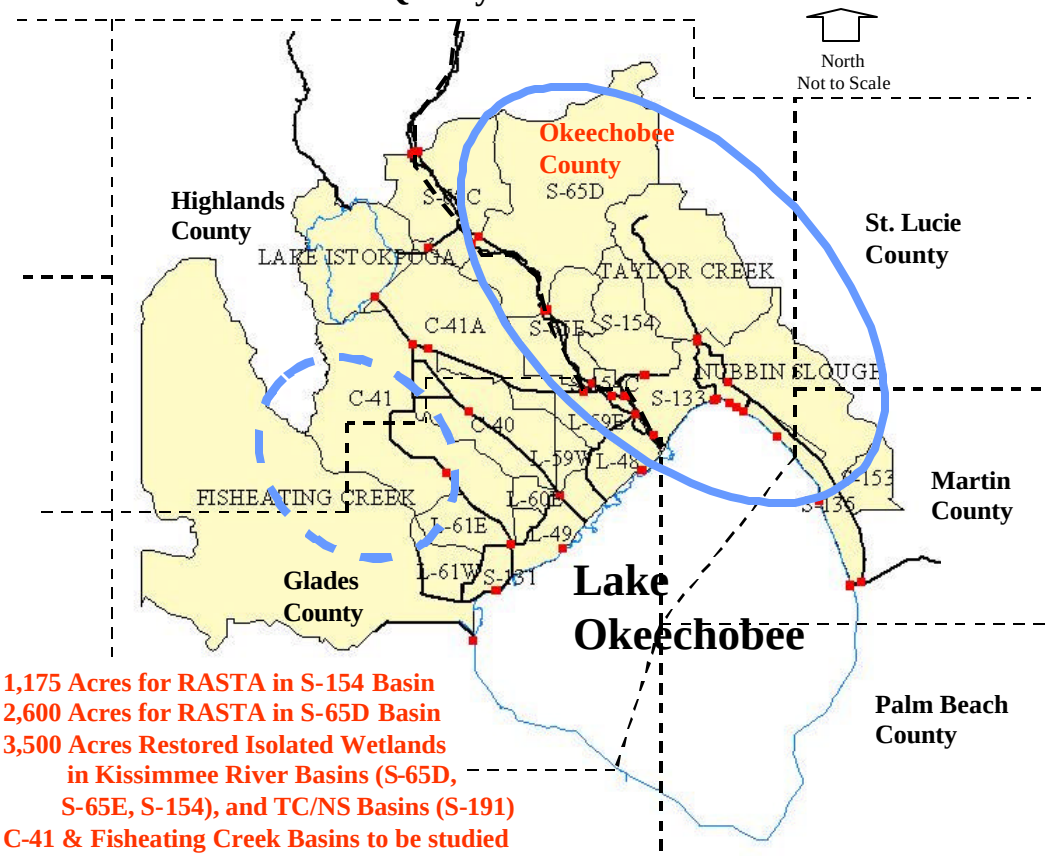
Taylor Creek/Nubbin Slough STAs



Lake Okeechobee Water Quality Treatment Facilities

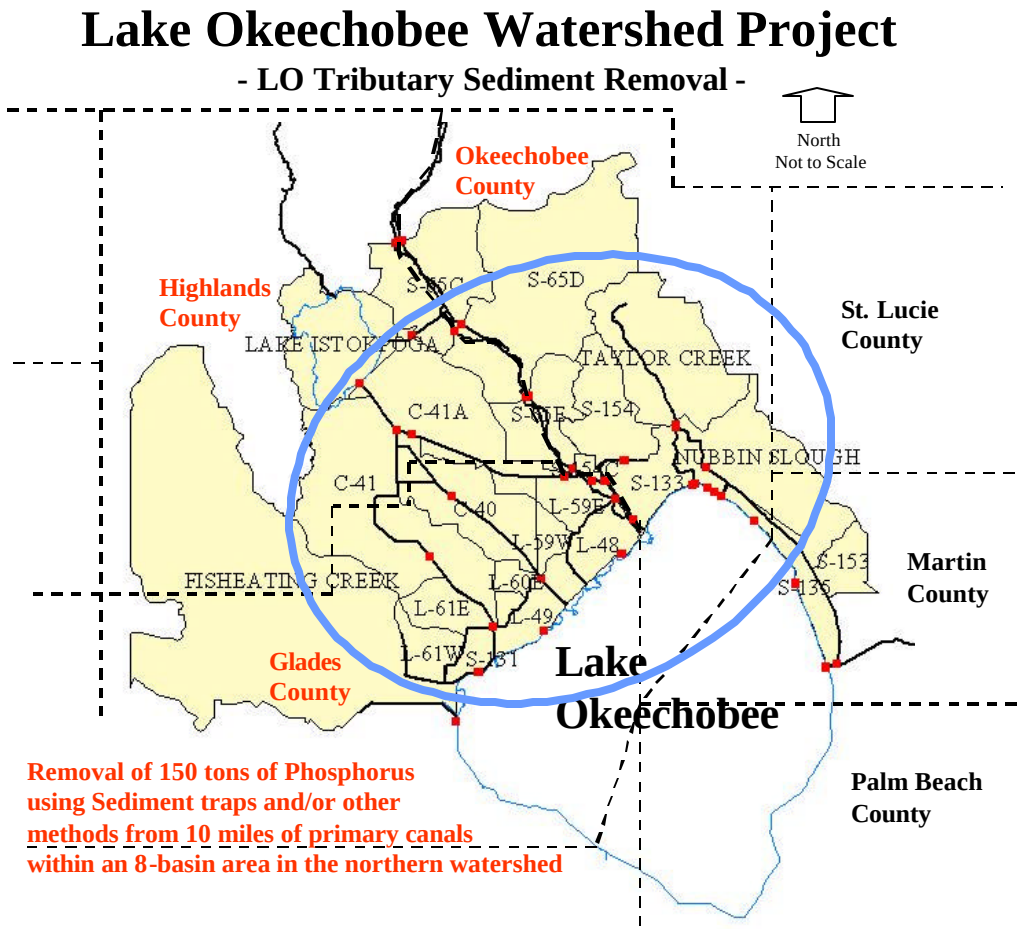
Lake Okeechobee Watershed Project

- LO Water Quality Treatment Facilities -

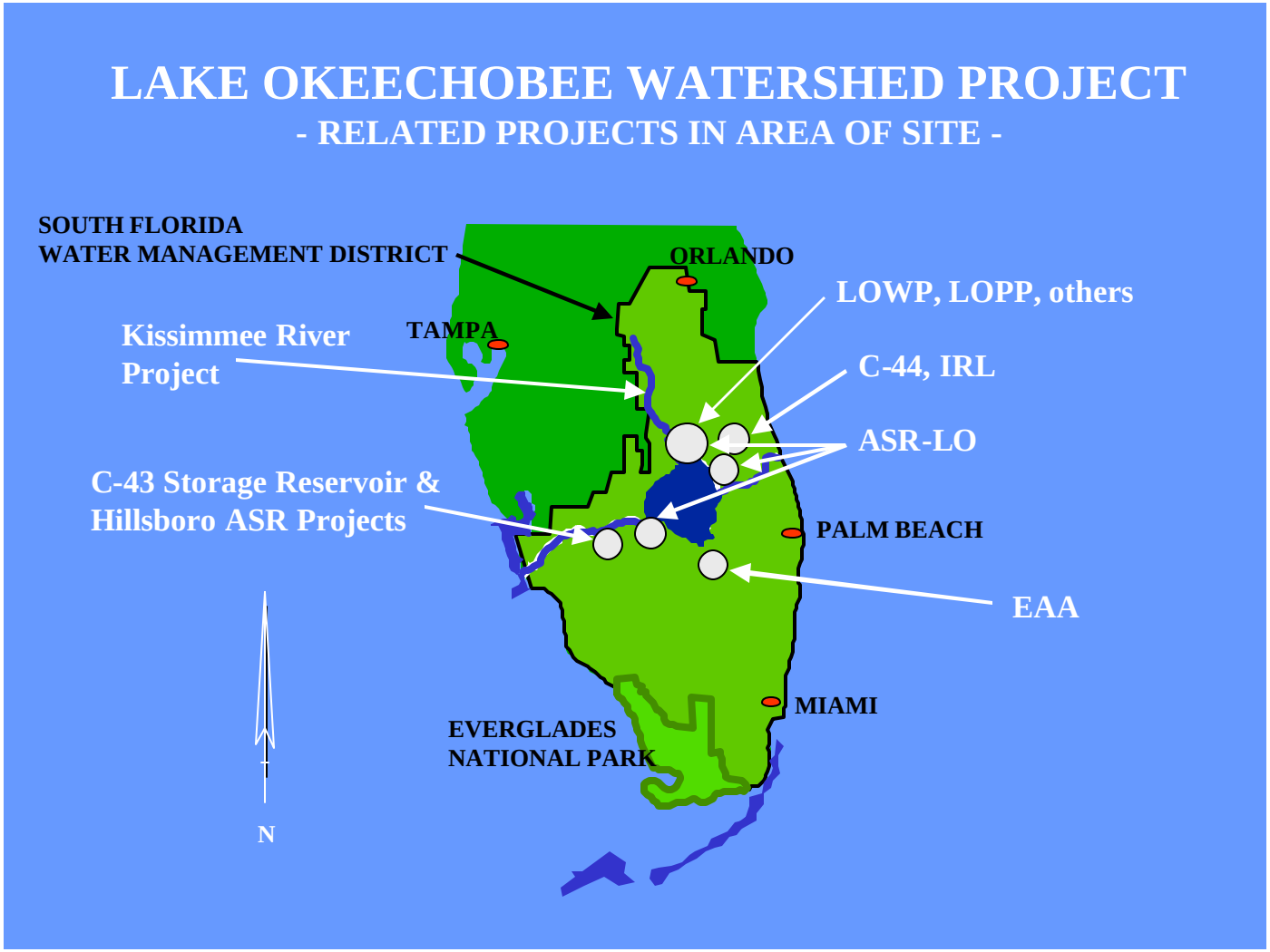


1,175 Acres for RASTA in S-154 Basin
2,600 Acres for RASTA in S-65D Basin
3,500 Acres Restored Isolated Wetlands in Kissimmee River Basins (S-65D, S-65E, S-154), and TC/NS Basins (S-191)
C-41 & Fisheating Creek Basins to be studied

Lake Okeechobee Tributary Sediment Removal



Related Projects Within Area of Site



Appendix C: Work Breakdown Methodology

TAB A of Appendix C – Work Breakdown Structure Activity Listing

Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1040	PMP Project Management	1d	03/08/01	03/08/01	
01-1050	Project Information	1d	03/08/01	03/08/01	
01-1060	Project Scope	1d	03/08/01	03/08/01	
01-1070	Work Breakdown Structure	1d	03/08/01	03/08/01	
01-1080	Organization Breakdown Structure	1d	03/08/01	03/08/01	
01-1090	Change Control Procedures	1d	03/08/01	03/08/01	
01-1100	Project Schedule Development	1d	03/09/01	03/09/01	01-1050, 01-1060, 01-1070, 01-1080
01-1110	Project Cost Estimate	1d	03/12/01	03/12/01	01-1100
01-1120	Funding Requirements	1d	03/13/01	03/13/01	01-1110
01-1130	Functional Area Plans	1d	03/12/01	03/12/01	01-1100
01-1150	Draft PMP	1d	03/14/01	03/14/01	01-1090, 01-1120, 01-1130
01-1160	Corps Approval PMP	84d	03/15/01	07/12/01	01-1150
01-1170	SFWMD Approval PMP	84d	03/15/01	07/12/01	01-1150
01-1173	Planning Tech Lead - Watershed Assess	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1175	Proj Mgt - Watershed Assess - Corps	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1177	Proj Mgt - Watershed Assess - SFWMD	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1178	RECOVER - Watershed Assess - PDT participat...	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1180	Scope of Work AE Contract - Corps	22d	07/13/01	08/14/01	01-1040, 01-1160, 01-1170
01-1182	Scope of Work AE Contract - SFWMD	22d	07/13/01	08/13/01	01-1040, 01-1160, 01-1170
01-1190	Gov't Estimate SFWMD	10d	08/14/01	08/28/01	01-1180, 01-1182
01-1192	Review Gov't Est Corps	10d	08/14/01	08/28/01	01-1180, 01-1182
01-1200	Procurement AE contract	66d	08/28/01	12/05/01	01-1190, 01-1192
01-1208	Water Quality Design Criteria Contract	66d	12/05/01	03/13/02	01-1200
01-1210	Water Quality Design Criteria SFWMD	66d	12/05/01	03/13/02	01-1200
01-1218	Water Quality Design Criteria - Corps	66d	12/05/01	03/13/02	01-1200
01-1220	Land use & soil data	22d	12/05/01	01/08/02	01-1200
01-1230	Describe WQ & flow monitoring system	22d	12/05/01	01/08/02	01-1200
01-1240	Lit review - sedimentation/other info	22d	12/05/01	01/08/02	01-1200
01-1250	Rainfall frequency analysis	22d	12/05/01	01/08/02	01-1200
01-1260	Future land use projections	44d	12/05/01	02/08/02	01-1200

TASK filter: All Activities

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1270	P Settling Rate	22d	12/05/01	01/08/02	01-1200
01-1271	Draft Performance Measure Corps	44d	12/05/01	02/08/02	01-1200
01-1272	Draft Performance Measures Contractor	44d	12/05/01	02/08/02	01-1200
01-1273	Draft Performance Measures SFWMD	44d	12/05/01	02/08/02	01-1200
01-1274	PDT Performance Measure Review SFWMD	40d	02/08/02	04/08/02	01-1271, 01-1272, 01-1273
01-1275	PDT Performance Measure Review Corps	44d	02/08/02	04/12/02	01-1271, 01-1272, 01-1273
01-1276	Perf Measure/Scoping Public Workshop	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1277	Perf Measure/Scoping Public Mtg Corps	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1279	Finalize Performance Measures	44d	05/14/02	07/17/02	01-1276, 01-1277, 01-1278, 01-1281
01-1280	Tributary basin boundary delineation	90d	12/05/01	04/16/02	01-1200
01-1281	In Progress Review - Scoping	22d	05/14/02	06/14/02	01-1276, 01-1277, 01-1278
01-1290	Identify Pilot Tributaries	10d	01/08/02	01/23/02	01-1220, 01-1230, 01-1240
01-1300	Determine base flow @ structures	10d	01/23/02	02/06/02	01-1290
01-1302	Select analytical method SFWMD	10d	02/06/02	02/21/02	01-1300
01-1305	Select analytical method Corps	10d	02/06/02	02/21/02	01-1300
01-1310	Select analytical method Contractor	10d	02/06/02	02/21/02	01-1300
01-1320	Base flow estimate - pilot tribs	10d	02/21/02	03/07/02	01-1260, 01-1302, 01-1305, 01-1310
01-1330	Storm runoff computations - pilot tribs	10d	02/21/02	03/07/02	01-1250, 01-1260, 01-1302, 01-1305, 01-1310
01-1340	P load estimates - base flow - pilot tribs	10d	03/07/02	03/21/02	01-1320
01-1350	P load estimates - storm flow - pilot tribs	10d	03/07/02	03/21/02	01-1330
01-1360	Bypass flow estimates - pilot tribs	10d	03/21/02	04/04/02	01-1208, 01-1210, 01-1218, 01-1270, 01-1340, 01-1350
01-1370	Storage needs - pilot tribs	10d	03/21/02	04/04/02	01-1208, 01-1210, 01-1218, 01-1270, 01-1340, 01-1350
01-1373	Tech review - pilot trib analysis Corps	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1376	Tech review - pilot trib analysis SFWMD	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1380	Technical review - pilot tribs analysis	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1390	Base flow estimates - all tribs	66d	05/06/02	08/08/02	01-1280, 01-1373, 01-1376, 01-1380
01-1400	Storm runoff estimates - all tribs	66d	05/06/02	08/08/02	01-1280, 01-1373, 01-1376, 01-1380
01-1410	Base flow P loads - all Tribs	44d	08/08/02	10/10/02	01-1390
01-1420	Storm runoff P loads - all Tribs	44d	08/08/02	10/10/02	01-1400
01-1430	Storage needs - all Tribs	66d	10/10/02	01/21/03	01-1410, 01-1420
01-1440	Bypass estimates - all Tribs	66d	10/10/02	01/21/03	01-1410, 01-1420
01-1450	Data Model Development	44d	12/05/01	02/08/02	01-1200
01-1460	Data Model scenario runs	22d	01/21/03	02/21/03	01-1430, 01-1440, 01-1450
01-1470	PIR Work Plan	44d	01/21/03	03/25/03	01-1430, 01-1440

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1480	Draft Assessment Report	22d	02/21/03	03/25/03	01-1279, 01-1460, 01-1470, 01-1700
01-1485	PDT review - Draft Assess Rpt SFWMD	22d	03/25/03	04/24/03	01-1480
01-1490	PDT review - Draft Assess Rpt Corps	22d	03/25/03	04/24/03	01-1480
01-1492	Public Workshop - Draft Assess Rpt Corps	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1500	Independent Tech Review - Assessment Rpt	10d	05/08/03	05/22/03	01-1492, 01-1493, 01-1495
01-1510	Final Assessment Report	44d	05/22/03	07/25/03	01-1178, 01-1500
01-1513	PMP Update - Assess Phase Corps	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1516	PMP Update - Assess Phase SFWMD	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1520	PMP Update - Assess Phase Contract	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1522	RECOVER - TC/NS Participation	330d	07/25/03	11/18/04	01-1513, 01-1516, 01-1520
01-1525	Cooperative Agreement w/ USGS (Corps)	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1527	Cooperative Agreement w/USGS (SFWMD)	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1528	Define monitoring objectives SFWMD	10d	07/13/01	07/26/01	01-1160, 01-1170
01-1529	Define monitoring objectives USGS	10d	07/13/01	07/26/01	01-1160, 01-1170
01-1530		10d	07/13/01	07/26/01	01-1160, 01-1170
01-1531	RECOVER - Monitoring Design participation	100d	07/27/01	12/20/01	01-1528, 01-1529, 01-1530
01-1532	Monitoring Design/Imp Coordination	2600d	10/31/01	03/29/12	01-1525, 01-1527
01-1534	Monitoring Design/Imp Coordination Corps	2600d	10/31/01	03/30/12	01-1525, 01-1527
01-1535	TCNS PIR Proj Mgt - Corps	550d	07/25/03	10/05/05	01-1520
01-1537	TCNS PIR Proj Mgt - SFWMD	550d	07/25/03	10/05/05	01-1520
01-1538	Pln Tech Lead - TCNS	550d	07/25/03	10/05/05	01-1520
01-1540	Identify potential monitoring sites	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1550	Site & parameter selection	44d	10/31/01	01/07/02	01-1540
01-1560	Monitoring site design	22d	01/08/02	02/07/02	01-1550
01-1570	Cost estimate for network	22d	02/08/02	03/12/02	01-1531, 01-1560
01-1572	RECOVER Monitoring Plan Review	22d	03/13/02	04/11/02	01-1570
01-1573	Monitoring Network Design Approval - Corps	44d	04/12/02	06/13/02	01-1572
01-1574	Monitoring Network Design Approval - SFWMD	44d	04/12/02	06/13/02	01-1572
01-1575	Obtain Real Estate for Gages SFWMD	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1577	Obtain Real Estate for Gages Corps	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1580	Obtain real estate USGS	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1590	Purchase equipment	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1600	Purchase supplies & materials	44d	06/14/02	08/15/02	01-1573, 01-1574

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1610	Construction of monitoring sites	132d	10/21/02	05/01/03	01-1575, 01-1577, 01-1580, 01-1590, 01-1600
01-1620	Post-construction tasks	33d	05/02/03	06/18/03	01-1610
01-1630	Monitoring Network Ops - establish schedules	10d	06/14/02	06/27/02	01-1573, 01-1574
01-1640	Operations Plans & Quality Assurance	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1650	Monitoring site maintenance & repair	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1660	Discharge measurements/WQ sonde maintenance	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1670	Auto-sampler servicing	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1680	Water Quality Sampling	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1690	Sediment sampling	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1700	Existing level of flood protection	44d	01/08/02	03/13/02	01-1250
01-1710	Data collection ET	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1720	Data processing - stream flow	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1730	Processing continuous WQ data	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1740	Shipment of samples to laboratory	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1750	Review lab results	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1755	Data Interpretation and reporting	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1760	Provide data	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1761	Topo Data Collection - TCNS	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-1762	Geotech Data Collection - TCNS	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-1763	Initial Alternative Plans - TCNS Corps	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1767	Inital Alternative Plans - TCNS SFWMD	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1770	Initial Alternative Plans - TCNS Contractor	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1771	Real estate data collection - TCNS	22d	07/25/03	08/26/03	01-1513, 01-1516, 01-1520
01-1772	Plan formulation - economics input - TCNS	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWMD	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1780	Final Alternative Plans - TCNS	22d	10/29/03	12/03/03	01-1771, 01-1773, 01-1775, 01-1777
01-1790	Alternative Descriptions - TCNS	22d	12/03/03	01/06/04	01-1780
01-1795	PDT Alt Plan comments - TCNS SFWMD	22d	01/06/04	02/06/04	01-1790
01-1800	PDT Alt Plan Comments - TCNS Corps	22d	01/06/04	02/06/04	01-1790
01-1805	Alt Form Briefing - TCNS	10d	02/06/04	02/23/04	01-1795, 01-1800
01-1810	Final Alternative Plan Document - TCNS	22d	02/23/04	03/24/04	01-1795, 01-1800, 01-1805
01-1820	Alt Plan Conceptual Design - TCNS	44d	03/24/04	05/25/04	01-1761, 01-1762, 01-1810
01-1830	Alt Plan Cost Estimates - TCNS	44d	05/25/04	07/28/04	01-1820

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1840	H&H Evaluation of Alternative Plans - TCNS	44d	03/24/04	05/25/04	01-1761, 01-1762, 01-1810
01-1850	Socio-Economic Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1860	Real Estate Cost Est Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1870	Environmental Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1880	Draft Alt Plan Evaluation Document - TCNS	22d	08/27/04	09/29/04	01-1830, 01-1850, 01-1860, 01-1870
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFWMD	22d	09/29/04	11/01/04	01-1880, 01-1920, 01-1930, 01-1940, 01-1950, 01-1958
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corps	22d	09/29/04	11/01/04	01-1880, 01-1920, 01-1930, 01-1940, 01-1950, 01-1958
01-1900	Independent Tech Review - Evaluation Doc - TC...	22d	11/01/04	12/06/04	01-1885, 01-1890
01-1910	Final Evaluation Document - TCNS	22d	12/06/04	01/07/05	01-1900
01-1920	Environmental Eval Appendix - TCNS	22d	08/27/04	09/29/04	01-1870
01-1930	Eng & Design Appendix - TCNS	22d	07/28/04	08/27/04	01-1830, 01-1840
01-1940	Socio-Economic Appendix - TCNS	22d	08/27/04	09/29/04	01-1850
01-1950	Real Estate Appendix - TCNS	22d	08/27/04	09/29/04	01-1860
01-1956	Endangered Species Consultation - TCNS	65d	03/24/04	06/24/04	01-1810
01-1957	Draft Fish & Wildlife Coord Act Report - TCNS	98d	03/24/04	08/11/04	01-1810
01-1958	Draft water control plan - TCNS	22d	05/25/04	06/25/04	01-1840
01-1959	Cultural Resources Initial Assessment - TCNS	120d	03/24/04	09/13/04	01-1810
01-1960	Draft Report - TCNS	22d	01/07/05	02/09/05	01-1522, 01-1910, 01-1920, 01-1930, 01-1940, 01-1950, 01-1957, 01-1958, 01-1959
01-1961	RECOVER review Draft Report - TCNS	22d	02/09/05	03/14/05	01-1960
01-1962	Final FWS - CAR - TCNS	80d	08/11/04	12/08/04	01-1957
01-1963	PDT Review Draft Report - TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1966	PDT Review Draft Report - TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-1968	TCNS Final Deliverable Draft Report	22d	02/09/05	03/14/05	01-1960
01-1970	Public Review DEIS - TCNS	66d	03/14/05	06/15/05	01-1963, 01-1966, 01-1968
01-1975	PDT Comparison Alt Plans - TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-1980	PDT Comparison Alt Plans - TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22d	02/09/05	03/14/05	01-1960
01-1993	Pub Wkshp - Draft Report TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-2003	Final Draft Report TCNS Corps	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996, 01-2033, 01-1962
01-2006	Final Draft Report TCNS SFWMD	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996, 01-2033, 01-2034, 01-1..
01-2010	Public Review - Final Report - TCNS	44d	08/17/05	10/20/05	01-2003, 01-2006, 01-1956
01-2013	Pub Wkshp - Final Report - TCNS Corps	22d	08/17/05	09/19/05	01-2003, 01-2006
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22d	08/17/05	09/19/05	01-2003, 01-2006
01-2023	ROD - TCNS Corps	44d	10/20/05	12/27/05	01-2010, 01-2013, 01-2016

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2030	ROD - TCNS SFWMD	44d	10/20/05	12/27/05	01-2010, 01-2013, 01-2016
01-2033	TCNS PIR update of PMP SFWMD	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996
01-2034	TCNS PIR update of PMP Corps	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996
01-2035	Congressional Committee Approval - TCNS	176d	12/27/05	09/07/06	01-1535, 01-1537, 01-1538, 01-2023, 01-2030
01-2036	RECOVER - LO PIR participation	500d	07/25/03	07/26/05	01-1513, 01-1516, 01-1520
01-2037	Initial Alternative Plans - LO Corps	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2038	Initial Alternative Plans - LO SFWMD	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2039	Plan formulation - economics input - LO	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-2040	Initial Alternative Plans - LO Contractor	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2041	Topo Data collection - LO	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-2042	Geotech Data collection - LO	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-2043	Public Workshop - Alt Plans - LO Corps	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2046	Public Workshop - Alt Plans - LO SFWMD	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2050	Public Workshop - Alt Plans - LO Contractor	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2051	Real estate data collection - LO	22d	07/25/03	08/26/03	01-1513, 01-1516, 01-1520
01-2052	LO PIR Proj Mgt - Corps	1300d	07/25/03	10/06/08	01-1520
01-2054	LO PIR Proj Mgt - SFWMD	1300d	07/25/03	10/06/08	01-1520
01-2055	Plan Tech Lead - LO PIR	1300d	07/25/03	10/06/08	01-1520
01-2060	Final Alt Plans - LO	44d	12/03/03	02/06/04	01-2043, 01-2046, 01-2050, 01-2051
01-2070	Alt Plan Descriptions - LO	66d	02/06/04	05/11/04	01-2060
01-2075	PDT Review Alt Plans - LO SFWMD	22d	05/11/04	06/11/04	01-2070
01-2080	PDT Review Alt Plans - LO Corps	22d	05/11/04	06/11/04	01-2070
01-2085	Alt Form Briefing - LO	10d	06/11/04	06/25/04	01-2075, 01-2080
01-2090	Final Alt Plan Document - LO	22d	06/25/04	07/28/04	01-2075, 01-2080, 01-2085
01-2091	Cultural Resources Initial Assessment - LO	120d	07/28/04	01/24/05	01-2090
01-2100	Alt Plan Conceptual Design - LO	88d	07/28/04	12/06/04	01-2041, 01-2042, 01-2090
01-2110	Alt Plans Cost Estimates - LO	66d	12/06/04	03/14/05	01-2100
01-2120	H&H Evaluation of Alt Plans - LO	88d	07/28/04	12/06/04	01-2041, 01-2042, 01-2090
01-2130	Socio-Economic Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2140	Real Estate Cost Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2150	Environmental Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2160	Draft Alt Plan Evaluation Document - LO	22d	04/13/05	05/13/05	01-2110, 01-2130, 01-2140, 01-2150, 01-2237
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWMD	22d	05/13/05	06/15/05	01-2160, 01-2200, 01-2210, 01-2220, 01-2230, 01-2237
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22d	05/13/05	06/15/05	01-2160, 01-2200, 01-2210, 01-2220, 01-2230, 01-2237
01-2180	ITR Alt Plan Evaluation - LO	22d	06/15/05	07/18/05	01-2165, 01-2170

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2190	Final Alt Plan Evaluation Report - LO	22d	07/18/05	08/17/05	01-2180
01-2200	Evironmental Evaluation App - LO	22d	04/13/05	05/13/05	01-2150
01-2210	Eng & Design Appendix - LO	22d	03/14/05	04/13/05	01-2110, 01-2120
01-2220	Socio-Economic Evaluation Appendix - LO	22d	04/13/05	05/13/05	01-2130
01-2230	Real Estate Evaluation Appendix - LO	22d	04/13/05	05/13/05	01-2140
01-2233	Endangered Species Consultation - LO	64d	07/28/04	10/28/04	01-2090
01-2234	Draft Fish & Wildlife Coord Act Report - LO PIR	220d	07/28/04	06/15/05	01-2090
01-2236	Final FWS - CAR - LO	10d	06/15/05	06/29/05	01-2234
01-2237	Draft water control plan - LO	44d	12/06/04	02/09/05	01-2120
01-2240	Draft PIR/EIS - LO	22d	08/17/05	09/19/05	01-2036, 01-2190, 01-2200, 01-2210, 01-2220, 01-2230, 01-2233, 01-2234, 01-2237, 01-2..
01-2241	RECOVER Review Draft PIR/EIS - LO	22d	09/19/05	10/20/05	01-2240
01-2243	PDT Review Draft PIR/EIS - LO Corps	44d	09/19/05	11/22/05	01-2240
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44d	09/19/05	11/22/05	01-2240
01-2248	Final Deliverable Draft PIR/EIS - LO	44d	09/19/05	11/22/05	01-2240
01-2250	Public Review Draft PIR/EIS - LO	66d	11/22/05	03/02/06	01-2248, 01-2241, 01-2243, 01-2246
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22d	11/22/05	12/27/05	01-2243, 01-2246, 01-2248
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22d	11/22/05	12/27/05	01-2243, 01-2246, 01-2248
01-2273	Final Draft PIR/EIS - LO Corps	44d	03/02/06	05/03/06	01-2253, 01-2256, 01-2250, 01-2236
01-2276	Final Draft PIR/EIS - LO SFWMD	44d	03/02/06	05/03/06	01-2253, 01-2256, 01-2250, 01-2236
01-2277	LO PIR PMP update Corps	66d	05/03/06	08/07/06	01-2273, 01-2276
01-2278	LO PIR PMP update SFWMD	66d	05/03/06	08/07/06	01-2273, 01-2276
01-2290	Public Review Final PIR/EIS	44d	05/03/06	07/06/06	01-2273, 01-2276
01-2301	Public Workshop - Final PIR/EIS - LO SFWMD	22d	05/03/06	06/05/06	01-2273, 01-2276
01-2302	Public Workshop - Final PIR/EIS - LO Corps	22d	05/03/06	06/05/06	01-2273, 01-2276
01-2303	ROD - LO SFWMD	44d	07/06/06	09/07/06	01-2301, 01-2302, 01-2290
01-2310	ROD - LO Corps	44d	07/06/06	09/07/06	01-2301, 01-2302, 01-2290
01-2320	DDR - TCNS	242d	08/17/05	08/07/06	01-2003, 01-2006
01-2330	DDR - LO	455d	09/07/06	07/03/08	01-2277, 01-2278, 01-2303, 01-2310
01-2340	Congressional Authorization - LO	264d	10/06/08	10/27/09	01-2052, 01-2054, 01-2055, 01-2303, 01-2310
01-2350		150d	08/07/06	03/16/07	01-2320
01-2360	Real Estate Acquisition - LO	300d	07/03/08	09/15/09	01-2330
01-2370	Plans & Specs - TCNS	242d	08/07/06	07/26/07	01-2320
01-2380	Plans & Specs - LO	350d	07/03/08	11/30/09	01-2330
01-2390	PCA - TCNS	66d	09/07/06	12/14/06	01-2035
01-2400	PCA - LO	66d	10/27/09	02/04/10	01-2340

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2410	Construction - TCNS	482d	07/26/07	06/30/09*	01-2350, 01-2370, 01-2390
01-2420	Constructon - LO	850d	02/04/10	06/27/13	01-2340, 01-2360, 01-2380, 01-2400

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Backup of Work Breakdown Structure

WBS	Activity Id	Title	Description	Assumptions
1.1.09.1.3	2033	TCNS PIR update of PMP SFWMD	After the PIR is complete, it will be possible to provide more detail to the work products that will be required for P&S, construction, and O&M. This detail will be incorporated in the revision of the PMP.	
1.1.09.1.3	2034	TCNS PIR update of PMP USACE		
1.1.09.1.3	2277	LO PIR PMP update USACE	After the PIR is complete, the PMP will be updated to include detailed activities, schedule, and cost for preparation of detailed design.	
1.1.09.1.3	2278	LO PIR PMP update SFWMD		
1.1.09.2.1	1175	Proj Mgt - Watershed Assess - USACE	This activity includes all USACE and SFWMD project management functions throughout the Watershed Assessment.	
1.1.09.2.1	1177	Proj Mgt - Watershed Assess - SFWMD		
1.1.09.2.1	1180	Scope of Work AE Contract - USACE	Development of a scope of work to be used for contracting AE work that will assist in the preparation CERP components. (who will do work; what needs to be done; one, two, or three separate work items)	
1.1.09.2.1	1182	Scope of Work AE Contract - SFWMD		
1.1.09.2.1	1190	Gov't Estimate SFWMD	Cost estimate for the scope of AE services will be used for budgeting and negotiations for contract.	The AE contract will be awarded by SFWMD, therefore, the cost estimate will be prepared by SFWMD.
1.1.09.2.1	1192	Review Gov't Est USACE	The USACE will review and concur with the cost estimate prepared by the USACE.	
1.1.09.2.1	1200	Procurement AE contract	All actions required to advertise, review proposals, select contractor, negotiate costs, award, and Governing Board approval	
1.1.09.2.1	1525	Cooperative Agreement w/ USGS (USACE)	A scope of work and a cooperative agreement will be developed with the USGS	The USGS has the resources available to perform this work.

1.1.09.2.1	1527	Cooperative Agreement w/USGS (SFWMD)	for design, implementation, and operation of a basin-scale monitoring system.	SFWMD will provide assistance.
1.1.09.2.1	1535	TCNS PIR Proj Mgt - USACE	All project management actions required during the PIR for Taylor Creek/Nubbin Slough.	
1.1.09.2.1	1537	TCNS PIR Proj Mgt - SFWMD		
1.1.09.2.1	2052	LO PIR Proj Mgt - USACE	All project management actions required during the PIR for the Lake Okeechobee projects.	
1.1.09.2.1	2054	LO PIR Proj Mgt - SFWMD		
1.1.09.2.2.01.01	1178	RECOVER - Watershed Assessment PDT participation	A RECOVER representative will participate throughout the Watershed Assessment phase.	
1.1.09.2.2.01.01	1208	Water Quality Design Criteria Contract	Establishment of an interagency consensus of the water quality design criteria to be used for the design of the STA's.	TMDLs for Lake Okeechobee and tributaries should be considered, in addition to the water quality improvements resulting from other non-CERP projects.
1.1.09.2.2.01.01	1210	Water Quality Design Criteria SFWMD		
1.1.09.2.2.01.01	1218	Water Quality Design Criteria - USACE		
1.1.09.2.2.01.01	1220	Land use & soil data	Collect and review available/existing land use and soil data.	
1.1.09.2.2.01.01	1230	Describe WQ & flow monitoring system	Inventory existing water quality and flow monitoring to identify any usefull information.	
1.1.09.2.2.01.01	1240	Lit review - sedimentation/other info	Review all available data on basins for sedimentation, quality, volumes, and other relevant data.	
1.1.09.2.2.01.01	1250	Rainfall frequency analysis	Perform a rainfall frequency analysis to estimate rainfall amounts for various return periods.	

1.1.09.2.2.01.01	1270	P Settling Rate	Review available literature and consult with experts to develop an acceptable initial estimate of the phosphorus settling rate. This will be used to preliminarily design STAs until in situ data has been collected and evaluated.	
1.1.09.2.2.01.01	1280	Tributary basin boundary delineation	Tributary boundaries will be delineated using USGS quad sheets, other available topo data, and field inspections when necessary.	Knowledgeable individuals at the Okeechobee Service Center, the Okeechobee Department, and elsewhere will be consulted.
1.1.09.2.2.01.01	1290	Identify Pilot Tributaries	From 4 major basins, ID 3 representative tributaries to test analytical approaches for estimating runoff and load. If it is determined to be reasonable, the analytical method will be applied to remaining tributaries.	
1.1.09.2.2.01.01	1300	Determine base flow @ structures	Establish seasonal base flow characteristics at Lake Okeechobee structures.	This information will be used in modeling the upstream tributary basins to establish their base flow characteristics.
1.1.09.2.2.01.01	1302	Select analytical method SFWMD	An analytical method for estimating tributary flow volumes and phosphorus loads for base flow and storm conditions will be selected for application to the pilot tributaries.	After application of the analytical method to the pilot tributaries and its evaluation, the method will be applied to the remaining tributaries.
1.1.09.2.2.01.01	1305	Select analytical method USACE		
1.1.09.2.2.01.01	1310	Select analytical method Contractor		
1.1.09.2.2.01.01	1320	Base flow estimate - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate base flow volumes	
1.1.09.2.2.01.01	1330	Storm runoff computations - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate storm runoff volumes	

1.1.09.2.2.01.01	1340	P load estimates - base flow - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate base flow P loads	
1.1.09.2.2.01.01	1350	P load estimates - storm flow - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate storm runoff P loads.	
1.1.09.2.2.01.01	1360	Bypass flow estimates - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate bypass flows.	
1.1.09.2.2.01.01	1370	Storage needs - pilot tribs	The selected analytical method will be applied to the pilot tributaries to estimate storage capacities.	
1.1.09.2.2.01.01	1373	Tech review - pilot trib analysis USACE	The analytical method used for the pilot tributaries will be evaluated to determine its accuracy and efficiency. Any needed modifications to the method will be identified.	If the method is acceptable, it will be applied to the remaining tributaries.
1.1.09.2.2.01.01	1376	Tech review - pilot trib analysis SFWMD		
1.1.09.2.2.01.01	1380	Technical review - pilot tribs analysis - Contractor		
1.1.09.2.2.01.01	1390	Base flow estimates - all tribs	Seasonal base flow estimates will be prepared for all tributaries.	
1.1.09.2.2.01.01	1400	Storm runoff estimates - all tribs	Storm runoff volume estimates will be prepared for all tributaries.	
1.1.09.2.2.01.01	1410	Base flow P loads - all Tribs	Base flow P loads will be estimated for all tributaries.	
1.1.09.2.2.01.01	1420	Storm runoff P loads - all Tribs	Storm runoff P loads will be estimated for all tributaries	
1.1.09.2.2.01.01	1430	Storage needs - all Tribs	Optimum storage requirements will be estimated for all tributaries	
1.1.09.2.2.01.01	1440	Bypass estimates - all Tribs	Estimates of bypass flows will be estimated for tributaries.	

1.1.09.2.2.01.01	1450	Data Model Development	Development of a data management tool that would enable tracking all P management activities (source control and regional treatment). It should be spatially based and should incorporate assimilative algorithms to account for P assimilation in the tributaries. This will provide a tool to integrate all interagency actions to insure that the actions are compatible.	
1.1.09.2.2.01.01	1460	Data Model scenario runs	Model scenarios to help identify optimum tributary basins in which to place reservoirs and/or STAs.	After the model is developed, it will be continuously updated with data from all other Okeechobee watershed projects throughout completion of both PIRs.
1.1.09.2.2.01.01	1470	PIR Work Plan	Based on the results of the Watershed Assessment, the required planning efforts will be defined in more detail.	The updated PIR work plan prepared by the Contractor will form the basis for an update to the PMP.
1.1.09.2.2.01.01	1480	Draft Assessment Report	The contractor will prepare a draft report that documents the results of the Watershed Assessment.	This report will be prepared so that it can be inserted directly as a section of the PIRs.
1.1.09.2.2.01.01	1485	PDT review - Draft Assess Rpt SFWMD	The PDT will review and comment on the draft Assessment Report.	
1.1.09.2.2.01.01	1490	PDT review - Draft Assess Rpt USACE		
1.1.09.2.2.01.01	1492	Public Workshop - Draft Assess Rpt USACE	A public workshop will be conducted to provide information on the results of the assessment and to solicit input.	The meeting will be facilitated by the Contractor with participation by the appropriate technical personnel from the USACE and SFWMD.
1.1.09.2.2.01.01	1493	Public Wkshop - Draft Assess Rpt SFWMD		
1.1.09.2.2.01.01	1495	Pub Wkshp - Draft Assess Rpt Contractor		

1.1.09.2.2.01.01	1500	Independent Tech Review - Assessment Rpt	After the assessment report has been modified to address PDT and public comments, an ITR will be conducted.	
1.1.09.2.2.01.01	1510	Final Assessment Report	The draft report will be finalized to reflect public, PDT, and ITR comments.	Prior to proceeding with subsequent planning steps for the PIRs, the PDT and DCT will concur with the report.
1.1.09.2.2.01.01	1700	Existing level of flood protection	Determine the existing level of flood protection at the basin-scale	This information will be used to evaluate flood control impacts of alternative plans.
1.1.09.2.1	1513	PMP Update - Assess Phase USACE	After the watershed assessment is complete and the water quality and storage problems have been identified on a basin-by-basin basis, it will be possible to provide more detail to the work products that will be required for the "other" projects PIR. This detail will be incorporated in the revision of the PMP.	
1.1.09.2.1	1516	PMP Update - Assess Phase SFWMD		
1.1.09.2.1	1520	PMP Update - Assess Phase Contract		
1.1.09.2.2.01.02	1271	Draft Performance Measure USACE	An initial set of performance measures (PMs) will be drafted. The PMs will be address all project purposes and all potential negative or beneficial impacts of the project. The PMs will include all evaluation criteria that will be used to identify the best alternative plan. PMs will include an explanation of why it is relevant to the evaluation process, a description of the goal or target, a method for how to evaluate alternative plans, and the format for quantifiable (if possible) scoring.	The USACE and SFWMD (and other PDT members) will provide substantial input to developing the performance measures. The contractor will serve as a facilitator to obtain the needed information and will also develop additional technical detail where necessary to support the PMs. The contractor will be responsible for documentation.
1.1.09.2.2.01.02	1272	Draft Performance Measures Contractor		
1.1.09.2.2.01.02	1273	Draft Performance Measures SFWMD		
1.1.09.2.2.01.02	1274	PDT Performance Measure Review SFWMD	The PDT will review the draft performance measures and provide comments.	

1.1.09.2.2.01.02	1275	PDT Performance Measure Review USACE		
1.1.09.2.2.01.02	1276	Perf Measure/Scoping Public Workshop	A public workshop will be conducted to provide information on the draft performance measures. This meeting will also be used for NEPA scoping.	The contractor will facilitate the meeting with technical participation by the USACE and SFWMD.
1.1.09.2.2.01.02	1277	Perf Measure/Scoping Public Mtg USACE		
1.1.09.2.2.01.02	1278	Perf Measure/Scoping Public Mtg SFWMD		
1.1.09.2.2.01.02	1279	Finalize Performance Measures	The draft Performance Measure Report will be modified based on comments by the PDT and the pubic.	The report will be prepared so that it can be directly inserted as a section of the Watershed Assessment.
1.1.09.2.2.02	1260	Future land use projections	A future land use projection will be developed to determine how land use in the future might change phosphorus loading to Lake Okeechobee if the CERP project is not constructed. This will be used to establish the "Future Without Project" conditions.	The projection will consider the Lake Okeechobee TMDL, potential future tributary TMDLs, potential future changes to the Works of the District Program, potential future changes to DEP's Dairy Rule, and any other exisitng and future local, state, or federal law, regulation, or policy that would impact land use.
1.1.09.2.2.03.01	1763	Initial Alternative Plans - TCNS USACE	A document will be prepared describing conceptual designs for an initial set of alternative plans. The plans will be identified based on best professional judgment regarding how well they might address the performance measures.	The contractor will facilitate the USACE and SFWMD technical staff (and other PDT members) to develop the initial list. The contractor will be responsible for documentation.
1.1.09.2.2.03.01	1767	Initial Alternative Plans - TCNS SFWMD		
1.1.09.2.2.03.01	1770	Initial Alternative Plans - TCNS Contractor		

1.1.09.2.2.03.01	1773	Pub Wkshp - Alt Plan Form - TCNS USACE	A public workshop will be conducted to provide information on the alternative plans and to obtain input.	The contractor will facilitate the meeting with technical participation by the USACE and SFWMD.
1.1.09.2.2.03.01	1775	Pub Wkshp - Alt Plan Form - TCNS Cont		
1.1.09.2.2.03.01	1777	Pub Wkshp - Alt Plan Form - TCNS SFWMD		
1.1.09.2.2.03.01	1772	Plan formulation - economics input - TCNS	An economist will participate in the development of alternative plans.	
1.1.09.2.2.03.01	1780	Final Alternative Plans - TCNS	The draft alternative plan document will be modified and finalized to reflect the PDT and public comments. The final alternative plan document will prioritize the alternatives based on best professional judgment of the contractor, PDT, and public input. It will narrow the alternative plans to those that merit detailed evaluation.	The contractor will be responsible for using input from the USACE and SFWMD (and other PDT members).
1.1.09.2.2.03.01	1790	Alternative Descriptions - TCNS	More detailed descriptions of the set of alternatives identified for more detailed evaluation will be prepared. The descriptions should be developed to a level of detail that will allow more detailed designs and cost estimates and hydrologic modeling.	
1.1.09.2.2.03.01	1795	PDT Alt Plan comments - TCNS SFWMD	The PDT will review and comment of the document that includes the initial set of alternatives, the descriptions of those alternatives selected for more detailed evaluation, and the rationale.	
1.1.09.2.2.03.01	1800	PDT Alt Plan Comments - TCNS USACE		

1.1.09.2.2.03.01	1810	Final Alternative Plan Document - TCNS	The Alternative Plan document will be finalized based on PDT and public input.	The contractor will be responsible for using input from the USACE and SFWMD (and other PDT members). It will be prepared in a form so that it can be directly inserted as a section in the PIR.
1.1.09.2.2.03.02	2037	Initial Alternative Plans - LO USACE	A document will be prepared describing conceptual designs for an initial set of alternative plans. The plans will be identified based on best professional judgment regarding how well they might address the performance measures.	The contractor will facilitate the USACE and SFWMD technical staff (and other PDT members) to develop the initial list. The contractor will be responsible for documentation.
1.1.09.2.2.03.02	2038	Initial Alternative Plans - LO SFWMD		
1.1.09.2.2.03.02	2040	Initial Alternative Plans - LO Contractor		
1.1.09.2.2.03.02	2039	Plan formulation - economics input - LO	Economics input to the development of alternative plans.	
1.1.09.2.2.03.02	2043	Public Workshop - Alt Plans - LO USACE	A public workshop will be conducted to provide information on the alternative plans and to obtain input.	The contractor will facilitate the meeting with technical participation by the USACE and SFWMD.
1.1.09.2.2.03.02	2046	Public Workshop - Alt Plans - LO SFWMD		
1.1.09.2.2.03.02	2050	Public Workshop - Alt Plans - LO Contractor		
1.1.09.2.2.03.02	2060	Final Alt Plans - LO	The draft alternative plan document will be modified and finalized to reflect the PDT and public comments. The final alternative plan document will prioritize the alternatives based on best professional judgment of the contractor, PDT, and public input. It will narrow the alternative plans to those that merit detailed evaluation.	The contractor will be responsible for using input from the USACE and SFWMD (and other PDT members).

1.1.09.2.2.03.02	2070	Alt Plan Descriptions - LO	More detailed descriptions of the set of alternatives identified for more detailed evaluation will be prepared. The descriptions should be developed to a level of detail that will allow more detailed designs and cost estimates and hydrologic modeling.	
1.1.09.2.2.03.02	2075	PDT Review Alt Plans - LO SFWMD	The PDT will review and comment of the document that includes the initial set of alternatives, the descriptions of those alternatives selected for more detailed evaluation, and the rationale.	
1.1.09.2.2.03.02	2080	PDT Review Alt Plans - LO USACE		
1.1.09.2.2.03.02	2090	Final Alt Plan Document - LO	The Alternative Plan document will be finalized based on PDT and public input.	The contractor will be responsible for using input from the USACE and SFWMD (and other PDT members). It be prepared in a form so that it can be directly inserted as a section in the PIR.
1.1.09.2.2.04.01	1761	Topo Data Collection - TCNS	Topo data will be collected where necessary to supplement existing data. The data will be used to prepare general engineering design for alternative plans.	
1.1.09.2.2.04.01	1762	Geotech Data Collection - TCNS	Geotechnical data will be collected where necessary to supplement existing data. The data will be used to generally design alternative plans.	This work includes field investigations, lab analyses, and hydrogeologic and geotechnical analyses.
1.1.09.2.2.04.01	1820	Alt Plan Conceptual Design - TCNS	A conceptual engineering design for the final alternative plans will be developed. It will be to a sufficient level of detail that will allow for initial cost estimates that will enable valid comparisons of alternatives.	

1.1.09.2.2.04.01	1830	Alt Plan Cost Estimates - TCNS	Cost estimates will be prepared for the alternative plans.	The cost estimates will be prepared to a level of detail that will allow valid comparison of alternatives.
1.1.09.2.2.04.01	1840	H&H Evaluation of Alternative Plans - TCNS	Hydrologic modeling will be conducted as necessary to allow evaluation of the alternatives.	The modeling needs will be defined during the development of the performance measures.
1.1.09.2.2.04.01	1850	Socio-Economic Evaluation Alt Plans - TCNS	An economic evaluation will address all economic evaluation criteria defined in the performance measures. This will include (but not be limited to) flood control impacts, recreation impacts, water supply, cost efficiency, direct and indirect regional economic impacts. This evaluation will also address sociologic impacts, including environmental justice.	
1.1.09.2.2.04.01	1860	Real Estate Cost Est Alt Plans - TCNS	Real estate costs will be developed for each alternative plan to a level of detail that will allow valid comparisons of the alternatives.	Cost estimates will be based on local per acre cost estimates. This will not include appraisals of specific parcels.
1.1.09.2.2.04.01	1870	Environmental Evaluation Alt Plans - TCNS	Evaluations will be performed for each environmental performance measure according to the prescribed methodologies.	
1.1.09.2.2.04.01	1880	Draft Alt Plan Evaluation Document - TCNS	The results of all alternative plan evaluations will be summarized in a document. This will include an evaluation of each alternative against each of the performance measures.	All evaluations will be performed and documented following the procedures and format specified in the performance measures.
1.1.09.2.2.04.01	1885	PDT Cmts Draft Alt Eval Doc - TCNS SFWMD	The PDT will review and comment on the draft alternative evaluation document.	
1.1.09.2.2.04.01	1890	PDT Cmts - Draft Alt Eval Doc - TCNS USACE		
1.1.09.2.2.04.01	1900	Independent Tech Review - Evaluation Doc - TCNS	An ITR will be conducted to evaluate the application of the evaluations.	

1.1.09.2.2.04.01	1910	Final Evaluation Document - TCNS	The final evaluation report will incorporate all PDT and ITR comments.	The report will be prepared so that it can be directly inserted as a section of the PIR.
1.1.09.2.2.04.01	1955	USFWS participation in the TCNS PIR process - TCNS	One biologist will participate full time for a 5-year period to provide all required USFWS input to the PIR.	This includes all funds and resources required by USFWS to provide all required deliverables - including CAR and ESA consultation.
1.1.09.2.2.04.01	1956	Endangered Species Consultation - TCNS	Fish & Wildlife Service Endangered Species Consultation	All costs and resources for consultation are included in the overall participation of one FTE for 5 years. These costs are captured in activity # 1955
1.1.09.2.2.04.01	1957	Fish & Wildlife Coord Act Rpt - TCNS	The Fish & Wildlife Coordination Act Report for TCNS would be included in the PIR/EIS	All costs and resources for preparation of the report are included in the overall participation of one FTE for 5 years. These costs are captured in activity # 1955
1.1.09.2.2.04.01	1958	Draft water control plan - TCNS	A draft water control plan will be included in the PIR/EIS	The final water control manual will be prepared during the design process.
1.1.09.2.2.04.02	2233	Endangered Species Consultation - LO	Endangered Species Consultation for the LO PIR	All costs and resources for this deliverable are included in activity # 2235 which consists of 3 USFWS FTEs for a 4 year period.
1.1.09.2.2.04.02	2234	Fish & Wildlife Coord Act Rpt - LO	The Fish & Wildlife Coordination Act Report for LO would be included in the PIR/EIS	All costs and resources for this deliverable are included in activity # 2235 which consists of 3 USFWS FTEs for a 4 year period.

1.1.09.2.2.04.02	2235	LO Fish & Wildlife Coordination PIR process	The USFWS will provide 3 biologist FTEs for 4 years to provide input to the PIR/EIS	This includes all funds and resources required by USFWS to provide all required deliverables - including CAR and ESA consultation.
1.1.09.2.2.04.02	2237	Draft water control plan - LO	A preliminary water control plan will be included in the PIR	The water control manual will be prepared during the design process.
1.1.09.2.2.04.02	2041	Topo Data collection - LO	Topo data will be collected where necessary to supplement existing data. The data will be used to prepare general engineering design for alternative plans.	
1.1.09.2.2.04.02	2042	Geotech Data collection - LO	Geotechnical data will be collected where necessary to supplement existing data. The data will be used to generally design alternative plans.	This work includes field investigations, lab analyses, and hydrogeologic and geotechnical analyses.
1.1.09.2.2.04.02	2100	Alt Plan Conceptual Design - LO	A conceptual engineering design for the final alternative plans will be developed. It will be to a sufficient level of detail that will allow for initial cost estimates that will enable valid comparisons of alternatives.	
1.1.09.2.2.04.02	2110	Alt Plans Cost Estimates - LO	Cost estimates will be prepared for the alternative plans.	The cost estimates will be prepared to a level of detail that will allow valid comparison of alternatives.
1.1.09.2.2.04.02	2120	H&H Evaluation of Alt Plans - LO	Hydrologic modeling will be conducted as necessary to allow evaluation of the alternatives.	The modeling needs will be defined during the development of the performance measures.

1.1.09.2.2.04.02	2130	Socio-Economic Evaluation Alt Plans - LO	An economic evaluation will address all economic evaluation criteria defined in the performance measures. This will include (but not be limited to) flood control impacts, recreation impacts, water supply, cost efficiency, direct and indirect regional economic impacts. This evaluation will also address sociologic impacts, including environmental justice.	
1.1.09.2.2.04.02	2140	Real Estate Cost Alt Plans - LO	Real estate costs will be developed for each alternative plan to a level of detail that will allow valid comparisons of the alternatives.	Cost estimates will be based on local per acre cost estimates. This will not include appraisals of specific parcels.
1.1.09.2.2.04.02	2150	Environmental Evaluation Alt Plans - LO	Evaluations will be performed for each environmental performance measure according to the prescribed methodologies.	
1.1.09.2.2.04.02	2160	Draft Alt Plan Evaluation Document - LO	The results of all alternative plan evaluations will be summarized in a document. This will include an evaluation of each alternative against each of the performance measures.	All evaluations will be performed and documented following the procedures and format specified in the performance measures.
1.1.09.2.2.04.02	2165	PDT Cmts - Alt Plan Evaluation - LO SFWMD	The PDT will review and comment on the draft alternative evaluation document.	
1.1.09.2.2.04.02	2170	PDT Cmts - Alt Plan Evaluation - LO USACE		
1.1.09.2.2.04.02	2180	ITR Alt Plan Evaluation - LO	An ITR will be conducted to evaluate the application of the evaluations.	
1.1.09.2.2.04.02	2190	Final Alt Plan Evaluation Report - LO	The final evaluation report will incorporate all PDT and ITR comments.	The report will be prepared so that it can be directly inserted as a section of the PIR.
1.1.09.2.2.05.01	1522	RECOVER - TCNS PIR participation	A RECOVER team member will participate throughout the TCNS PIR process	

1.1.09.2.2.05.01	1960	Draft PIR/EIS - TCNS	The Watershed Assessment, Alternative Plan Report, and the Alternative Evaluation Report will be merged to create the draft PIR/EIS. The draft PIR/EIS will not include a recommended plan.	The report will be prepared in a format consistent with the requirements of NEPA. The recommended plan will be identified during the public review period.
1.1.09.2.2.05.01	1961	RECOVER review draft PIR/EIS - TCNS	The RECOVER Team will review the alternative plans and provide input regarding consistency with CERP goals and objectives	
1.1.09.2.2.05.01	1963	PDT Review Draft PIR/EIS - TCNS USACE	The PDT will review and comment on the draft PIR/EIS	
1.1.09.2.2.05.01	1966	PDT Review Draft PIR/EIS - TCNS SFWMD		
1.1.09.2.2.05.01	1970	Public Review DEIS - TCNS	The draft PIR/EIS will be publicly noticed and sent out for a 90-day public review period.	
1.1.09.2.2.05.01	1975	PDT Comparison Alt Plans - TCNS SFWMD	The PDT will use the alternative plan evaluation report to compare the alternative plans. This will include applying weights to each of the performance measures, evaluating uncertainties, performing tradeoff analyses.	The contractor will facilitate a PDT meeting for this purpose. Each PDT member will provide technical assessments and will provide input regarding agency policies.
1.1.09.2.2.05.01	1980	PDT Comparison Alt Plans - TCNS USACE		
1.1.09.2.2.05.01	1990	Pub Wkshp - Draft EIS/PIR TCNS Contractor	A public workshop will be conducted to provide information on the project and to obtain input regarding the recommended plan.	The workshop will be conducted after the distribution of the draft PIR/EIS and prior to the end of the review period.
1.1.09.2.2.05.01	1993	Pub Wkshp - Draft EIS/PIR TCNS USACE		
1.1.09.2.2.05.01	1996	Pub Wkshp - Draft EIS/PIR TCNS SFWMD		
1.1.09.2.2.05.01	2000	Final Draft PIR/EIS TCNS Contractor	The draft PIR/EIS will be finalized based on public comments. A recommended plan will be identified.	Each comment will be specifically addressed in accordance with the requirements of NEPA. The contractor will be responsible for
1.1.09.2.2.05.01	2003	Final Draft PIR/EIS TCNS USACE		

1.1.09.2.2.05.01	2006	Final Draft PIR/EIS TCNS SFWMD		documentation. The contractor will coordinate closely with the USACE and SFWMD in preparation of responses to comments.
1.1.09.2.2.05.01	2010	Public Review - Final PIR/EIS - TCNS	The final draft PIR/EIS will be publicly noticed and sent out for a 60-day review period.	
1.1.09.2.2.05.01	2013	Pub Wkshp - Final PIR/EIS - TCNS USACE	A public workshop will be conducted to present the final draft PIR/EIS.	
1.1.09.2.2.05.01	2016	Pub Wkshp - Final PIR/EIS - TCNS SFWMD		
1.1.09.2.2.05.01	2020	Pub Wkshp - Final PIR/EIS - TCNS Contractor		
1.1.09.2.2.05.01	2023	ROD - TCNS USACE	The USACE and SFWMD will cooperate in coordination and responding to questions during the process of finalizing a Record of Decision.	
1.1.09.2.2.05.01	2030	ROD - TCNS SFWMD		
1.1.09.2.2.05.01	2035	Congressional Committee Approval PIR - TCNS	The PIR/EIS will be submitted to Congressional authorizing committees for approval.	
1.1.09.2.2.05.02	2236	RECOVER - LO PIR participation	A RECOVER team member will participate throughout the LO PIR process	
1.1.09.2.2.05.02	2240	Draft PIR/EIS - LO	The Watershed Assessment, Alternative Plan Report, and the Alternative Evaluation Report will be merged to create the draft PIR/EIS. The draft PIR/EIS will not include a recommended plan.	The report will be prepared in a format consistent with the requirements of NEPA. The recommended plan will be identified during the public review period.

1.1.09.2.2.05.02	2241	RECOVER review draft PIR/EIS - LO	The RECOVER Team will review the alternative plans and provide input regarding consistency with CERP goals and objectives	
1.1.09.2.2.05.02	2243	PDT Review Draft PIR/EIS - LO USACE	The PDT will review and comment on the draft PIR/EIS	
1.1.09.2.2.05.02	2246	PDT Review Draft PIR/EIS - LO SFWMD		
1.1.09.2.2.05.02	2250	Public Review Draft PIR/EIS - LO	The draft PIR/EIS will be publicly noticed and sent out for a 90-day public review period.	
1.1.09.2.2.05.02	2253	Public Wkshp - Draft PIR/EIS - LO USACE	A public workshop will be conducted to provide information on the project and to obtain input regarding the recommended plan.	The workshop will be conducted after the distribution of the draft PIR/EIS and prior to the end of the review period.
1.1.09.2.2.05.02	2256	Public Wkshp - Draft PIR/EIS - LO SFWMD		
1.1.09.2.2.05.02	2270	Public Wkshp - Draft PIR/EIS - LO Contractor		
1.1.09.2.2.05.02	2273	Final Draft PIR/EIS - LO USACE	The draft PIR/EIS will be finalized based on public comments. A recommended plan will be identified.	Each comment will be specifically addressed in accordance with the requirements of NEPA. The contractor will be responsible for documentation. The contractor will coordinate closely with the USACE and SFWMD in preparation of responses to comments.
1.1.09.2.2.05.02	2276	Final Draft PIR/EIS - LO SFWMD		
1.1.09.2.2.05.02	2280	Final Draft PIR/EIS - LO Contractor		
1.1.09.2.2.05.02	2290	Public Review Final PIR/EIS	The final draft PIR/EIS will be publicly noticed and sent out for a 60-day review period.	
1.1.09.2.2.05.02	2300	Public Workshop - Final PIR/EIS - LO Contractor	A public workshop will be conducted to present the final draft PIR/EIS.	
1.1.09.2.2.05.02	2301	Public Workshop - Final PIR/EIS - LO SFWMD		

1.1.09.2.2.05.02	2302	Public Workshop - Final PIR/EIS - LO USACE		
1.1.09.2.2.05.02	2303	ROD - LO SFWMD	The USACE and SFWMD will cooperate in coordination and responding to questions during the process of finalizing a Record of Decision.	
1.1.09.2.2.05.02	2310	ROD - LO USACE		
1.1.09.2.2.05.02	2340	Congressional Authorization - LO	The PIR/EIS will be submitted to Congressional authorizing committees for approval.	
1.1.09.2.3.01	1920	Environmental Eval Appendix - TCNS	An environmental evaluation appendix will document all environmental evaluations performed.	Methods, assumptions, data, etc used to develop the results presented in the environmental evaluation will be documented.
1.1.09.2.3.02	2200	Environmental Evaluation App - LO	An environmental evaluation appendix will document all environmental evaluations performed.	Methods, assumptions, data, etc used to develop the results presented in the environmental evaluation will be documented.
1.1.09.2.4.01	1940	Socio-Economic Appendix - TCNS	A Socio-Economic evaluation appendix will document all socio-economic evaluations performed.	Methods, assumptions, data, etc used to develop the results presented in the socio-economic evaluation will be documented.
1.1.09.2.4.02	2220	Socio-Economic Evaluation Appendix - LO	A Socio-Economic evaluation appendix will document all socio-economic evaluations performed.	Methods, assumptions, data, etc used to develop the results presented in the socio-economic evaluation will be documented.
1.1.09.2.5.01	1930	Eng & Design Appendix - TCNS	An appendix will be prepared to document all engineering and design work performed for the PIR.	Methods, assumptions, models, data, etc used to develop the engineering information presented in the PIR will be documented.
1.1.09.2.5.02	2210	Eng & Design Appendix - LO	An appendix will be prepared to document all engineering and design work performed for the PIR.	Methods, assumptions, models, data, etc used to develop the engineering information presented in the PIR will be documented.

1.1.09.2.6.01	1950	Real Estate Appendix - TCNS	An appendix will be prepared to document all real estate results presented in the PIR. The appendix will include a Gross Appraisal and a Real Estate Plan as required in the MPMP.	Methods, assumptions, models, data, etc used to develop the real estate information presented in the PIR will be documented.
1.1.09.2.6.02	2230	Real Estate Evaluation Appendix - LO	An appendix will be prepared to document all real estate results presented in the PIR. The appendix will include a Gross Appraisal and a Real Estate Plan as required in the MPMP.	Methods, assumptions, models, data, etc used to develop the real estate information presented in the PIR will be documented.
1.1.09.4	2320	DDR - TCNS	Detailed engineering design will be presented in a report. The level of detail will be sufficient to allow preparation of construction plans and specifications.	Details of the work required for the DDR will be presented in the PIR Update of the PMP.
1.1.09.4	2330	DDR - LO	Detailed engineering design will be presented in a report. The level of detail will be sufficient to allow preparation of construction plans and specifications.	Details of the work required for the DDR will be presented in the PIR Update of the PMP.
1.1.09.5	2370	Plans & Specs - TCNS	Plans and specification for a construction contract will be prepared, along with a Government cost estimate.	
1.1.09.5	2380	Plans & Specs - LO	Plans and specification for a construction contract will be prepared, along with a Government cost estimate.	
1.1.09.7	2350	Real Estate Acquisition - TCNS	Real estate acquisition will include all title work, appraisals, negotiations, surveys, environmental assessments, and acquisition to obtain the appropriate real estate interest in the property.	Evaluation of real estate issues for all alternative plans, identification of the required real estate for the recommended plan, and development of preliminary cost estimates will be performed as part of the PIR development.

1.1.09.7	2360	Real Estate Acquisition - LO	Real estate acquisition will include all title work, appraisals, negotiations, surveys, environmental assessments, and acquisition to obtain the appropriate real estate interest in the property.	Selection of the required real estate and development of preliminary cost estimates will be performed as part of the PIR development.
1.1.09.8	2410	Construction - TCNS	This consists of all activities associated with construction of the recommended plan.	
1.1.09.8	2420	Construction - LO	This consists of all activities associated with construction of the recommended plan.	
1.1.09.B.1.1	1528	Define monitoring objectives SFWMD	The overall objectives of a basin-scale monitoring system primarily for phosphorus load, flow, and sedimentation data collection.	The system will be supplemented by project monitoring that will be defined for each CERP project during the PIR process.
1.1.09.B.1.1	1529	Define monitoring objectives USGS		
1.1.09.B.1.1	1530	Define monitoring objectives USACE		
1.1.09.B.1.1	1532	Monitoring Design/Imp Coordination SFWMD	Coordination and project management required to integrate the current SFWMD monitoring protocols and data management with this project.	
1.1.09.B.1.1	1534	Monitoring Design/Imp Coordination USACE	Coordination and project management required to insure that the USACE requirements are met.	
1.1.09.B.1.2	1540	Identify potential monitoring sites	Based on an inventory of existing data, review of existing literature and maps, and site reconnaissance, select potential locations for flow, sediment, and water quality monitoring.	This task will include the establishment of criteria or standards to be used to determine the suitability of existing data or monitoring sites for this project.

1.1.09.B.1.3	1550	Site & parameter selection	Based on the results of the feasibility evaluation, make site selections for flow, sediment, meteorology, and water-quality monitoring. These sites should be co-located (weather sites may be at different locations depending on needs). Preferable to collect suspended sediment concentration data (analysis of full sample) instead of total suspended solids (analysis of an aliquot of the sample). Automatic samplers also should be considered for selected sites.	
1.1.09.B.1.4	1560	Monitoring site design	Produce a site sketch and research/specify equipment for each site. Based on the characteristics and data needs at each site, produce a list of equipment and materials required for installation.	
1.1.09.B.1.5	1570	Cost estimate for network	Based on present-day costs and a reasonable estimate for inflation, provide cost estimates on an annual basis for the following: purchase and installation of all equipment; labor and travel costs for installation; analytical costs for water quality, sediment, and biological work; operation and maintenance costs for all sites; additional costs for quality assurance for all aspects; database management; publication of data.	
1.1.09.B.1.6	1531	RECOVER Monitoring design participation	A RECOVER team member will participate throughout the monitoring system design process	

1.1.09.B.1.6	1572	RECOVER Monitoring Plan review	The RECOVER Team will review the proposed monitoring plan to insure consistency with CERP monitoring protocols.	
1.1.09.B.1.6	1573	Monitoring Network Design Approval - USACE	The Corp and SFWMD will review the monitoring system design and cost estimate to insure that it meets technical needs and budgetary constraints.	
1.1.09.B.1.6	1574	Monitoring Network Design Approval - SFWMD		
1.1.09.B.2.01	1575	Obtain Real Estate for Gages SFWMD	Identify if there is a private interest in the site that has been selected. Determine whether or not special permission is required and initiate whatever paperwork is needed. If necessary, real estate interests will be acquired.	The USGS will lead this effort. The SFWMD will provide technical assistance with site-specific real estate issues and will facilitate the process. The USACE will review and approve any necessary acquisitions.
1.1.09.B.2.01	1577	Obtain Real Estate for Gages USACE		
1.1.09.B.2.01	1580	Obtain real estate USGS		
1.1.09.B.2.02	1590	Purchase equipment	Based on the list of equipment needs, compare cost of purchase vs. rent, and if rental is feasible. Produce the documents required for the bid process if needed, or if not needed, place orders for all equipment.	
1.1.09.B.2.03	1600	Purchase supplies & materials	Purchase of lumber, aluminum, 2-inch pipe, hydraulic pounder, shelters large enough to accommodate automatic samplers.	
1.1.09.B.2.04	1610	Construction of monitoring sites	Build walkways, install shelters, install electronics, lightning protection, and meteorological equipment.	
1.1.09.B.2.05	1620	Post-construction tasks	Survey from regional control points (benchmarks or reference marks) to monitoring sites, and determine from GPS the latitude and longitude of each site. Initialize each site in the database.	

1.1.09.B.3.01	1630	Monitoring network operations/schedule	Determine appropriate site visit time interval (flow and ET stations) and sampling frequency for the various aspects of the project (water quality, biological, sediment).	
1.1.09.B.3.03	1640	Operations Plans & Quality Assurance	Prepare documents that define or outline the plan for operating data collection sites, including the ET sites. Prepare the documents that define the procedures to be used to collect periodic data (water quality sampling, biological and sediment sampling for both routine and event-based sampling). Prepare the documents that define the quality-assurance procedures to be applied for continuous data collection and periodic sampling.	
1.1.09.B.3.04	1650	Monitoring site maintenance & repair	Maintain structures and equipment at all sites. Repairs may include but not be limited to replacement of parts or structural components.	
1.1.09.B.3.05	1660	Discharge measurements/WQ maintenance	On a bi-monthly basis, visit all stations, retrieve data from electronic dataloggers (EDLs), check on equipment, and make discharge measurements for rating the flow at the station. Calibrate and clean in-situ sensors, replace D.O. membranes or other parts as needed. Maintain good written records for use in the storage of the data (subsequent step).	
1.1.09.B.3.05	1670	Auto-sampler servicing	Labor costs for travel to auto-samplers and cost of labor required to composite discrete samples, process samples, and ship samples to the laboratory.	

1.1.09.B.3.05	1680	Water Quality Sampling	Labor and analysis costs associated with stream water-quality sampling.	
1.1.09.B.3.05	1690	Sediment sampling	Labor and analysis cost for bottom sediment sampling	
1.1.09.B.3.05	1710	Data collection ET	Visit each ET site monthly and service all equipment. Retrieve all data from datalogger. Replace equipment that routinely requires it (globes on net radiometers).	
1.1.09.B.3.06.04	1730	Processing continuous WQ data	Process data into database from field computer. Follow standard procedures and quality-assurance practices for storage of continuous water quality data.	
1.1.09.B.3.06.05	1740	Shipment of samples to laboratory	Shipping samples and reviewing laboratory results	
1.1.09.B.3.06.05	1750	Review lab results	Reviewing laboratory results for errors in analysis and to insure that results were received for all samples sent to the laboratory for analysis. Reviewing manual entry of field measurements for transcription errors.	
1.1.09.B.3.06.06	1760	Provide data	General support for retrieval of data, provision of data through a network or through the Internet, and coordination/facilitation of requests.	
1.1.09.B.3.06.07	1755	Data Interpretation and reporting	Data will be compiled and reported on an annual basis in a format that will assist in management decisions.	This will be performed by SFWMD. The information will be used to guide CERP planning and design as well as identify where additional source control measures are required.

1.1.09.B.3.0601	1720	Data processing - stream flow	Process data into database from field computer. Follow standard procedures and quality assurance practices for calculation of streamflow data. Methods will vary depending on the station and equipment in place (stage-discharge or index-velocity ratings).	

Project: Lake Okeechobee Watershed Project – Component 1
Cost Estimates for E-HTRW ASSESSMENT

Taylor Creek/ Nubbin Slough (TCNS) Storage Treatment Area

TASK	LEAD OFFICE	SCHED. START	SCHED. FINISH	TOTAL COST
Archive Research &				
Site Reconnaissance (1)	PD-EE	TBN	TBN	$30,000
Site Characterization (2)	EN-GE	TBN	TBN	$50,000
Qualitative Risk Anal. (3)	EN-GE	TBN	TBN	$50,000
Response Alternative				
Analysis (4)	EN-GE	TBN	TBN	$50,000
Cost Estimates (5)	EN-GE	TBN	TBN	$37,500
Sponsor Coordination (6)	PD-PR	TBN	TBN	$12,500
E-HTRW Appendix(7)	EN-GE	TBN	TBN	$10,000
TOTAL				$240,000

Footnotes:

(1) Assumes 1 person for 12 weeks @ $2500 per week
(2) Assumes 5 E-HTRW sites, study and analysis only, no field sampling, @ $10,000 per site
(3) Assumes 5 E-HTRW sites, assumes site visit costs for 1 or 2 persons @ $10,000 per site
(4) Assumes 5 E-HTRW sites with minimal field sampling costs @ $10,000 per site
(5) Assumes 5 E-HTRW sites and cost estimates for RD ($2500), RA ($2500), O&M ($2500) at each site
(6) Assumes 1 person for 5 weeks @ $2500 per week
(7) Assumes 1 person for 4 weeks @ $2500 per week

Project: Lake Okeechobee Watershed Project – Component 2

Cost Estimates for E-HTRW ASSESSMENT

North of Lake Okeechobee (NOLO) Storage Reservoir

TASK	LEAD OFFICE	SCHED. START	SCHED. FINISH	TOTAL COST
Archive Research &				
Site Reconnaissance (1)	PD-EE	TBN	TBN	$30,000
Site Characterization (2)	EN-GE	TBN	TBN	$50,000
Qualitative Risk Anal. (3)	EN-GE	TBN	TBN	$50,000
Response Alternative				
Analysis (4)	EN-GE	TBN	TBN	$50,000
Cost Estimates (5)	EN-GE	TBN	TBN	$37,500
Sponsor Coordination (6)	PD-PR	TBN	TBN	$12,500
E-HTRW Appendix(7)	EN-GE	TBN	TBN	$10,000
TOTAL				$240,000

Footnotes:

(1) Assumes 1 person for 12 weeks @ $2500 per week
(2) Assumes 5 E-HTRW sites, study and analysis only, no field sampling, @ $10,000 per site
(3) Assumes 5 E-HTRW sites, assumes site visit costs for 1 or 2 persons @ $10,000 per site
(4) Assumes 5 E-HTRW sites with minimal field sampling costs @ $10,000 per site
(5) Assumes 5 E-HTRW sites and cost estimates for RD ($2500), RA ($2500), O&M ($2500) at each site
(6) Assumes 1 person for 5 weeks @ $2500 per week
(7) Assumes 1 person for 4 weeks @ $2500 per week

Project: Lake Okeechobee Watershed Project – Component 3
Cost Estimates for E-HTRW ASSESSMENT

Lake Okeechobee Watershed Water Quality (LOWWQ) Treatment Facilities

TASK	LEAD OFFICE	SCHED. START	SCHED. FINISH	TOTAL COST
Archive Research &				
Site Reconnaissance (1)	PD-EE	TBN	TBN	$30,000
Site Characterization (2)	EN-GE	TBN	TBN	$50,000
Qualitative Risk Anal. (3)	EN-GE	TBN	TBN	$50,000
Response Alternative				
Analysis (4)	EN-GE	TBN	TBN	$50,000
Cost Estimates (5)	EN-GE	TBN	TBN	$37,500
Sponsor Coordination (6)	PD-PR	TBN	TBN	$12,500
E-HTRW Appendix(7)	EN-GE	TBN	TBN	$10,000
TOTAL				$240,000

Footnotes:

(1) Assumes 1 person for 12 weeks @ $2500 per week
(2) Assumes 5 E-HTRW sites, study and analysis only, no field sampling, @ $10,000 per site
(3) Assumes 5 E-HTRW sites, assumes site visit costs for 1 or 2 persons @ $10,000 per site
(4) Assumes 5 E-HTRW sites with minimal field sampling costs @ $10,000 per site
(5) Assumes 5 E-HTRW sites and cost estimates for RD ($2500), RA ($2500), O&M ($2500) at each site
(6) Assumes 1 person for 5 weeks @ $2500 per week
(7) Assumes 1 person for 4 weeks @ $2500 per week

Project: Lake Okeechobee Watershed Project – Component 4
Cost Estimates for E-HTRW ASSESSMENT

Lake Okeechobee Tributary (LOT) Sediment Dredging

TASK	LEAD OFFICE	SCHED. START	SCHED. FINISH	TOTAL COST
Archive Research &				
Site Reconnaissance (1)	PD-EE	TBN	TBN	$30,000
Site Characterization (2)	EN-GE	TBN	TBN	$50,000
Qualitative Risk Anal. (3)	EN-GE	TBN	TBN	$50,000
Response Alternative				
Analysis (4)	EN-GE	TBN	TBN	$50,000
Cost Estimates (5)	EN-GE	TBN	TBN	$37,500
Sponsor Coordination (6)	PD-PR	TBN	TBN	$12,500
E-HTRW Appendix(7)	EN-GE	TBN	TBN	$10,000
TOTAL				$240,000

Footnotes:

1) Assumes 1 person for 12 weeks @ $2500 per week
2) Assumes 5 E-HTRW sites, study and analysis only, no field sampling, @ $10,000 per site
3) Assumes 5 E-HTRW sites, assumes site visit costs for 1 or 2 persons @ $10,000 per site
4) Assumes 5 E-HTRW sites with minimal field sampling costs @ $10,000 per site
5) Assumes 5 E-HTRW sites and cost estimates for RD ($2500), RA ($2500), O&M ($2500) at each site
6) Assumes 1 person for 5 weeks @ $2500 per week
7) Assumes 1 person for 4 weeks @ $2500 per week

TAB B of Appendix C – Listing of Project Goals and Objectives

See Paragraph 3.2

TAB C of Appendix C– Listing of Project Constraints and Assumptions

See Paragraph 3.3

Appendix D: Project Schedule

TAB A of Appendix D– Logic Network

Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1040	PMP Project Management	1d	03/08/01	03/08/01	
01-1050	Project Information	1d	03/08/01	03/08/01	
01-1060	Project Scope	1d	03/08/01	03/08/01	
01-1070	Work Breakdown Structure	1d	03/08/01	03/08/01	
01-1080	Organization Breakdown Structure	1d	03/08/01	03/08/01	
01-1090	Change Control Procedures	1d	03/08/01	03/08/01	
01-1100	Project Schedule Development	1d	03/09/01	03/09/01	01-1050, 01-1060, 01-1070, 01-1080
01-1110	Project Cost Estimate	1d	03/12/01	03/12/01	01-1100
01-1120	Funding Requirements	1d	03/13/01	03/13/01	01-1110
01-1130	Functional Area Plans	1d	03/12/01	03/12/01	01-1100
01-1150	Draft PMP	1d	03/14/01	03/14/01	01-1090, 01-1120, 01-1130
01-1160	Corps Approval PMP	84d	03/15/01	07/12/01	01-1150
01-1170	SFWMD Approval PMP	84d	03/15/01	07/12/01	01-1150
01-1173	Planning Tech Lead - Watershed Assess	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1175	Proj Mgt - Watershed Assess - Corps	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1177	Proj Mgt - Watershed Assess - SFWMD	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1178	RECOVER - Watershed Assess - PDT participat...	450d	07/13/01	05/01/03	01-1160, 01-1170
01-1180	Scope of Work AE Contract - Corps	22d	07/13/01	08/14/01	01-1040, 01-1160, 01-1170
01-1182	Scope of Work AE Contract - SFWMD	22d	07/13/01	08/13/01	01-1040, 01-1160, 01-1170
01-1190	Gov't Estimate SFWMD	10d	08/14/01	08/28/01	01-1180, 01-1182
01-1192	Review Gov't Est Corps	10d	08/14/01	08/28/01	01-1180, 01-1182
01-1200	Procurement AE contract	66d	08/28/01	12/05/01	01-1190, 01-1192
01-1208	Water Quality Design Criteria Contract	66d	12/05/01	03/13/02	01-1200
01-1210	Water Quality Design Criteria SFWMD	66d	12/05/01	03/13/02	01-1200
01-1218	Water Quality Design Criteria - Corps	66d	12/05/01	03/13/02	01-1200
01-1220	Land use & soil data	22d	12/05/01	01/08/02	01-1200
01-1230	Describe WQ & flow monitoring system	22d	12/05/01	01/08/02	01-1200
01-1240	Lit review - sedimentation/other info	22d	12/05/01	01/08/02	01-1200
01-1250	Rainfall frequency analysis	22d	12/05/01	01/08/02	01-1200
01-1260	Future land use projections	44d	12/05/01	02/08/02	01-1200

TASK filter: All Activities

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1270	P Settling Rate	22d	12/05/01	01/08/02	01-1200
01-1271	Draft Performance Measure Corps	44d	12/05/01	02/08/02	01-1200
01-1272	Draft Performance Measures Contractor	44d	12/05/01	02/08/02	01-1200
01-1273	Draft Performance Measures SFWMD	44d	12/05/01	02/08/02	01-1200
01-1274	PDT Performance Measure Review SFWMD	40d	02/08/02	04/08/02	01-1271, 01-1272, 01-1273
01-1275	PDT Performance Measure Review Corps	44d	02/08/02	04/12/02	01-1271, 01-1272, 01-1273
01-1276	Perf Measure/Scoping Public Workshop	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1277	Perf Measure/Scoping Public Mtg Corps	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22d	04/12/02	05/14/02	01-1274, 01-1275
01-1279	Finalize Performance Measures	44d	05/14/02	07/17/02	01-1276, 01-1277, 01-1278, 01-1281
01-1280	Tributary basin boundary delineation	90d	12/05/01	04/16/02	01-1200
01-1281	In Progress Review - Scoping	22d	05/14/02	06/14/02	01-1276, 01-1277, 01-1278
01-1290	Identify Pilot Tributaries	10d	01/08/02	01/23/02	01-1220, 01-1230, 01-1240
01-1300	Determine base flow @ structures	10d	01/23/02	02/06/02	01-1290
01-1302	Select analytical method SFWMD	10d	02/06/02	02/21/02	01-1300
01-1305	Select analytical method Corps	10d	02/06/02	02/21/02	01-1300
01-1310	Select analytical method Contractor	10d	02/06/02	02/21/02	01-1300
01-1320	Base flow estimate - pilot tribs	10d	02/21/02	03/07/02	01-1260, 01-1302, 01-1305, 01-1310
01-1330	Storm runoff computations - pilot tribs	10d	02/21/02	03/07/02	01-1250, 01-1260, 01-1302, 01-1305, 01-1310
01-1340	P load estimates - base flow - pilot tribs	10d	03/07/02	03/21/02	01-1320
01-1350	P load estimates - storm flow - pilot tribs	10d	03/07/02	03/21/02	01-1330
01-1360	Bypass flow estimates - pilot tribs	10d	03/21/02	04/04/02	01-1208, 01-1210, 01-1218, 01-1270, 01-1340, 01-1350
01-1370	Storage needs - pilot tribs	10d	03/21/02	04/04/02	01-1208, 01-1210, 01-1218, 01-1270, 01-1340, 01-1350
01-1373	Tech review - pilot trib analysis Corps	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1376	Tech review - pilot trib analysis SFWMD	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1380	Technical review - pilot tribs analysis	22d	04/04/02	05/06/02	01-1360, 01-1370
01-1390	Base flow estimates - all tribs	66d	05/06/02	08/08/02	01-1280, 01-1373, 01-1376, 01-1380
01-1400	Storm runoff estimates - all tribs	66d	05/06/02	08/08/02	01-1280, 01-1373, 01-1376, 01-1380
01-1410	Base flow P loads - all Tribs	44d	08/08/02	10/10/02	01-1390
01-1420	Storm runoff P loads - all Tribs	44d	08/08/02	10/10/02	01-1400
01-1430	Storage needs - all Tribs	66d	10/10/02	01/21/03	01-1410, 01-1420
01-1440	Bypass estimates - all Tribs	66d	10/10/02	01/21/03	01-1410, 01-1420
01-1450	Data Model Development	44d	12/05/01	02/08/02	01-1200
01-1460	Data Model scenario runs	22d	01/21/03	02/21/03	01-1430, 01-1440, 01-1450
01-1470	PIR Work Plan	44d	01/21/03	03/25/03	01-1430, 01-1440

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1480	Draft Assessment Report	22d	02/21/03	03/25/03	01-1279, 01-1460, 01-1470, 01-1700
01-1485	PDT review - Draft Assess Rpt SFWMD	22d	03/25/03	04/24/03	01-1480
01-1490	PDT review - Draft Assess Rpt Corps	22d	03/25/03	04/24/03	01-1480
01-1492	Public Workshop - Draft Assess Rpt Corps	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10d	04/24/03	05/08/03	01-1485, 01-1490
01-1500	Independent Tech Review - Assessment Rpt	10d	05/08/03	05/22/03	01-1492, 01-1493, 01-1495
01-1510	Final Assessment Report	44d	05/22/03	07/25/03	01-1178, 01-1500
01-1513	PMP Update - Assess Phase Corps	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1516	PMP Update - Assess Phase SFWMD	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1520	PMP Update - Assess Phase Contract	44d	05/22/03	07/25/03	01-1173, 01-1175, 01-1177, 01-1178, 01-1500
01-1522	RECOVER - TC/NS Participation	330d	07/25/03	11/18/04	01-1513, 01-1516, 01-1520
01-1525	Cooperative Agreement w/ USGS (Corps)	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1527	Cooperative Agreement w/USGS (SFWMD)	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1528	Define monitoring objectives SFWMD	10d	07/13/01	07/26/01	01-1160, 01-1170
01-1529	Define monitoring objectives USGS	10d	07/13/01	07/26/01	01-1160, 01-1170
01-1530		10d	07/13/01	07/26/01	01-1160, 01-1170
01-1531	RECOVER - Monitoring Design participation	100d	07/27/01	12/20/01	01-1528, 01-1529, 01-1530
01-1532	Monitoring Design/Imp Coordination	2600d	10/31/01	03/29/12	01-1525, 01-1527
01-1534	Monitoring Design/Imp Coordination Corps	2600d	10/31/01	03/30/12	01-1525, 01-1527
01-1535	TCNS PIR Proj Mgt - Corps	550d	07/25/03	10/05/05	01-1520
01-1537	TCNS PIR Proj Mgt - SFWMD	550d	07/25/03	10/05/05	01-1520
01-1538	Pln Tech Lead - TCNS	550d	07/25/03	10/05/05	01-1520
01-1540	Identify potential monitoring sites	66d	07/27/01	10/30/01	01-1528, 01-1529, 01-1530
01-1550	Site & parameter selection	44d	10/31/01	01/07/02	01-1540
01-1560	Monitoring site design	22d	01/08/02	02/07/02	01-1550
01-1570	Cost estimate for network	22d	02/08/02	03/12/02	01-1531, 01-1560
01-1572	RECOVER Monitoring Plan Review	22d	03/13/02	04/11/02	01-1570
01-1573	Monitoring Network Design Approval - Corps	44d	04/12/02	06/13/02	01-1572
01-1574	Monitoring Network Design Approval - SFWMD	44d	04/12/02	06/13/02	01-1572
01-1575	Obtain Real Estate for Gages SFWMD	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1577	Obtain Real Estate for Gages Corps	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1580	Obtain real estate USGS	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1590	Purchase equipment	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1600	Purchase supplies & materials	44d	06/14/02	08/15/02	01-1573, 01-1574

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1610	Construction of monitoring sites	132d	10/21/02	05/01/03	01-1575, 01-1577, 01-1580, 01-1590, 01-1600
01-1620	Post-construction tasks	33d	05/02/03	06/18/03	01-1610
01-1630	Monitoring Network Ops - establish schedules	10d	06/14/02	06/27/02	01-1573, 01-1574
01-1640	Operations Plans & Quality Assurance	88d	06/14/02	10/18/02	01-1573, 01-1574
01-1650	Monitoring site maintenance & repair	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1660	Discharge measurements/WQ sonde maintenance	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1670	Auto-sampler servicing	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1680	Water Quality Sampling	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1690	Sediment sampling	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1700	Existing level of flood protection	44d	01/08/02	03/13/02	01-1250
01-1710	Data collection ET	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1720	Data processing - stream flow	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1730	Processing continuous WQ data	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1740	Shipment of samples to laboratory	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1750	Review lab results	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1755	Data Interpretation and reporting	2640d	06/19/03	01/14/14	01-1620, 01-1630, 01-1640
01-1760	Provide data	2640d	06/19/03	01/13/14	01-1620, 01-1630, 01-1640
01-1761	Topo Data Collection - TCNS	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-1762	Geotech Data Collection - TCNS	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-1763	Initial Alternative Plans - TCNS Corps	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1767	Inital Alternative Plans - TCNS SFWMD	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1770	Initial Alternative Plans - TCNS Contractor	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1771	Real estate data collection - TCNS	22d	07/25/03	08/26/03	01-1513, 01-1516, 01-1520
01-1772	Plan formulation - economics input - TCNS	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWMD	22d	09/26/03	10/29/03	01-1763, 01-1767, 01-1770, 01-1772
01-1780	Final Alternative Plans - TCNS	22d	10/29/03	12/03/03	01-1771, 01-1773, 01-1775, 01-1777
01-1790	Alternative Descriptions - TCNS	22d	12/03/03	01/06/04	01-1780
01-1795	PDT Alt Plan comments - TCNS SFWMD	22d	01/06/04	02/06/04	01-1790
01-1800	PDT Alt Plan Comments - TCNS Corps	22d	01/06/04	02/06/04	01-1790
01-1805	Alt Form Briefing - TCNS	10d	02/06/04	02/23/04	01-1795, 01-1800
01-1810	Final Alternative Plan Document - TCNS	22d	02/23/04	03/24/04	01-1795, 01-1800, 01-1805
01-1820	Alt Plan Conceptual Design - TCNS	44d	03/24/04	05/25/04	01-1761, 01-1762, 01-1810
01-1830	Alt Plan Cost Estimates - TCNS	44d	05/25/04	07/28/04	01-1820

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-1840	H&H Evaluation of Alternative Plans - TCNS	44d	03/24/04	05/25/04	01-1761, 01-1762, 01-1810
01-1850	Socio-Economic Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1860	Real Estate Cost Est Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1870	Environmental Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	01-1840
01-1880	Draft Alt Plan Evaluation Document - TCNS	22d	08/27/04	09/29/04	01-1830, 01-1850, 01-1860, 01-1870
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFWMD	22d	09/29/04	11/01/04	01-1880, 01-1920, 01-1930, 01-1940, 01-1950, 01-1958
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corps	22d	09/29/04	11/01/04	01-1880, 01-1920, 01-1930, 01-1940, 01-1950, 01-1958
01-1900	Independent Tech Review - Evaluation Doc - TC...	22d	11/01/04	12/06/04	01-1885, 01-1890
01-1910	Final Evaluation Document - TCNS	22d	12/06/04	01/07/05	01-1900
01-1920	Environmental Eval Appendix - TCNS	22d	08/27/04	09/29/04	01-1870
01-1930	Eng & Design Appendix - TCNS	22d	07/28/04	08/27/04	01-1830, 01-1840
01-1940	Socio-Economic Appendix - TCNS	22d	08/27/04	09/29/04	01-1850
01-1950	Real Estate Appendix - TCNS	22d	08/27/04	09/29/04	01-1860
01-1956	Endangered Species Consultation - TCNS	65d	03/24/04	06/24/04	01-1810
01-1957	Draft Fish & Wildlife Coord Act Report - TCNS	98d	03/24/04	08/11/04	01-1810
01-1958	Draft water control plan - TCNS	22d	05/25/04	06/25/04	01-1840
01-1959	Cultural Resources Initial Assessment - TCNS	120d	03/24/04	09/13/04	01-1810
01-1960	Draft Report - TCNS	22d	01/07/05	02/09/05	01-1522, 01-1910, 01-1920, 01-1930, 01-1940, 01-1950, 01-1957, 01-1958, 01-1959
01-1961	RECOVER review Draft Report - TCNS	22d	02/09/05	03/14/05	01-1960
01-1962	Final FWS - CAR - TCNS	80d	08/11/04	12/08/04	01-1957
01-1963	PDT Review Draft Report - TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1966	PDT Review Draft Report - TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-1968	TCNS Final Deliverable Draft Report	22d	02/09/05	03/14/05	01-1960
01-1970	Public Review DEIS - TCNS	66d	03/14/05	06/15/05	01-1963, 01-1966, 01-1968
01-1975	PDT Comparison Alt Plans - TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-1980	PDT Comparison Alt Plans - TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22d	02/09/05	03/14/05	01-1960
01-1993	Pub Wkshp - Draft Report TCNS Corps	22d	02/09/05	03/14/05	01-1960
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22d	02/09/05	03/14/05	01-1960
01-2003	Final Draft Report TCNS Corps	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996, 01-2033, 01-1962
01-2006	Final Draft Report TCNS SFWMD	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996, 01-2033, 01-2034, 01-1..
01-2010	Public Review - Final Report - TCNS	44d	08/17/05	10/20/05	01-2003, 01-2006, 01-1956
01-2013	Pub Wkshp - Final Report - TCNS Corps	22d	08/17/05	09/19/05	01-2003, 01-2006
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22d	08/17/05	09/19/05	01-2003, 01-2006
01-2023	ROD - TCNS Corps	44d	10/20/05	12/27/05	01-2010, 01-2013, 01-2016

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2030	ROD - TCNS SFWMD	44d	10/20/05	12/27/05	01-2010, 01-2013, 01-2016
01-2033	TCNS PIR update of PMP SFWMD	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996
01-2034	TCNS PIR update of PMP Corps	44d	06/15/05	08/17/05	01-1961, 01-1970, 01-1975, 01-1980, 01-1990, 01-1993, 01-1996
01-2035	Congressional Committee Approval - TCNS	176d	12/27/05	09/07/06	01-1535, 01-1537, 01-1538, 01-2023, 01-2030
01-2036	RECOVER - LO PIR participation	500d	07/25/03	07/26/05	01-1513, 01-1516, 01-1520
01-2037	Initial Alternative Plans - LO Corps	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2038	Initial Alternative Plans - LO SFWMD	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2039	Plan formulation - economics input - LO	44d	07/25/03	09/26/03	01-1513, 01-1516, 01-1520
01-2040	Initial Alternative Plans - LO Contractor	66d	07/25/03	10/29/03	01-1513, 01-1516, 01-1520
01-2041	Topo Data collection - LO	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-2042	Geotech Data collection - LO	132d	07/25/03	02/06/04	01-1513, 01-1516, 01-1520
01-2043	Public Workshop - Alt Plans - LO Corps	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2046	Public Workshop - Alt Plans - LO SFWMD	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2050	Public Workshop - Alt Plans - LO Contractor	22d	10/29/03	12/03/03	01-2037, 01-2038, 01-2039, 01-2040
01-2051	Real estate data collection - LO	22d	07/25/03	08/26/03	01-1513, 01-1516, 01-1520
01-2052	LO PIR Proj Mgt - Corps	1300d	07/25/03	10/06/08	01-1520
01-2054	LO PIR Proj Mgt - SFWMD	1300d	07/25/03	10/06/08	01-1520
01-2055	Plan Tech Lead - LO PIR	1300d	07/25/03	10/06/08	01-1520
01-2060	Final Alt Plans - LO	44d	12/03/03	02/06/04	01-2043, 01-2046, 01-2050, 01-2051
01-2070	Alt Plan Descriptions - LO	66d	02/06/04	05/11/04	01-2060
01-2075	PDT Review Alt Plans - LO SFWMD	22d	05/11/04	06/11/04	01-2070
01-2080	PDT Review Alt Plans - LO Corps	22d	05/11/04	06/11/04	01-2070
01-2085	Alt Form Briefing - LO	10d	06/11/04	06/25/04	01-2075, 01-2080
01-2090	Final Alt Plan Document - LO	22d	06/25/04	07/28/04	01-2075, 01-2080, 01-2085
01-2091	Cultural Resources Initial Assessment - LO	120d	07/28/04	01/24/05	01-2090
01-2100	Alt Plan Conceptual Design - LO	88d	07/28/04	12/06/04	01-2041, 01-2042, 01-2090
01-2110	Alt Plans Cost Estimates - LO	66d	12/06/04	03/14/05	01-2100
01-2120	H&H Evaluation of Alt Plans - LO	88d	07/28/04	12/06/04	01-2041, 01-2042, 01-2090
01-2130	Socio-Economic Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2140	Real Estate Cost Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2150	Environmental Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	01-2120
01-2160	Draft Alt Plan Evaluation Document - LO	22d	04/13/05	05/13/05	01-2110, 01-2130, 01-2140, 01-2150, 01-2237
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWMD	22d	05/13/05	06/15/05	01-2160, 01-2200, 01-2210, 01-2220, 01-2230, 01-2237
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22d	05/13/05	06/15/05	01-2160, 01-2200, 01-2210, 01-2220, 01-2230, 01-2237
01-2180	ITR Alt Plan Evaluation - LO	22d	06/15/05	07/18/05	01-2165, 01-2170

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2190	Final Alt Plan Evaluation Report - LO	22d	07/18/05	08/17/05	01-2180
01-2200	Evironmental Evaluation App - LO	22d	04/13/05	05/13/05	01-2150
01-2210	Eng & Design Appendix - LO	22d	03/14/05	04/13/05	01-2110, 01-2120
01-2220	Socio-Economic Evaluation Appendix - LO	22d	04/13/05	05/13/05	01-2130
01-2230	Real Estate Evaluation Appendix - LO	22d	04/13/05	05/13/05	01-2140
01-2233	Endangered Species Consultation - LO	64d	07/28/04	10/28/04	01-2090
01-2234	Draft Fish & Wildlife Coord Act Report - LO PIR	220d	07/28/04	06/15/05	01-2090
01-2236	Final FWS - CAR - LO	10d	06/15/05	06/29/05	01-2234
01-2237	Draft water control plan - LO	44d	12/06/04	02/09/05	01-2120
01-2240	Draft PIR/EIS - LO	22d	08/17/05	09/19/05	01-2036, 01-2190, 01-2200, 01-2210, 01-2220, 01-2230, 01-2233, 01-2234, 01-2237, 01-2..
01-2241	RECOVER Review Draft PIR/EIS - LO	22d	09/19/05	10/20/05	01-2240
01-2243	PDT Review Draft PIR/EIS - LO Corps	44d	09/19/05	11/22/05	01-2240
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44d	09/19/05	11/22/05	01-2240
01-2248	Final Deliverable Draft PIR/EIS - LO	44d	09/19/05	11/22/05	01-2240
01-2250	Public Review Draft PIR/EIS - LO	66d	11/22/05	03/02/06	01-2248, 01-2241, 01-2243, 01-2246
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22d	11/22/05	12/27/05	01-2243, 01-2246, 01-2248
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22d	11/22/05	12/27/05	01-2243, 01-2246, 01-2248
01-2273	Final Draft PIR/EIS - LO Corps	44d	03/02/06	05/03/06	01-2253, 01-2256, 01-2250, 01-2236
01-2276	Final Draft PIR/EIS - LO SFWMD	44d	03/02/06	05/03/06	01-2253, 01-2256, 01-2250, 01-2236
01-2277	LO PIR PMP update Corps	66d	05/03/06	08/07/06	01-2273, 01-2276
01-2278	LO PIR PMP update SFWMD	66d	05/03/06	08/07/06	01-2273, 01-2276
01-2290	Public Review Final PIR/EIS	44d	05/03/06	07/06/06	01-2273, 01-2276
01-2301	Public Workshop - Final PIR/EIS - LO SFWMD	22d	05/03/06	06/05/06	01-2273, 01-2276
01-2302	Public Workshop - Final PIR/EIS - LO Corps	22d	05/03/06	06/05/06	01-2273, 01-2276
01-2303	ROD - LO SFWMD	44d	07/06/06	09/07/06	01-2301, 01-2302, 01-2290
01-2310	ROD - LO Corps	44d	07/06/06	09/07/06	01-2301, 01-2302, 01-2290
01-2320	DDR - TCNS	242d	08/17/05	08/07/06	01-2003, 01-2006
01-2330	DDR - LO	455d	09/07/06	07/03/08	01-2277, 01-2278, 01-2303, 01-2310
01-2340	Congressional Authorization - LO	264d	10/06/08	10/27/09	01-2052, 01-2054, 01-2055, 01-2303, 01-2310
01-2350		150d	08/07/06	03/16/07	01-2320
01-2360	Real Estate Acquisition - LO	300d	07/03/08	09/15/09	01-2330
01-2370	Plans & Specs - TCNS	242d	08/07/06	07/26/07	01-2320
01-2380	Plans & Specs - LO	350d	07/03/08	11/30/09	01-2330
01-2390	PCA - TCNS	66d	09/07/06	12/14/06	01-2035
01-2400	PCA - LO	66d	10/27/09	02/04/10	01-2340

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors
01-2410	Construction - TCNS	482d	07/26/07	06/30/09*	01-2350, 01-2370, 01-2390
01-2420	Constructon - LO	850d	02/04/10	06/27/13	01-2340, 01-2360, 01-2380, 01-2400

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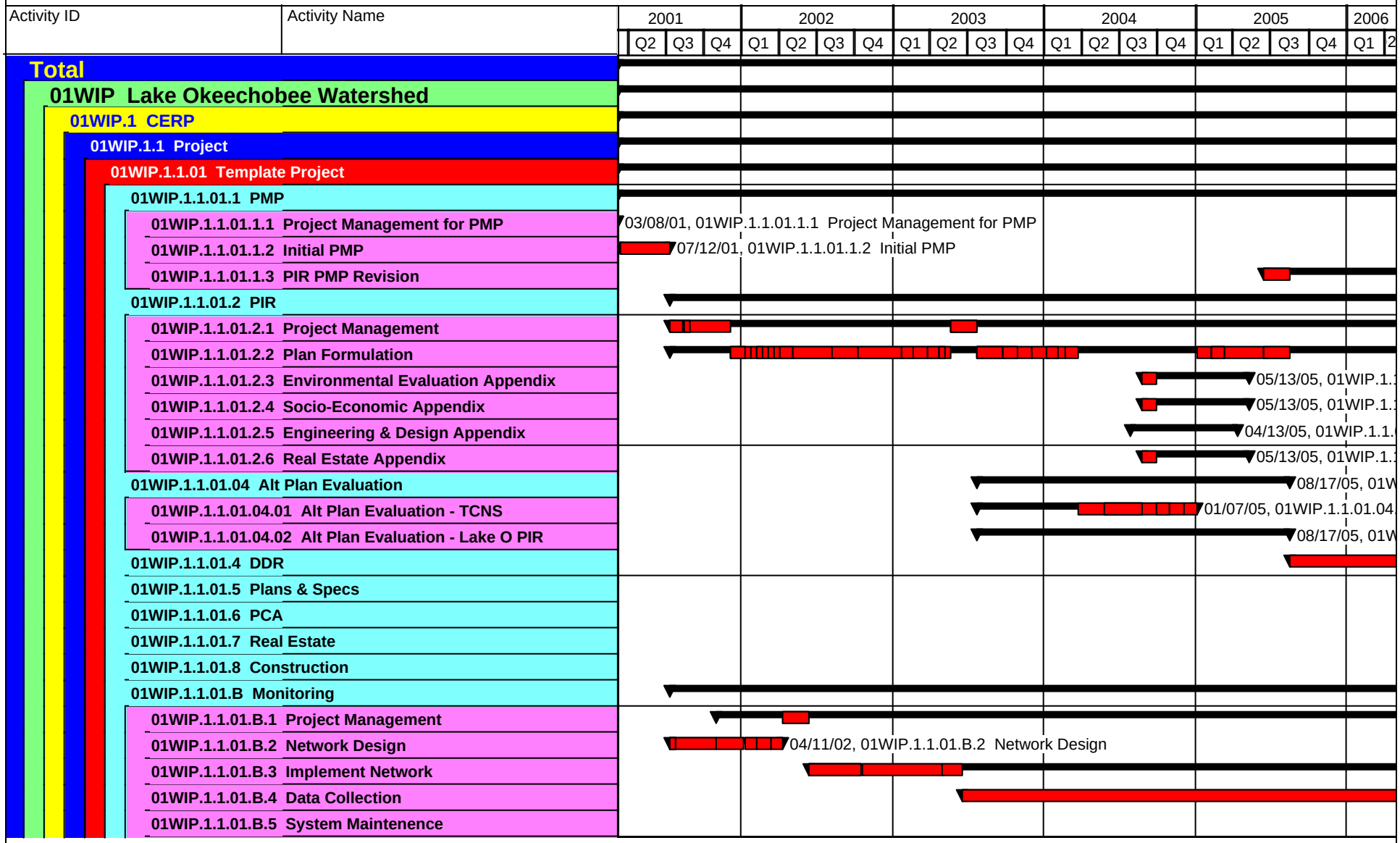
TAB B of Appendix D– Project Gantt Chart



Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

TASK filter: All Activities

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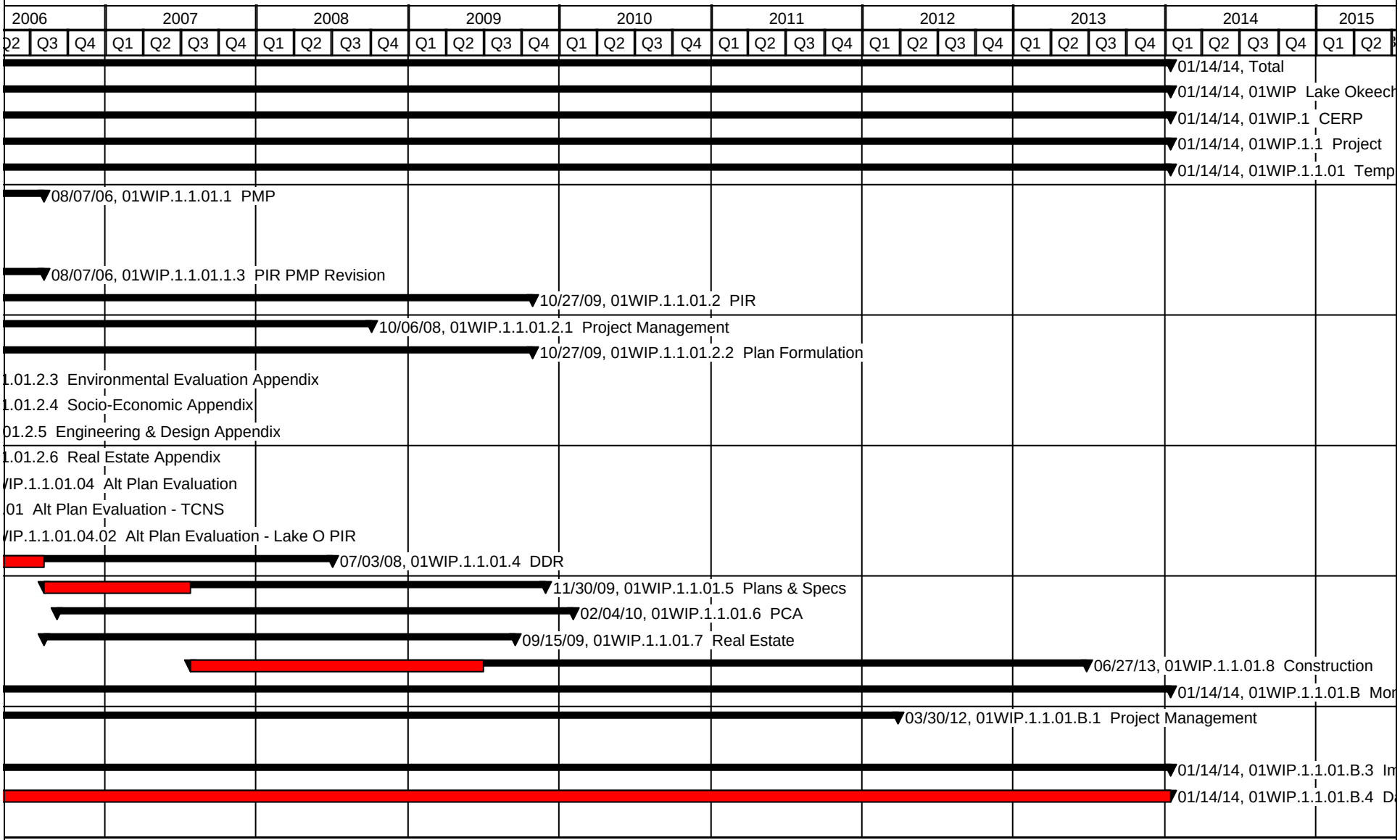

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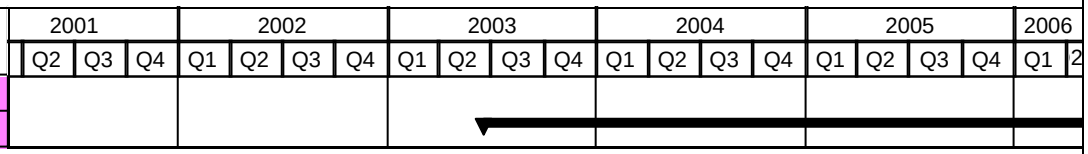
Activity ID	Activity Name
01WIP.1.1.01.B.6	Data Management
01WIP.1.1.01.B.7	Data Interpretation



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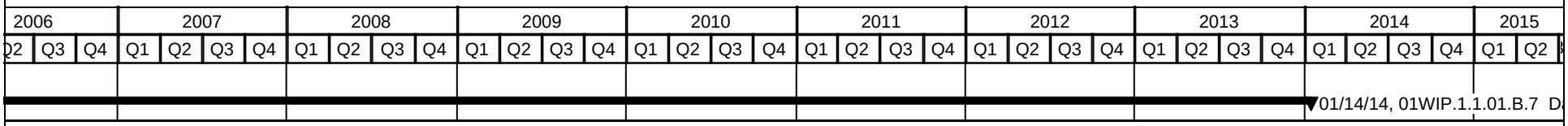

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TAB C of Appendix D– Organizational Breakdown Structure

The Organization Breakdown Structure (OBS) identifies the organizations within the Corps of Engineers responsible for performing work required for project implementation. Office titles and symbols of organizations that will participate in the project and their Resource Identifier (US/PLAN) are listed below:

UNITED STATES ARMY ENGINEER DISTRICT, JACKSONVILLE (US)

Project Management (DP)

DP	Deputy District Engineer for Programs and Project Management	
DR	Restoration Program Division	
DR-C	Central Florida Restoration Branch	(US/PM)
DR-R	Coordination Branch	(US/PR)

Construction-Operations Division (CO)

CO-C Construction Branch
CO-CC Contract Administration Section
CO-CQ Quality Assurance Section
CO-CS Construction Services Section
CO-E Readiness Branch
CO-W South Florida Area Office, Palm Beach Gardens
CO-S South Florida Operations Office, Clewiston
CO-O Operations Technical Support Branch

Contracting Division (CT) (US/PROC)

CT-C	AE and Construction Branch	
CT-S	Services Branch	

Engineering Division (EN)

EN-C	Cost Engineering Branch	(US/COST)
EN-D	Design Branch	(US/ENGD) includes 6 sections listed
EN-DC	Specifications Section	
EN-DL	Levees and Waterway Section	
EN-DM	Mechanical & Electrical Section	
EN-DS	Structures Section	
EN-DT	Survey Section	
EN-DP	Special Projects Section	
EN-G	Geotechnical Branch	(US/GEOG), includes 3 sections listed
EN-GS	Soils Section	
EN-GG	Geology and Exploration Section	
EN-GE	Environmental/HTRW Section	
EN-H	Hydrology & Hydraulics Branch	(US/HH), includes the 4 sect listed
EN-HC	Coastal Design Section	
EN-HH	Hydraulic Data and Design Section	

EN-HI	Hydrologic Investigation Section	
EN-HW	Meteorology & Operations Section	
EN-T	Technical Services Branch	
VE	Value Engineering Officer	

Planning Division (PD)

PD-E	Environmental Branch	(US/BIO), includes four sections listed
PD-EA	Atlantic Coast Section	
PD-ES	South Florida Section	
PD-EG	Gulf Coast Section	
PD-EP	Special Projects Section	
PD-D	Socio-Economics Branch	(US/ECON)
PD-P	Plan Formulation Branch	(US/PLAN)
PD-N	Coastal Navigation Section	
PD-PF	Flood Control & Flood Plain Mgmt. Section	
PD-R	Ecosystem Restoration Branch	(US/BIO)

Real Estate Division (RE)		(US/RE)
RE-A	Acquisition Branch	
RE-S	Appraisal Branch	

OFFICE OF COUNSEL (OC) (US/OC)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT (WM)

Office of Counsel (OC)		**(WM/OC**
OC-EWL	Environmental and Water Law	
Water Supply (WS)		(WM/HH)
WS-HSM	Hydrologic Systems Modeling	(WM/MOD)
WS-WSPD	Water Supply Planning & Development	
WS-TRT	Technology Resource Team	

Watershed Management (WM)

WM-CE	Coastal Ecosystems
WM-EV	Everglades
WM-KI	Kissimmee
WM-LO	Lake Okeechobee

Engineering, and Construction (EC)

REC-EPM	Engineering & Project Management	(WM/ENG)
REC-CO	Construction	(WM/CO)
Okeechobee Service Center (OKS)		(WM/OUT)
Permitting		(WM/PERM)

Operations Control (OPC)		(WM/OPS)
OPC-OPS	Operations Control Center	
OPC-EO	Environmental Operations	
Environmental Monitoring and Assessment (EMA)		(WM/HH)
EMA-HISA	Hydrologic Information Systems & Assessment	(WM/MON)
EMA-HH	Hydrology & Hydraulics	
EMA-WQ	Water Quality	
Procurement (PRO)		(WM-PROC)
PRO-CN	Contracts	
PRO-EC	Equity in Contracting	
PRO-PU	Purchasing	
Program and Project Management (PPM)		
PPM-PM	Project Management	(WM-PM)
PPM-SWCA	System Wide & Coordination Activities	
PPM-PI	Project Implementation	(WM/ECON)
PPM-ET	Ecological Technologies	
PPM-PC	Program Controls	
PPM-EE	Environmental Engineering	
PPM-RE	Real Estate	(WM/RE)

CONTRACTOR/A-E	(CO)
GIS/CADD Services	(CO/GIS)
Water Quality	(CO/WQ)
H&H Engineering	(CO/MODEL)
Economist	(CO-ECON)
Engineering, Design	(CO/ENGD)
Geotechnical Engineering	(CO/GEOG)
Hydrologist	(CO/HYDRO)
Biologist	(CO/BIOT)
Real Estate	(CO/RE)
Project Management	(CO/PM)
Hydrologist	(CO/ENGH)
Planner	(CO/PLAN)
Public Relations	(CO/PR)
Ecologist	(CO/ECOL)
Socioeconomics	(CO/SOCIO)

INDEPENDENT TECHNICAL REVIEW TEAM	(ITR)
Planning Division	
Engineering Division	

Construction-Operations Division

TAB D of Appendix D– Responsibility Matrix

Lake Okeechobee Watershed

Responsibility Matrix

Contractor - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$20,064
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$20,064
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$10,032
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$8,550
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$4,560

Summary for ' Contractor - Biologist (15 detail records)

Sum for Resource ***$94,838***

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$2,280
01-1820	Alt Plan Conceptual Design - TCNS	44	3/24/04	5/25/04	22	$1,539
01-1830	Alt Plan Cost Estimates - TCNS	44	5/25/04	7/28/04	22	$20,064
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1930	Eng & Design Appendix - TCNS	22	7/28/04	8/27/04	22	$5,016
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2110	Alt Plans Cost Estimates - LO	66	12/6/04	3/14/05	202	$30,096
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$1,140
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Cost Estimator (15 detail records)

Sum for Resource ***$89,091***

Contractor - Cultural Resour

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1959	Cultural Resources Initial Assessment - TC	120	3/24/04	9/13/04	78	$300,276
01-2091	Cultural Resources Initial Assessment - LO	120	7/28/04	1/24/05	324	$50,160

Summary for ' Contractor - Cultural Resource (2 detail records)

Sum for Resource ***$350,436***

Contractor - Design Enginee

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$4,560
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$5,016
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1820	Alt Plan Conceptual Design - TCNS	44	3/24/04	5/25/04	22	$20,064
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1920	Environmental Eval Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1930	Eng & Design Appendix - TCNS	22	7/28/04	8/27/04	22	$5,016
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$1,368
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2041	Topo Data collection - LO	132	7/25/03	2/6/04	300	$10,032
01-2042	Geotech Data collection - LO	132	7/25/03	2/6/04	300	$10,032
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$22,800
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$6,840
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$28,500
01-2110	Alt Plans Cost Estimates - LO	66	12/6/04	3/14/05	202	$6,840
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016

Summary for ' Contractor - Design Engineer (27 detail records)

Sum for Resource ***$180,348***

Contractor - Ecologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1920	Environmental Eval Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$4,560
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$40,128
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$8,550
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Ecologist (18 detail records)

Sum for Resource ***$120,954***

Contractor - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1260	Future land use projections	44	12/5/01	2/8/02	8	$10,032
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1772	Plan formulation - economics input - TCNS	44	7/25/03	9/26/03	0	$11,400
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$229,425
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$30,096
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1940	Socio-Economic Appendix - TCNS	22	8/27/04	9/29/04	0	$10,032
01-2039	Plan formulation - economics input - LO	44	7/25/03	9/26/03	202	$10,032
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$256,500
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$10,032
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Economist (17 detail records)

Sum for Resource ***$592,629***

Contractor - Geographer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032

Summary for ' Contractor - Geographer (1 detail record)

Sum for Resource ***$10,032***

Contractor - GIS Tech

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$2,280
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$18,639
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$2,280
01-1320	Base flow estimate - pilot tribs	10	2/21/02	3/7/02	0	$1,368
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$2,280
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1350	P load estimates - storm flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1360	Bypass flow estimates - pilot tribs	10	3/21/02	4/4/02	0	$2,280
01-1370	Storage needs - pilot tribs	10	3/21/02	4/4/02	0	$1,026
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$1,368
01-1390	Base flow estimates - all tribs	66	5/6/02	8/8/02	0	$10,032
01-1400	Storm runoff estimates - all tribs	66	5/6/02	8/8/02	0	$10,032
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$6,669
01-1430	Storage needs - all Tribs	66	10/10/02	1/21/03	0	$14,250
01-1440	Bypass estimates - all Tribs	66	10/10/02	1/21/03	0	$14,250
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$2,280
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$2,280
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560
01-1860	Real Estate Cost Est Alt Plans - TCNS	66	5/25/04	8/27/04	0	$10,032
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$5,016
01-1950	Real Estate Appendix - TCNS	22	8/27/04	9/29/04	0	$2,280

01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$10,032
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$6,840
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$22,800
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$10,032
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$17,100
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$228
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$2,280

Summary for ' Contractor - GIS Tech (43 detail records)

Sum for Resource ***$289,218***

Contractor - H&H Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280
01-1700	Existing level of flood protection	44	1/8/02	3/13/02	236	$10,032
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$4,560
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$4,560
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$10,032
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1958	Draft water control plan - TCNS	22	5/25/04	6/25/04	66	$5,700
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$2,280
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$11,400
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$17,100
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$11,400

01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$2,280
01-2237	Draft water control plan - LO	44	12/6/04	2/9/05	224	$11,400
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - H&H Engineer (28 detail records)

Sum for Resource ***$153,672***

Contractor - Hydro Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1220	Land use & soil data	22	12/5/01	1/8/02	0	$10,032
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$4,560
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$1,881
01-1290	Identify Pilot Tributaries	10	1/8/02	1/23/02	0	$4,560
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$2,280
01-1310	Select analytical method Contractor	10	2/6/02	2/21/02	0	$4,560
01-1320	Base flow estimate - pilot tribs	10	2/21/02	3/7/02	0	$4,560
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$4,560
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$4,560
01-1350	P load estimates - storm flow - pilot tribs	10	3/7/02	3/21/02	0	$4,560
01-1360	Bypass flow estimates - pilot tribs	10	3/21/02	4/4/02	0	$4,560
01-1370	Storage needs - pilot tribs	10	3/21/02	4/4/02	0	$4,560
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$2,280
01-1390	Base flow estimates - all tribs	66	5/6/02	8/8/02	0	$14,820
01-1400	Storm runoff estimates - all tribs	66	5/6/02	8/8/02	0	$14,820
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$15,219
01-1420	Storm runoff P loads - all Tribs	44	8/8/02	10/10/02	0	$15,219
01-1430	Storage needs - all Tribs	66	10/10/02	1/21/03	0	$14,592
01-1440	Bypass estimates - all Tribs	66	10/10/02	1/21/03	0	$14,592
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$10,032
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1700	Existing level of flood protection	44	1/8/02	3/13/02	236	$10,032
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$10,032
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100

01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$2,280
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$28,500
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Hydro Modelor (38 detail records)

Sum for Resource ***$277,647***

Contractor - Hydrologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1240	Lit review - sedimentation/other info	22	12/5/01	1/8/02	0	$10,032
01-1250	Rainfall frequency analysis	22	12/5/01	1/8/02	30	$10,032
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$18,639
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$1,368
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560

Summary for ' Contractor - Hydrologist (6 detail records)

Sum for Resource ***$53,751***

Contractor - Planner

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$6,840
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$4,560
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$1,824
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$10,032
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$10,032
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$11,400
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$10,032
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$10,032

01-1960	Draft Report - TCNS	22	1/7/05	2/9/05	0	$4,560
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$10,032
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$4,560
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$4,560
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$17,100
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$22,800
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$10,032
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$10,032
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$2,280
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$10,032
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$2,280
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$10,032
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280

Summary for ' Contractor - Planner (34 detail records)

Sum for Resource ***$236,312***

Contractor - Project Mgr

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1208	Water Quality Design Criteria Contract	66	12/5/01	3/13/02	6	$2,280
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,824
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1310	Select analytical method Contractor	10	2/6/02	2/21/02	0	$2,280
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$1,368
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1520	PMP Update - Assess Phase Contract	44	5/22/03	7/25/03	0	$10,032
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$10,032
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$2,280
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140

01-1830	Alt Plan Cost Estimates - TCNS	44	5/25/04	7/28/04	22	$1,539
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$2,280
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1960	Draft Report - TCNS	22	1/7/05	2/9/05	0	$4,560
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$2,280
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$6,840
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$6,840
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$4,560
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$13,680
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$2,280
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$2,280
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$2,280
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$228
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Project Mgr (42 detail records)

Sum for Resource ***$187,919***

Contractor - Public Relation

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$4,560
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$4,560
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280

Summary for ' Contractor - Public Relations (7 detail records)

Sum for Resource ***$21,888***

Contractor - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*

01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$1,140
01-1771	Real estate data collection - TCNS	22	7/25/03	8/26/03	44	$10,032
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$5,016
01-1860	Real Estate Cost Est Alt Plans - TCNS	66	5/25/04	8/27/04	0	$30,096
01-1950	Real Estate Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2051	Real estate data collection - LO	22	7/25/03	8/26/03	246	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$6,840
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$6,840
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$10,032
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$6,270
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$17,100
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$10,032
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Real Estate (19 detail records)

Sum for Resource ***$139,422***

Contractor - Sociologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$4,560
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$7,752
01-1940	Socio-Economic Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2039	Plan formulation - economics input - LO	44	7/25/03	9/26/03	202	$4,560
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$6,840
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$2,280
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Sociologist (12 detail records)

Sum for Resource ***$53,124***

Contractor - Technician

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*

01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$24,000
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$24,800

Summary for ' Contractor - Technician (2 detail records)

Sum for Resource ***$48,800***

Contractor - Water Quality

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1208	Water Quality Design Criteria Contract	66	12/5/01	3/13/02	6	$2,280
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$2,736
01-1270	P Settling Rate	22	12/5/01	1/8/02	50	$10,032
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$4,560
01-1420	Storm runoff P loads - all Tribs	44	8/8/02	10/10/02	0	$4,560
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$2,280
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$1,140
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$11,400
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Water Quality (17 detail records)

Sum for Resource ***$72,732***

Corps - Biologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,032
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$4,560
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$4,560
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$22,800
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368

01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$10,944
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,280
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$11,400
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$2,280
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$4,560
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$23,484
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$3,420

Summary for ' Corps - Biologist (33 detail records)

Sum for Resource ***$143,345***

Corps - Cost Estimator

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$2,280
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,824
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$2,280
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560

Summary for ' Corps - Cost Estimator (13 detail records)

Sum for Resource ***$37,905***

Corps - Cultural Resource

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1959	Cultural Resources Initial Assessment - TC	120	3/24/04	9/13/04	78	$60,192
01-2091	Cultural Resources Initial Assessment - LO	120	7/28/04	1/24/05	324	$309,966

Summary for ' Corps - Cultural Resource (2 detail records)

Sum for Resource ***$370,158***

Corps - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$4,959
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$1,881
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$11,742
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$4,959
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$6,270
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$4,959
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$3,705
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$6,270
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$1,254
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$9,918
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$15,504
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$3,705
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$627
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,959
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$1,881

Summary for ' Corps - Design Engineer (19 detail records)

Sum for Resource ***$87,029***

Corps - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$20,064
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280

01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824

Summary for ' Corps - Economist (24 detail records)

Sum for Resource ***$69,872***

Corps - Geotech Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$2,052
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$30,096
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$2,280
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$2,280
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$4,560
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$4,560
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560

01-2042	Geotech Data collection - LO	132	7/25/03	2/6/04	300	$2,280
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$4,560
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$4,560
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,280
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,368
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,368

Summary for ' Corps - Geotech Engineer (29 detail records)

Sum for Resource ***$108,585***

Corps - Hydrology/Hydrauli

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$4,560
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$1,368
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,944
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$4,104
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1305	Select analytical method Corps	10	2/6/02	2/21/02	0	$2,280
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$1,368
01-1373	Tech review - pilot trib analysis Corps	22	4/4/02	5/6/02	0	$7,296
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$4,560
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$3,420
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$3,192
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$4,560
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$22,800
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$4,560
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$4,560
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$20,064
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$4,104
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1958	Draft water control plan - TCNS	22	5/25/04	6/25/04	66	$5,700
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$5,130
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$4,104

01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,736
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$2,736
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$285
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$2,280
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$4,560
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$5,472
01-2237	Draft water control plan - LO	44	12/6/04	2/9/05	224	$11,400
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,736
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$2,736
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$6,840
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$2,736
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$228

Summary for ' Corps - Hydrology/Hydraulics (43 detail records)

Sum for Resource ***$189,743***

Corps - Planning Tech Lead

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1173	Planning Tech Lead - Watershed Assess	450	7/13/01	5/1/03	14	$85,500
01-1218	Water Quality Design Criteria - Corps	66	12/5/01	3/13/02	6	$2,280
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,032
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1538	Pln Tech Lead - TCNS	550	7/25/03	10/5/05	208	$125,400
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,280
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$10,032

01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$4,560
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2055	Plan Tech Lead - LO PIR	1300	7/25/03	10/6/08	135	$296,400
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,280
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$10,032
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$3,420

Summary for ' Corps - Planning Tech Lead (34 detail records)

Sum for Resource ***$600,200***

Corps - Procurement

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$4,560

Summary for ' Corps - Procurement (1 detail record)

Sum for Resource ***$4,560***

Corps - Project Manager

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1175	Proj Mgt - Watershed Assess - Corps	450	7/13/01	5/1/03	14	$85,500
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$10,032
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$4,560
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$912
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$2,280
01-1535	TCNS PIR Proj Mgt - Corps	550	7/25/03	10/5/05	208	$125,400
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2035	Congressional Committee Approval - TCNS	176	12/27/05	9/7/06	154	$2,280
01-2052	LO PIR Proj Mgt - Corps	1300	7/25/03	10/6/08	135	$296,400
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$912

01-2340	Congressional Authorization - LO	264	10/6/08	10/27/09	135	$4,560

Summary for ' Corps - Project Manager (16 detail records)

Sum for Resource ***$541,956***

Corps - Public Outreach

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$2,280
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$2,280
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,824
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$2,280
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824

Summary for ' Corps - Public Outreach (10 detail records)

Sum for Resource ***$20,748***

Corps - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$4,560
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1577	Obtain Real Estate for Gages Corps	88	6/14/02	10/18/02	0	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560

Summary for ' Corps - Real Estate (15 detail records)

Sum for Resource ***$37,781***

Corps - Water Quality

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*

01-1218	Water Quality Design Criteria - Corps	66	12/5/01	3/13/02	6	$2,280
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$2,280
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$1,368
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$4,560
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$1,368
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$2,280
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$1,368
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$1,368
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$1,368
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,368
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280

Summary for ' Corps - Water Quality (17 detail records)

Sum for Resource ***$37,392***

Independent Tech Review

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$9,120
01-1305	Select analytical method Corps	10	2/6/02	2/21/02	0	$9,120
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$9,120
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$9,120
01-1500	Independent Tech Review - Assessment Rp	10	5/8/03	5/22/03	0	$30,400
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$9,120
01-1900	Independent Tech Review - Evaluation Doc	22	11/1/04	12/6/04	0	$30,400
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$9,120
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$9,120
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$9,120
01-2180	ITR Alt Plan Evaluation - LO	22	6/15/05	7/18/05	180	$7,600
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$9,120

Summary for ' Independent Tech Review (12 detail records)

Sum for Resource ***$150,480***

RECOVER POC

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1178	RECOVER - Watershed Assess - PDT parti	450	7/13/01	5/1/03	14	$20,520
01-1522	RECOVER - TC/NS Participation	330	7/25/03	11/18/04	32	$21,489

01-1531	RECOVER - Monitoring Design participatio	100	7/27/01	12/20/01	32	$5,700
01-2036	RECOVER - LO PIR participation	500	7/25/03	7/26/05	196	$47,481

Summary for ' RECOVER POC (4 detail records)

Sum for Resource ***$95,190***

RECOVER Team

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1572	RECOVER Monitoring Plan Review	22	3/13/02	4/11/02	0	$22,800
01-1961	RECOVER review Draft Report - TCNS	22	2/9/05	3/14/05	66	$45,600
01-2241	RECOVER Review Draft PIR/EIS - LO	22	9/19/05	10/20/05	202	$28,500

Summary for ' RECOVER Team (3 detail records)

Sum for Resource ***$96,900***

SFWMD - Counsel

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$2,280
01-1210	Water Quality Design Criteria SFWMD	66	12/5/01	3/13/02	6	$1,140

Summary for ' SFWMD - Counsel (2 detail records)

Sum for Resource ***$3,420***

SFWMD - Economist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$10,032
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$2,736
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$1,368
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$4,560
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$1,368
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$4,560
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,368
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22	2/9/05	3/14/05	66	$2,280
01-2006	Final Draft Report TCNS SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,368
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622

01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$2,280
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Economist (24 detail records)

Sum for Resource ***$60,068***

SFWMD - Engineering Desi

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Engineering Design (4 detail records)

Sum for Resource ***$11,400***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1220	Land use & soil data	22	12/5/01	1/8/02	0	$1,824
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$1,824
01-1240	Lit review - sedimentation/other info	22	12/5/01	1/8/02	0	$1,824
01-1250	Rainfall frequency analysis	22	12/5/01	1/8/02	30	$1,824
01-1270	P Settling Rate	22	12/5/01	1/8/02	50	$1,824
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$10,032
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$1,368
01-1302	Select analytical method SFWMD	10	2/6/02	2/21/02	0	$1,824
01-1376	Tech review - pilot trib analysis SFWMD	22	4/4/02	5/6/02	0	$2,280
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$1,368
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$4,560
01-1528	Define monitoring objectives SFWMD	10	7/13/01	7/26/01	0	$1,140
01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$2,280
01-1767	Inital Alternative Plans - TCNS SFWMD	44	7/25/03	9/26/03	0	$2,280
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$1,368
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$4,560
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,368
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22	2/9/05	3/14/05	66	$2,280
01-2006	Final Draft Report TCNS SFWMD	44	6/15/05	8/17/05	0	$3,021

01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,368
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$2,280
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Modelor (31 detail records)

Sum for Resource ***$75,012***

SFWMD - Monitoring

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$912,000
01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$6,840
01-1755	Data Interpretation and reporting	2640	6/19/03	1/14/14	0	$342,000

Summary for ' SFWMD - Monitoring (4 detail records)

Sum for Resource ***$1,265,400***

SFWMD - Operations

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$2,280
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,368
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280
01-1767	Inital Alternative Plans - TCNS SFWMD	44	7/25/03	9/26/03	0	$2,280
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$2,280
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,824
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$2,280
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$1,140
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Operations (16 detail records)

Sum for Resource ***$36,252***

SFWMD - Permits

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1210	Water Quality Design Criteria SFWMD	66	12/5/01	3/13/02	6	$4,560
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Permits (3 detail records)

Sum for Resource ***$12,141***

SFWMD - Procurement

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1182	Scope of Work AE Contract - SFWMD	22	7/13/01	8/13/01	0	$2,280
01-1190	Gov't Estimate SFWMD	10	8/14/01	8/28/01	0	$4,560
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$3,420
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560

Summary for ' SFWMD - Procurement (4 detail records)

Sum for Resource ***$14,820***

SFWMD - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1177	Proj Mgt - Watershed Assess - SFWMD	450	7/13/01	5/1/03	14	$205,200
01-1182	Scope of Work AE Contract - SFWMD	22	7/13/01	8/13/01	0	$10,032
01-1190	Gov't Estimate SFWMD	10	8/14/01	8/28/01	0	$4,560
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$3,420
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,368
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10	4/24/03	5/8/03	0	$2,280
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560
01-1528	Define monitoring objectives SFWMD	10	7/13/01	7/26/01	0	$2,280
01-1537	TCNS PIR Proj Mgt - SFWMD	550	7/25/03	10/5/05	208	$250,800
01-2030	ROD - TCNS SFWMD	44	10/20/05	12/27/05	154	$1,539
01-2054	LO PIR Proj Mgt - SFWMD	1300	7/25/03	10/6/08	135	$592,800
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824
01-2303	ROD - LO SFWMD	44	7/6/06	9/7/06	180	$912

Summary for ' SFWMD - Project Manager (14 detail records)

Sum for Resource ***$1,083,855***

SFWMD - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,824
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10	4/24/03	5/8/03	0	$2,280

01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$2,280
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,824
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$2,280
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Public Outreach (12 detail records)

Sum for Resource ***$25,764***

SFWMD - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$10,032
01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$2,280
01-1575	Obtain Real Estate for Gages SFWMD	88	6/14/02	10/18/02	0	$22,800
01-1771	Real estate data collection - TCNS	22	7/25/03	8/26/03	44	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368
01-2051	Real estate data collection - LO	22	7/25/03	8/26/03	246	$2,736
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$1,140
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Real Estate (20 detail records)

Sum for Resource ***$71,696***

US Fish & Wildlife Biologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1956	Endangered Species Consultation - TCNS	65	3/24/04	6/24/04	485	$0

01-1957	Draft Fish & Wildlife Coord Act Report - TC	98	3/24/04	8/11/04	100	$508,440
01-1962	Final FWS - CAR - TCNS	80	8/11/04	12/8/04	130	$9,244
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$0
01-2233	Endangered Species Consultation - LO	64	7/28/04	10/28/04	380	$0
01-2234	Draft Fish & Wildlife Coord Act Report - LO	220	7/28/04	6/15/05	224	$604,770
01-2236	Final FWS - CAR - LO	10	6/15/05	6/29/05	346	$151,050
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$0

Summary for ' US Fish & Wildlife Biologist (8 detail records)

Sum for Resource ***$1,273,504***

USGS Evapo-Trans Speciali

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$28,500
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560

Summary for ' USGS Evapo-Trans Specialist (2 detail records)

Sum for Resource ***$33,060***

USGS GIS

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$10,032

Summary for ' USGS GIS (1 detail record)

Sum for Resource ***$10,032***

USGS Hydrologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$285,000
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$25,650
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1755	Data Interpretation and reporting	2640	6/19/03	1/14/14	0	$285,000
01-1760	Provide data	2640	6/19/03	1/13/14	0	$1,203,840

Summary for ' USGS Hydrologist (12 detail records)

Sum for Resource ***$1,952,478***

USGS Procurement

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*

01-1590	Purchase equipment	88	6/14/02	10/18/02	0	$10,032
01-1600	Purchase supplies & materials	44	6/14/02	8/15/02	44	$2,280

Summary for ' USGS Procurement (2 detail records)

Sum for Resource ***$12,312***

USGS Student Assistant

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$15,000

Summary for ' USGS Student Assistant (1 detail record)

Sum for Resource ***$15,000***

USGS Technician

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1560	Monitoring site design	22	1/8/02	2/7/02	0	$5,016
01-1560	Monitoring site design	22	1/8/02	2/7/02	0	$5,016
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$60,192
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$13,965
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$10,032
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840
01-1710	Data collection ET	2640	6/19/03	1/14/14	0	$296,400
01-1720	Data processing - stream flow	2640	6/19/03	1/14/14	0	$1,037,400
01-1730	Processing continuous WQ data	2640	6/19/03	1/13/14	0	$598,500
01-1740	Shipment of samples to laboratory	2640	6/19/03	1/13/14	0	$199,500
01-1750	Review lab results	2640	6/19/03	1/14/14	0	$107,673
01-1760	Provide data	2640	6/19/03	1/13/14	0	$1,203,840

Summary for ' USGS Technician (20 detail records)

Sum for Resource ***$7,343,652***

USGS WQ Data Retrieval/A

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1650	Monitoring site maintenance & repair	2640	6/19/03	1/14/14	0	$245,100

01-1670	Auto-sampler servicing	2640	6/19/03	1/13/14	0	$1,026,000
01-1680	Water Quality Sampling	2640	6/19/03	1/13/14	0	$1,203,840
01-1680	Water Quality Sampling	2640	6/19/03	1/13/14	0	$1,203,840
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$367,023
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$367,023

Summary for ' USGS WQ Data Retrieval/Anal (8 detail records)

Sum for Resource ***$4,454,094***

USGS WQ Network Design

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$25,650
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1580	Obtain real estate USGS	88	6/14/02	10/18/02	132	$10,260
01-1590	Purchase equipment	88	6/14/02	10/18/02	0	$10,032
01-1600	Purchase supplies & materials	44	6/14/02	8/15/02	44	$2,280
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$60,192
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1650	Monitoring site maintenance & repair	2640	6/19/03	1/14/14	0	$245,100

Summary for ' USGS WQ Network Design (11 detail records)

Sum for Resource ***$432,858***

Grand Total ***$23,751,471***

Appendix E: Project Cost Estimate and Budget

TAB A of Appendix E– Total Project Cost Summary by Work Breakdown Structure Activity

Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01WIP Lake Okeechobee Watershed		3212d	03/08/01	01/14/14	$455,856,728.01	$432,105,256.64	0d
01WIP.1 CERP		3212d	03/08/01	01/14/14	$455,856,728.01	$432,105,256.64	0d
01WIP.1.1 Project		3212d	03/08/01	01/14/14	$455,856,728.01	$432,105,256.64	0d
01WIP.1.1.01 Template Project		3212d	03/08/01	01/14/14	$455,856,728.01	$432,105,256.64	0d
01WIP.1.1.01.1 PMP		1355d	03/08/01	08/07/06	$68,343.00	$0.00	202d
01WIP.1.1.01.1.1 Project Management for PMP		1d	03/08/01	03/08/01	$0.00	$0.00	88d
01-1040	PMP Project Management	1d	03/08/01	03/08/01	$0.00	$0.00	88d
01WIP.1.1.01.1.2 Initial PMP		89d	03/08/01	07/12/01	$0.00	$0.00	0d
01-1090	Change Control Procedures	1d	03/08/01	03/08/01	$0.00	$0.00	3d
01-1160	Corps Approval PMP	84d	03/15/01	07/12/01	$0.00	$0.00	0d
01-1150	Draft PMP	1d	03/14/01	03/14/01	$0.00	$0.00	0d
01-1130	Functional Area Plans	1d	03/12/01	03/12/01	$0.00	$0.00	1d
01-1120	Funding Requirements	1d	03/13/01	03/13/01	$0.00	$0.00	0d
01-1080	Organization Breakdown Structure	1d	03/08/01	03/08/01	$0.00	$0.00	0d
01-1110	Project Cost Estimate	1d	03/12/01	03/12/01	$0.00	$0.00	0d
01-1050	Project Information	1d	03/08/01	03/08/01	$0.00	$0.00	0d
01-1100	Project Schedule Development	1d	03/09/01	03/09/01	$0.00	$0.00	0d
01-1060	Project Scope	1d	03/08/01	03/08/01	$0.00	$0.00	0d
01-1170	SFWMD Approval PMP	84d	03/15/01	07/12/01	$0.00	$0.00	0d
01-1070	Work Breakdown Structure	1d	03/08/01	03/08/01	$0.00	$0.00	0d
01WIP.1.1.01.1.3 PIR PMP Revision		286d	06/15/05	08/07/06	$68,343.00	$0.00	202d
01-2277	LO PIR PMP update Corps	66d	05/03/06	08/07/06	$22,401.00	$0.00	202d
01-2278	LO PIR PMP update SFWMD	66d	05/03/06	08/07/06	$18,240.00	$0.00	202d
01-2034	TCNS PIR update of PMP Corps	44d	06/15/05	08/17/05	$15,618.00	$0.00	0d
01-2033	TCNS PIR update of PMP SFWMD	44d	06/15/05	08/17/05	$12,084.00	$0.00	0d
01WIP.1.1.01.2 PIR		2072d	07/13/01	10/27/09	$4,501,936.01	$0.00	1051d
01WIP.1.1.01.2.1 Project Management		1808d	07/13/01	10/06/08	$1,716,156.00	$0.00	135d
01-1525	Cooperative Agreement w/ USGS (Corps)	66d	07/27/01	10/30/01	$43,320.00	$0.00	447d
01-1527	Cooperative Agreement w/USGS (SFWMD)	66d	07/27/01	10/30/01	$13,680.00	$0.00	447d
01-1190	Gov't Estimate SFWMD	10d	08/14/01	08/28/01	$9,120.00	$0.00	0d

TASK filter: All Activities

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-2052	LO PIR Proj Mgt - Corps	1300d	07/25/03	10/06/08	$296,400.00	$0.00	135d
01-2054	LO PIR Proj Mgt - SFWMD	1300d	07/25/03	10/06/08	$592,800.00	$0.00	135d
01-1520	PMP Update - Assess Phase Contract	44d	05/22/03	07/25/03	$10,032.00	$0.00	0d
01-1513	PMP Update - Assess Phase Corps	44d	05/22/03	07/25/03	$18,981.00	$0.00	0d
01-1516	PMP Update - Assess Phase SFWMD	44d	05/22/03	07/25/03	$15,960.00	$0.00	0d
01-1200	Procurement AE contract	66d	08/28/01	12/05/01	$9,120.00	$0.00	0d
01-1175	Proj Mgt - Watershed Assess - Corps	450d	07/13/01	05/01/03	$85,500.00	$0.00	14d
01-1177	Proj Mgt - Watershed Assess - SFWMD	450d	07/13/01	05/01/03	$205,200.00	$0.00	14d
01-1192	Review Gov't Est Corps	10d	08/14/01	08/28/01	$7,980.00	$0.00	0d
01-1180	Scope of Work AE Contract - Corps	22d	07/13/01	08/14/01	$19,551.00	$0.00	0d
01-1182	Scope of Work AE Contract - SFWMD	22d	07/13/01	08/13/01	$12,312.00	$0.00	0d
01-1535	TCNS PIR Proj Mgt - Corps	550d	07/25/03	10/05/05	$125,400.00	$0.00	208d
01-1537	TCNS PIR Proj Mgt - SFWMD	550d	07/25/03	10/05/05	$250,800.00	$0.00	208d
01WIP.1.1.01.2.2	**Plan Formulation**	2072d	07/13/01	10/27/09	$2,656,504.01	$0.00	1051d
01WIP.1.1.01.2.2.01	**Goals, Objectives, Performance Measures**	508d	07/13/01	07/25/03	$935,332.00	$0.00	2615d
01WIP.1.1.01.2.2.01.01	**Watershed Assessment**	508d	07/13/01	07/25/03	$701,632.00	$0.00	2615d
01-1320	Base flow estimate - pilot tribs	10d	02/21/02	03/07/02	$5,928.00	$0.00	0d
01-1390	Base flow estimates - all tribs	66d	05/06/02	08/08/02	$24,852.00	$0.00	0d
01-1410	Base flow P loads - all Tribs	44d	08/08/02	10/10/02	$26,448.00	$0.00	0d
01-1440	Bypass estimates - all Tribs	66d	10/10/02	01/21/03	$28,842.00	$0.00	0d
01-1360	Bypass flow estimates - pilot tribs	10d	03/21/02	04/04/02	$6,840.00	$0.00	0d
01-1450	Data Model Development	44d	12/05/01	02/08/02	$30,096.00	$0.00	236d
01-1460	Data Model scenario runs	22d	01/21/03	02/21/03	$14,592.00	$0.00	0d
01-1230	Describe WQ & flow monitoring system	22d	12/05/01	01/08/02	$11,400.00	$0.00	0d
01-1300	Determine base flow @ structures	10d	01/23/02	02/06/02	$5,928.00	$0.00	0d
01-1480	Draft Assessment Report	22d	02/21/03	03/25/03	$13,680.00	$0.00	0d
01-1700	Existing level of flood protection	44d	01/08/02	03/13/02	$20,064.00	$0.00	236d
01-1510	Final Assessment Report	44d	05/22/03	07/25/03	$41,040.00	$0.00	2615d
01-1290	Identify Pilot Tributaries	10d	01/08/02	01/23/02	$4,560.00	$0.00	0d
01-1500	Independent Tech Review - Assessment Rpt	10d	05/08/03	05/22/03	$30,400.00	$0.00	0d
01-1220	Land use & soil data	22d	12/05/01	01/08/02	$11,856.00	$0.00	0d
01-1240	Lit review - sedimentation/other info	22d	12/05/01	01/08/02	$11,856.00	$0.00	0d
01-1340	P load estimates - base flow - pilot tribs	10d	03/07/02	03/21/02	$9,120.00	$0.00	0d
01-1350	P load estimates - storm flow - pilot tribs	10d	03/07/02	03/21/02	$6,840.00	$0.00	0d
01-1270	P Settling Rate	22d	12/05/01	01/08/02	$11,856.00	$0.00	50d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-1490	PDT review - Draft Assess Rpt Corps	22d	03/25/03	04/24/03	$20,520.00	$0.00	0d
01-1485	PDT review - Draft Assess Rpt SFWMD	22d	03/25/03	04/24/03	$9,576.00	$0.00	0d
01-1470	PIR Work Plan	44d	01/21/03	03/25/03	$40,584.00	$0.00	0d
01-1173	Planning Tech Lead - Watershed Assess	450d	07/13/01	05/01/03	$85,500.00	$0.00	14d
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10d	04/24/03	05/08/03	$10,032.00	$0.00	0d
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10d	04/24/03	05/08/03	$4,560.00	$0.00	0d
01-1492	Public Workshop - Draft Assess Rpt Corps	10d	04/24/03	05/08/03	$6,384.00	$0.00	0d
01-1250	Rainfall frequency analysis	22d	12/05/01	01/08/02	$11,856.00	$0.00	30d
01-1178	RECOVER - Watershed Assess - PDT participation	450d	07/13/01	05/01/03	$20,520.00	$0.00	14d
01-1310	Select analytical method Contractor	10d	02/06/02	02/21/02	$6,840.00	$0.00	0d
01-1305	Select analytical method Corps	10d	02/06/02	02/21/02	$11,400.00	$0.00	0d
01-1302	Select analytical method SFWMD	10d	02/06/02	02/21/02	$1,824.00	$0.00	0d
01-1430	Storage needs - all Tribs	66d	10/10/02	01/21/03	$28,842.00	$0.00	0d
01-1370	Storage needs - pilot tribs	10d	03/21/02	04/04/02	$5,586.00	$0.00	0d
01-1330	Storm runoff computations - pilot tribs	10d	02/21/02	03/07/02	$8,208.00	$0.00	0d
01-1400	Storm runoff estimates - all tribs	66d	05/06/02	08/08/02	$24,852.00	$0.00	0d
01-1420	Storm runoff P loads - all Tribs	44d	08/08/02	10/10/02	$19,779.00	$0.00	0d
01-1373	Tech review - pilot trib analysis Corps	22d	04/04/02	05/06/02	$7,296.00	$0.00	0d
01-1376	Tech review - pilot trib analysis SFWMD	22d	04/04/02	05/06/02	$2,280.00	$0.00	0d
01-1380	Technical review - pilot tribs analysis	22d	04/04/02	05/06/02	$5,016.00	$0.00	0d
01-1280	Tributary basin boundary delineation	90d	12/05/01	04/16/02	$39,159.00	$0.00	14d
01-1218	Water Quality Design Criteria - Corps	66d	12/05/01	03/13/02	$4,560.00	$0.00	6d
01-1208	Water Quality Design Criteria Contract	66d	12/05/01	03/13/02	$4,560.00	$0.00	6d
01-1210	Water Quality Design Criteria SFWMD	66d	12/05/01	03/13/02	$5,700.00	$0.00	6d
01WIP.1.1.01.2.2.01.02	**Performance Measures**	154d	12/05/01	07/17/02	$233,700.00	$0.00	148d
01-1271	Draft Performance Measure Corps	44d	12/05/01	02/08/02	$55,632.00	$0.00	148d
01-1272	Draft Performance Measures Contractor	44d	12/05/01	02/08/02	$46,284.00	$0.00	148d
01-1273	Draft Performance Measures SFWMD	44d	12/05/01	02/08/02	$22,344.00	$0.00	148d
01-1279	Finalize Performance Measures	44d	05/14/02	07/17/02	$36,480.00	$0.00	148d
01-1281	In Progress Review - Scoping	22d	05/14/02	06/14/02	$15,048.00	$0.00	170d
01-1275	PDT Performance Measure Review Corps	44d	02/08/02	04/12/02	$25,080.00	$0.00	148d
01-1274	PDT Performance Measure Review SFWMD	40d	02/08/02	04/08/02	$9,120.00	$0.00	152d
01-1277	Perf Measure/Scoping Public Mtg Corps	22d	04/12/02	05/14/02	$10,488.00	$0.00	148d
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22d	04/12/02	05/14/02	$7,296.00	$0.00	148d
01-1276	Perf Measure/Scoping Public Workshop	22d	04/12/02	05/14/02	$5,928.00	$0.00	148d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01WIP.1.1.01.2.2.02	**Future Conditions**	44d	12/05/01	02/08/02	$10,032.00	$0.00	8d
01-1260	Future land use projections	44d	12/05/01	02/08/02	$10,032.00	$0.00	8d
01WIP.1.1.01.2.2.03	**Alternative Plan Formulation**	252d	07/25/03	07/28/04	$717,915.01	$0.00	180d
01WIP.1.1.01.2.2.03.01	**Alt Plan Formulation - Taylor Cr/Nubbin Sl**	164d	07/25/03	03/24/04	$245,157.01	$0.00	0d
01-1805	Alt Form Briefing - TCNS	10d	02/06/04	02/23/04	$6,840.01	$0.00	0d
01-1790	Alternative Descriptions - TCNS	22d	12/03/03	01/06/04	$28,728.00	$0.00	0d
01-1810	Final Alternative Plan Document - TCNS	22d	02/23/04	03/24/04	$16,872.00	$0.00	0d
01-1780	Final Alternative Plans - TCNS	22d	10/29/03	12/03/03	$41,496.00	$0.00	0d
01-1767	Inital Alternative Plans - TCNS SFWMD	44d	07/25/03	09/26/03	$4,560.00	$0.00	0d
01-1770	Initial Alternative Plans - TCNS Contractor	44d	07/25/03	09/26/03	$22,800.00	$0.00	0d
01-1763	Initial Alternative Plans - TCNS Corps	44d	07/25/03	09/26/03	$47,766.00	$0.00	0d
01-1800	PDT Alt Plan Comments - TCNS Corps	22d	01/06/04	02/06/04	$19,551.00	$0.00	0d
01-1795	PDT Alt Plan comments - TCNS SFWMD	22d	01/06/04	02/06/04	$9,120.00	$0.00	0d
01-1772	Plan formulation - economics input - TCNS	44d	07/25/03	09/26/03	$11,400.00	$0.00	0d
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22d	09/26/03	10/29/03	$11,400.00	$0.00	0d
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22d	09/26/03	10/29/03	$8,208.00	$0.00	0d
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWMD	22d	09/26/03	10/29/03	$5,016.00	$0.00	0d
01-1771	Real estate data collection - TCNS	22d	07/25/03	08/26/03	$11,400.00	$0.00	44d
01WIP.1.1.01.2.2.03.02	**Alt Plan Formulation - Lake O PIR**	252d	07/25/03	07/28/04	$472,758.01	$0.00	180d
01-2085	Alt Form Briefing - LO	10d	06/11/04	06/25/04	$6,840.01	$0.00	180d
01-2070	Alt Plan Descriptions - LO	66d	02/06/04	05/11/04	$80,712.00	$0.00	180d
01-2090	Final Alt Plan Document - LO	22d	06/25/04	07/28/04	$28,272.00	$0.00	180d
01-2060	Final Alt Plans - LO	44d	12/03/03	02/06/04	$82,308.00	$0.00	180d
01-2040	Initial Alternative Plans - LO Contractor	66d	07/25/03	10/29/03	$58,368.00	$0.00	180d
01-2037	Initial Alternative Plans - LO Corps	66d	07/25/03	10/29/03	$65,322.00	$0.00	180d
01-2038	Initial Alternative Plans - LO SFWMD	66d	07/25/03	10/29/03	$15,960.00	$0.00	180d
01-2080	PDT Review Alt Plans - LO Corps	22d	05/11/04	06/11/04	$46,512.00	$0.00	180d
01-2075	PDT Review Alt Plans - LO SFWMD	22d	05/11/04	06/11/04	$9,120.00	$0.00	180d
01-2039	Plan formulation - economics input - LO	44d	07/25/03	09/26/03	$14,592.00	$0.00	202d
01-2050	Public Workshop - Alt Plans - LO Contractor	22d	10/29/03	12/03/03	$35,112.00	$0.00	180d
01-2043	Public Workshop - Alt Plans - LO Corps	22d	10/29/03	12/03/03	$10,488.00	$0.00	180d
01-2046	Public Workshop - Alt Plans - LO SFWMD	22d	10/29/03	12/03/03	$6,384.00	$0.00	180d
01-2051	Real estate data collection - LO	22d	07/25/03	08/26/03	$12,768.00	$0.00	246d
01WIP.1.1.01.2.2.05	**Recommended Plan**	1564d	07/25/03	10/27/09	$993,225.00	$0.00	135d
01WIP.1.1.01.2.2.05.01	**Recommended Plan - Taylor Cr/Nubbin Sl**	780d	07/25/03	09/07/06	$421,515.00	$0.00	154d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-2035	Congressional Committee Approval - TCNS	176d	12/27/05	09/07/06	$2,280.00	$0.00	154d
01-1960	Draft Report - TCNS	22d	01/07/05	02/09/05	$9,120.00	$0.00	0d
01-2003	Final Draft Report TCNS Corps	44d	06/15/05	08/17/05	$48,222.00	$0.00	0d
01-2006	Final Draft Report TCNS SFWMD	44d	06/15/05	08/17/05	$6,042.00	$0.00	0d
01-1980	PDT Comparison Alt Plans - TCNS Corps	22d	02/09/05	03/14/05	$16,473.00	$0.00	66d
01-1975	PDT Comparison Alt Plans - TCNS SFWMD	22d	02/09/05	03/14/05	$4,560.00	$0.00	66d
01-1963	PDT Review Draft Report - TCNS Corps	22d	02/09/05	03/14/05	$34,257.00	$0.00	0d
01-1966	PDT Review Draft Report - TCNS SFWMD	22d	02/09/05	03/14/05	$6,840.00	$0.00	0d
01-1538	Pln Tech Lead - TCNS	550d	07/25/03	10/05/05	$125,400.00	$0.00	208d
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22d	02/09/05	03/14/05	$17,328.00	$0.00	66d
01-1993	Pub Wkshp - Draft Report TCNS Corps	22d	02/09/05	03/14/05	$8,664.00	$0.00	66d
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22d	02/09/05	03/14/05	$4,560.00	$0.00	66d
01-2013	Pub Wkshp - Final Report - TCNS Corps	22d	08/17/05	09/19/05	$11,400.00	$0.00	176d
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22d	08/17/05	09/19/05	$4,560.00	$0.00	176d
01-2010	Public Review - Final Report - TCNS	44d	08/17/05	10/20/05	$6,384.00	$0.00	154d
01-1970	Public Review DEIS - TCNS	66d	03/14/05	06/15/05	$11,400.00	$0.00	0d
01-1522	RECOVER - TC/NS Participation	330d	07/25/03	11/18/04	$21,489.00	$0.00	32d
01-1961	RECOVER review Draft Report - TCNS	22d	02/09/05	03/14/05	$45,600.00	$0.00	66d
01-2023	ROD - TCNS Corps	44d	10/20/05	12/27/05	$9,405.00	$0.00	154d
01-2030	ROD - TCNS SFWMD	44d	10/20/05	12/27/05	$1,539.00	$0.00	154d
01-1968	TCNS Final Deliverable Draft Report	22d	02/09/05	03/14/05	$25,992.00	$0.00	0d
01WIP.1.1.01.2.2.05.02	**Recommended Plan - Lake O PIR**	1564d	07/25/03	10/27/09	$571,710.00	$0.00	135d
01-2340	Congressional Authorization - LO	264d	10/06/08	10/27/09	$4,560.00	$0.00	135d
01-2240	Draft PIR/EIS - LO	22d	08/17/05	09/19/05	$14,820.00	$0.00	180d
01-2248	Final Deliverable Draft PIR/EIS - LO	44d	09/19/05	11/22/05	$32,832.00	$0.00	180d
01-2273	Final Draft PIR/EIS - LO Corps	44d	03/02/06	05/03/06	$37,791.00	$0.00	180d
01-2276	Final Draft PIR/EIS - LO SFWMD	44d	03/02/06	05/03/06	$7,695.00	$0.00	180d
01-2243	PDT Review Draft PIR/EIS - LO Corps	44d	09/19/05	11/22/05	$21,603.00	$0.00	180d
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44d	09/19/05	11/22/05	$9,120.00	$0.00	180d
01-2055	Plan Tech Lead - LO PIR	1300d	07/25/03	10/06/08	$296,400.00	$0.00	135d
01-2250	Public Review Draft PIR/EIS - LO	66d	11/22/05	03/02/06	$13,680.00	$0.00	180d
01-2290	Public Review Final PIR/EIS	44d	05/03/06	07/06/06	$11,400.00	$0.00	180d
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22d	11/22/05	12/27/05	$14,592.00	$0.00	224d
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22d	11/22/05	12/27/05	$5,472.00	$0.00	224d
01-2302	Public Workshop - Final PIR/EIS - LO Corps	22d	05/03/06	06/05/06	$9,576.00	$0.00	202d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-2301	Public Workshop - Final PIR/EIS - LO SFWMD	22d	05/03/06	06/05/06	$7,296.00	$0.00	202d
01-2036	RECOVER - LO PIR participation	500d	07/25/03	07/26/05	$47,481.00	$0.00	196d
01-2241	RECOVER Review Draft PIR/EIS - LO	22d	09/19/05	10/20/05	$28,500.00	$0.00	202d
01-2310	ROD - LO Corps	44d	07/06/06	09/07/06	$7,980.00	$0.00	180d
01-2303	ROD - LO SFWMD	44d	07/06/06	09/07/06	$912.00	$0.00	180d
01WIP.1.1.01.2.3	**Environmental Evaluation Appendix**	176d	08/27/04	05/13/05	$44,460.00	$0.00	180d
01WIP.1.1.01.2.3.01	**Enviro Evaluation Appendix - TC/NS PIR**	22d	08/27/04	09/29/04	$10,032.00	$0.00	0d
01-1920	Environmental Eval Appendix - TCNS	22d	08/27/04	09/29/04	$10,032.00	$0.00	0d
01WIP.1.1.01.2.3.02	**Enviro Evaluation Appendix - Lake O**	22d	04/13/05	05/13/05	$34,428.00	$0.00	180d
01-2200	Evironmental Evaluation App - LO	22d	04/13/05	05/13/05	$34,428.00	$0.00	180d
01WIP.1.1.01.2.4	**Socio-Economic Appendix**	176d	08/27/04	05/13/05	$37,392.00	$0.00	180d
01WIP.1.1.01.2.4.01	**Socio-Eco App - Taylor Cr/Nubbin Sl**	22d	08/27/04	09/29/04	$15,048.00	$0.00	0d
01-1940	Socio-Economic Appendix - TCNS	22d	08/27/04	09/29/04	$15,048.00	$0.00	0d
01WIP.1.1.01.2.4.02	**Socio-Eco App - Lake O PIR**	22d	04/13/05	05/13/05	$22,344.00	$0.00	180d
01-2220	Socio-Economic Evaluation Appendix - LO	22d	04/13/05	05/13/05	$22,344.00	$0.00	180d
01WIP.1.1.01.2.5	**Engineering & Design Appendix**	176d	07/28/04	04/13/05	$29,640.00	$0.00	202d
01WIP.1.1.01.2.5.01	**E&D App - Taylor Cr/Nubbin Sl**	22d	07/28/04	08/27/04	$10,032.00	$0.00	22d
01-1930	Eng & Design Appendix - TCNS	22d	07/28/04	08/27/04	$10,032.00	$0.00	22d
01WIP.1.1.01.2.5.02	**E&D App - Lake O PIR**	22d	03/14/05	04/13/05	$19,608.00	$0.00	202d
01-2210	Eng & Design Appendix - LO	22d	03/14/05	04/13/05	$19,608.00	$0.00	202d
01WIP.1.1.01.2.6	**Real Estate Appendix**	176d	08/27/04	05/13/05	$17,784.00	$0.00	180d
01WIP.1.1.01.2.6.01	**RE Appendix - Taylor Cr/Nubbin Sl PIR**	22d	08/27/04	09/29/04	$7,296.00	$0.00	0d
01-1950	Real Estate Appendix - TCNS	22d	08/27/04	09/29/04	$7,296.00	$0.00	0d
01WIP.1.1.01.2.6.02	**RE Appendix - Lake O PIR**	22d	04/13/05	05/13/05	$10,488.00	$0.00	180d
01-2230	Real Estate Evaluation Appendix - LO	22d	04/13/05	05/13/05	$10,488.00	$0.00	180d
01WIP.1.1.01.04	**Alt Plan Evaluation**	516d	07/25/03	08/17/05	$6,299,514.36	$2,800,000.00	312d
01WIP.1.1.01.04.01	**Alt Plan Evaluation - TCNS**	362d	07/25/03	01/07/05	$2,168,957.36	$600,000.00	352d
01-1820	Alt Plan Conceptual Design - TCNS	44d	03/24/04	05/25/04	$21,603.00	$0.00	22d
01-1830	Alt Plan Cost Estimates - TCNS	44d	05/25/04	07/28/04	$21,603.00	$0.00	22d
01-1959	Cultural Resources Initial Assessment - TCNS	120d	03/24/04	09/13/04	$360,468.00	$0.00	78d
01-1880	Draft Alt Plan Evaluation Document - TCNS	22d	08/27/04	09/29/04	$36,024.00	$0.00	0d
01-1957	Draft Fish & Wildlife Coord Act Report - TCNS	98d	03/24/04	08/11/04	$508,440.00	$0.00	100d
01-1958	Draft water control plan - TCNS	22d	05/25/04	06/25/04	$11,400.00	$0.00	66d
01-1956	Endangered Species Consultation - TCNS	65d	03/24/04	06/24/04	$0.00	$0.00	485d
01-1870	Environmental Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	$124,488.00	$0.00	0d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-1910	Final Evaluation Document - TCNS	22d	12/06/04	01/07/05	$31,008.00	$0.00	0d
01-1962	Final FWS - CAR - TCNS	80d	08/11/04	12/08/04	$9,244.36	$0.00	130d
01-1762	Geotech Data Collection - TCNS	132d	07/25/03	02/06/04	$209,120.00	$200,000.00	32d
01-1840	H&H Evaluation of Alternative Plans - TCNS	44d	03/24/04	05/25/04	$25,992.00	$0.00	0d
01-1900	Independent Tech Review - Evaluation Doc - TCNS	22d	11/01/04	12/06/04	$30,400.00	$0.00	0d
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corps	22d	09/29/04	11/01/04	$46,854.00	$0.00	0d
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFWMD	22d	09/29/04	11/01/04	$11,400.00	$0.00	0d
01-1860	Real Estate Cost Est Alt Plans - TCNS	66d	05/25/04	08/27/04	$40,128.00	$0.00	0d
01-1850	Socio-Economic Evaluation Alt Plans - TCNS	66d	05/25/04	08/27/04	$266,193.00	$0.00	0d
01-1761	Topo Data Collection - TCNS	132d	07/25/03	02/06/04	$414,592.00	$400,000.00	32d
01WIP.1.1.01.04.02	**Alt Plan Evaluation - Lake O PIR**	516d	07/25/03	08/17/05	$4,130,557.00	$2,200,000.00	312d
01-2100	Alt Plan Conceptual Design - LO	88d	07/28/04	12/06/04	$88,464.00	$0.00	202d
01-2110	Alt Plans Cost Estimates - LO	66d	12/06/04	03/14/05	$36,936.00	$0.00	202d
01-2091	Cultural Resources Initial Assessment - LO	120d	07/28/04	01/24/05	$360,126.00	$0.00	324d
01-2160	Draft Alt Plan Evaluation Document - LO	22d	04/13/05	05/13/05	$57,684.00	$0.00	180d
01-2234	Draft Fish & Wildlife Coord Act Report - LO PIR	220d	07/28/04	06/15/05	$604,770.00	$0.00	224d
01-2237	Draft water control plan - LO	44d	12/06/04	02/09/05	$22,800.00	$0.00	224d
01-2233	Endangered Species Consultation - LO	64d	07/28/04	10/28/04	$0.00	$0.00	380d
01-2150	Environmental Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	$79,344.00	$0.00	180d
01-2190	Final Alt Plan Evaluation Report - LO	22d	07/18/05	08/17/05	$64,752.00	$0.00	180d
01-2236	Final FWS - CAR - LO	10d	06/15/05	06/29/05	$151,050.00	$0.00	346d
01-2042	Geotech Data collection - LO	132d	07/25/03	02/06/04	$1,012,312.00	$1,000,000.00	300d
01-2120	H&H Evaluation of Alt Plans - LO	88d	07/28/04	12/06/04	$63,612.00	$0.00	180d
01-2180	ITR Alt Plan Evaluation - LO	22d	06/15/05	07/18/05	$7,600.00	$0.00	180d
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22d	05/13/05	06/15/05	$28,785.00	$0.00	180d
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWMD	22d	05/13/05	06/15/05	$6,840.00	$0.00	180d
01-2140	Real Estate Cost Alt Plans - LO	88d	12/06/04	04/13/05	$41,040.00	$0.00	180d
01-2130	Socio-Economic Evaluation Alt Plans - LO	88d	12/06/04	04/13/05	$294,410.00	$0.00	180d
01-2041	Topo Data collection - LO	132d	07/25/03	02/06/04	$1,210,032.00	$1,200,000.00	300d
01WIP.1.1.01.4	**DDR**	719d	08/17/05	07/03/08	$4,556,000.00	$4,556,000.00	180d
01-2330	DDR - LO	455d	09/07/06	07/03/08	$3,024,000.00	$3,024,000.00	180d
01-2320	DDR - TCNS	242d	08/17/05	08/07/06	$1,532,000.00	$1,532,000.00	0d
01WIP.1.1.01.5	**Plans & Specs**	827d	08/07/06	11/30/09	$1,519,000.00	$1,519,000.00	180d
01-2380	Plans & Specs - LO	350d	07/03/08	11/30/09	$1,008,000.00	$1,008,000.00	180d
01-2370	Plans & Specs - TCNS	242d	08/07/06	07/26/07	$511,000.00	$511,000.00	0d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01WIP.1.1.01.6	**PCA**	850d	09/07/06	02/04/10	$0.00	$0.00	135d
01WIP.1.1.01.6.1	**PCA - Taylor Cr/Nubbin Sl RASTA**	66d	09/07/06	12/14/06	$0.00	$0.00	154d
01-2390	PCA - TCNS	66d	09/07/06	12/14/06	$0.00	$0.00	154d
01WIP.1.1.01.6.2	**PCA - Lake O Project**	66d	10/27/09	02/04/10	$0.00	$0.00	135d
01-2400	PCA - LO	66d	10/27/09	02/04/10	$0.00	$0.00	135d
01WIP.1.1.01.7	**Real Estate**	777d	08/07/06	09/15/09	$234,768,000.00	$234,768,000.00	230d
01-2360	Real Estate Acquisition - LO	300d	07/03/08	09/15/09	$205,068,000.00	$205,068,000.00	230d
01-2350	Real Estate Acquisition - TCNS	150d	08/07/06	03/16/07	$29,700,000.00	$29,700,000.00	92d
01WIP.1.1.01.8	**Construction**	1480d	07/26/07	06/27/13	$186,285,056.64	$186,285,056.64	135d
01-2410	Construction - TCNS	482d	07/26/07	06/30/09*	$62,325,240.00	$62,325,240.00	0d
01-2420	Constructon - LO	850d	02/04/10	06/27/13	$123,959,816.64	$123,959,816.64	135d
01WIP.1.1.01.B	**Monitoring**	3123d	07/13/01	01/14/14	$17,858,878.00	$2,177,200.00	0d
01WIP.1.1.01.B.1	**Project Management**	2600d	10/31/01	03/30/12	$1,286,832.00	$0.00	447d
01-1534	Monitoring Design/Imp Coordination Corps	2600d	10/31/01	03/30/12	$52,440.00	$0.00	447d
01-1532	Monitoring Design/Imp Coordination	2600d	10/31/01	03/29/12	$1,207,032.00	$0.00	447d
01-1573	Monitoring Network Design Approval - Corps	44d	04/12/02	06/13/02	$15,960.00	$0.00	0d
01-1574	Monitoring Network Design Approval - SFWMD	44d	04/12/02	06/13/02	$11,400.00	$0.00	0d
01WIP.1.1.01.B.2	**Network Design**	186d	07/13/01	04/11/02	$235,020.00	$0.00	0d
01-1570	Cost estimate for network	22d	02/08/02	03/12/02	$15,048.00	$0.00	0d
01-1530	Define monitoring objectives Corps	10d	07/13/01	07/26/01	$11,400.00	$0.00	0d
01-1528	Define monitoring objectives SFWMD	10d	07/13/01	07/26/01	$3,420.00	$0.00	0d
01-1529	Define monitoring objectives USGS	10d	07/13/01	07/26/01	$3,420.00	$0.00	0d
01-1540	Identify potential monitoring sites	66d	07/27/01	10/30/01	$107,340.00	$0.00	0d
01-1560	Monitoring site design	22d	01/08/02	02/07/02	$10,032.00	$0.00	0d
01-1531	RECOVER - Monitoring Design participation	100d	07/27/01	12/20/01	$5,700.00	$0.00	32d
01-1572	RECOVER Monitoring Plan Review	22d	03/13/02	04/11/02	$22,800.00	$0.00	0d
01-1550	Site & parameter selection	44d	10/31/01	01/07/02	$55,860.00	$0.00	0d
01WIP.1.1.01.B.3	**Implement Network**	2893d	06/14/02	01/14/14	$8,150,387.00	$1,077,200.00	0d
01-1670	Auto-sampler servicing	2640d	06/19/03	01/13/14	$1,026,000.00	$0.00	0d
01-1610	Construction of monitoring sites	132d	10/21/02	05/01/03	$334,234.00	$40,000.00	0d
01-1710	Data collection ET	2640d	06/19/03	01/14/14	$296,400.00	$0.00	0d
01-1720	Data processing - stream flow	2640d	06/19/03	01/14/14	$1,037,400.00	$0.00	0d
01-1660	Discharge measurements/WQ sonde maintenance	2640d	06/19/03	01/13/14	$3,688,320.00	$76,800.00	0d
01-1630	Monitoring Network Ops - establish schedules	10d	06/14/02	06/27/02	$23,200.00	$400.00	243d
01-1650	Monitoring site maintenance & repair	2640d	06/19/03	01/14/14	$600,200.00	$110,000.00	0d

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Activity ID	Activity Name	Original Duration	Start	Finish	Budgeted Total Cost	Budgeted Expense Cost	Total Float
01-1577	Obtain Real Estate for Gages Corps	88d	06/14/02	10/18/02	$2,280.00	$0.00	0d
01-1575	Obtain Real Estate for Gages SFWMD	88d	06/14/02	10/18/02	$22,800.00	$0.00	0d
01-1580	Obtain real estate USGS	88d	06/14/02	10/18/02	$10,260.00	$0.00	132d
01-1640	Operations Plans & Quality Assurance	88d	06/14/02	10/18/02	$205,640.00	$5,000.00	165d
01-1620	Post-construction tasks	33d	05/02/03	06/18/03	$34,029.00	$0.00	0d
01-1590	Purchase equipment	88d	06/14/02	10/18/02	$750,064.00	$730,000.00	0d
01-1600	Purchase supplies & materials	44d	06/14/02	08/15/02	$119,560.00	$115,000.00	44d
01WIP.1.1.01.B.4	**Data Collection**	2640d	06/19/03	01/14/14	$7,559,639.00	$1,100,000.00	0d
01-1730	Processing continuous WQ data	2640d	06/19/03	01/13/14	$598,500.00	$0.00	0d
01-1760	Provide data	2640d	06/19/03	01/13/14	$2,407,680.00	$0.00	0d
01-1750	Review lab results	2640d	06/19/03	01/14/14	$107,673.00	$0.00	0d
01-1690	Sediment sampling	2640d	06/19/03	01/13/14	$738,606.00	$0.00	0d
01-1740	Shipment of samples to laboratory	2640d	06/19/03	01/13/14	$199,500.00	$0.00	0d
01-1680	Water Quality Sampling	2640d	06/19/03	01/13/14	$3,507,680.00	$1,100,000.00	0d
01WIP.1.1.01.B.5	**System Maintenence**	0d			$0.00	$0.00	0d
01WIP.1.1.01.B.6	**Data Management**	0d			$0.00	$0.00	0d
01WIP.1.1.01.B.7	**Data Interpretation**	2640d	06/19/03	01/14/14	$627,000.00	$0.00	0d
01-1755	Data Interpretation and reporting	2640d	06/19/03	01/14/14	$627,000.00	$0.00	0d

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TAB B of Appendix E– Fully Funded Cost Estimate

This section is reserved for documents that will be developed and made available at a later date.

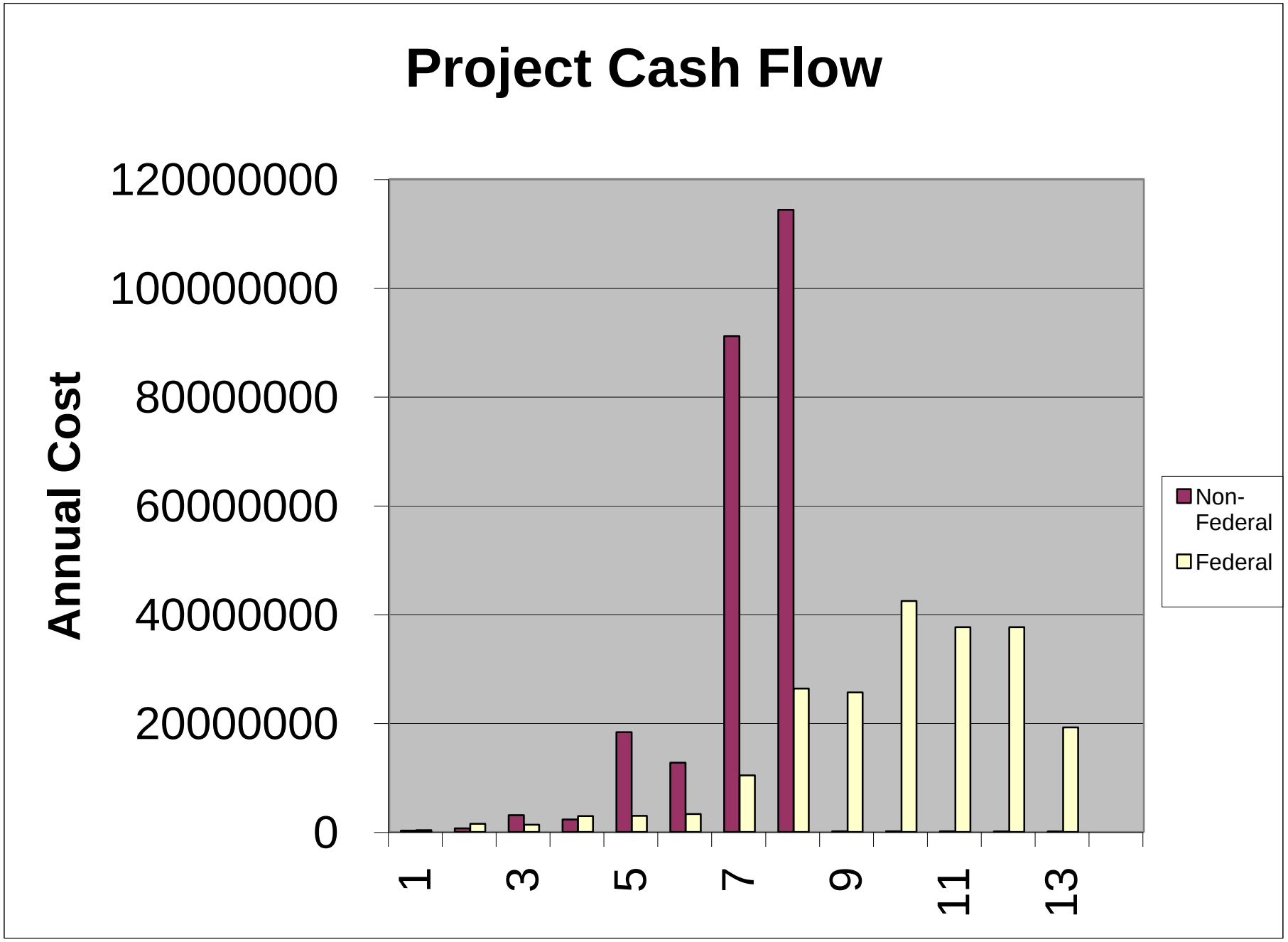
TAB C of Appendix E- Contingency Summary and Status

This section is reserved for documents that will be developed and made available at a later date.

TAB D of Appendix E - Project Cash Flow Chart

FY	2001	2002	2003	2004	2005	2006	2007
Non Federal Cost	238,325	663,005	3,078,470	2,316,394	18,354,043	12,759,020	91,139,979
Federal Cost	322,574	1,509,555	1,346,864	2,940,432	2,970,418	3,285,692	10,415,034
Total	$ 560,899	$ 2,172,560	$ 4,425,334	$ 5,256,826	$ 21,324,461	$ 16,044,712	$ 101,555,013

FY	2008	2009	2010	2011	2012	2013	2014
Non Federal Cost	114,372,604	121,043	120,559	121,043	54,018	32,386	1,036
Federal Cost	26,369,329	25,641,485	42,439,226	37,658,660	37,634,130	19,210,505	740,899
Total	$ 140,741,933	$ 25,762,528	$ 42,559,785	$ 37,779,703	$ 37,688,148	$ 19,242,891	$ 741,935



Appendix E, Tab D

PROJECTED ANNUAL BUDGET

TAB E of Appendix E

	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Contract	**5772812**	**99944**	**351733**	**2734792**	**1894084**	**683139**	**9120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Biologist	94838	20064	1368	33744	3524	31578	4560								
Cost Estimator	89091	3730	830	4352	39176	41004									
Cultural Resource	350436				344581	5855									
Design Engineer	180348	933	4767	47502	105795	21351									
Ecologist	120954	933	7275	18238	41078	53430									
Economist	592629	5036	11836	29412	326144	220201									
Geographer	10032	4103	5929												
GIS Technician	289218	9695	86480	42333	106095	44615									
H&H Engineer	153672		14592	30671	77793	30616									
Hydro Modelor	277647	17560	149671	23320	61827	25269									
Hydrologist	53751	20139	19932	9120	4560										
Planner	236312	2798	11338	66136	94484	59276	2280								
Project Mgr	187919	1554	13038	72344	64792	36190									
Public Relations	21888		1368	11400		6840	2280								
Real Estate	139422	466	674	26592	65511	46179									
Sociologist	53124	1865	7255	4560	14166	25278									
Technician	48800				29074	19726									
Water Quality	72732	11070	15378	24337	6215	15732									
Topo Data - LO	1200000			981742	218258										
Geotech Data - LO	1000000			818119	181881										
Topo Data - TCNS	400000			327247	72753										
Geotech Data - TCNS	200000			163624	36376										
SFWMD Labor	**2831112**	**138381**	**311272**	**343678**	**422310**	**448204**	**272600**	**235043**	**209539**	**121043**	**120559**	**121043**	**54018**	**32386**	**1036**
Counsel	3420	2591	829												
Economist	60068	4103	12313	13224	10364	16701	3363								
Engineering Design	11400			2280		3021	6099								
Modelor	75012	12703	17621	15504	9120	16701	3363								
Monitoring	1265400	18591	94532	104922	120079	120079	119598	120079	120559	120079	119598	120079	53783	32386	1036
Operations	36252	933	4995	6840	6840	10545	6099								
Permits	12141	1243	3317			3021	4560								
Procurement	14820	14820													
Project Manager	1083855	77748	115368	141352	228000	203095	116280	114000	88012						
Public Outreach	25764		1824	9120	2280	6363	6177								
Real Estate	71696	154	29693	15557	6768	7406	7060	965	969	965	961	965	235		
Independent Tech Revie	75240		13680	24320	19760	17480									

PROJECTED ANNUAL BUDGET

Contract	**5772812**	**99944**	**351733**	**2734792**	**1894084**	**683139**	**9120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RECOVER	96045	5495	17100	10559	19099	43793									
US Fish & Wildlife Ser	**1273504**	**0**	**0**	**0**	**809051**	**464454**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Biologist	1273504				809051	464454									
USGS	**16430686**	**154941**	**1287421**	**1004025**	**1399412**	**1399412**	**1393814**	**1399412**	**1405008**	**1399412**	**1393814**	**1399412**	**1378694**	**1372008**	**43906**
Evapo-Trans Specialist	33060		14929	18131											
GIS	10032			10032											
Hydrologist	1952478	85843	124584	102410	168392	168392	167719	168392	169066	168392	167719	168392	147675	140989	4512
Procurement	12312		12312												
Student Assistant	15000	15000													
Technician	7343652		134028	510205	668071	668071	665399	668071	670744	668071	665399	668071	668071	668071	21379
WQ Data Retrieval/Anal	4454094	1140	40128	222313	417881	417881	416210	417881	419553	417881	416210	417881	417881	417881	13372
WQ Network Design	432858	52958	96496	50652	23210	23210	23117	23210	23303	23210	23117	23210	23210	23210	743
Equipment Purchase	730000		730000												
Supplies & Materials	115000		115000												
Travel	40000		14545	25455											
Travel	400		400												
Publishing	5000		5000												
Maintenance	110000			5542	10417	10417	10375	10417	10458	10417	10375	10417	10417	10417	333
Travel	76800			3869	7273	7273	7244	7273	7302	7273	7244	7273	7273	7273	233
WQ Sampling	1100000			55417	104167	104167	103750	104167	104583	104167	103750	104167	104167	104167	3333
Corps Labor	**2420557**	**167633**	**222134**	**342839**	**731969**	**514740**	**205193**	**119474**	**94510**	**9032**	**5452**	**5474**	**1662**	**432**	**14**
Biologist	143345	13574	15417	34340	18940	37340	12237	2192	2201	2192	2184	2192	535		
Cost Estimator	37905	936	3624	4560	6840	12825	9120								
Cultural Resource	370158				333974	36184									
Design Engineer	87029	4959	1368	23541	27977	22344	6840								
Economist	69872	8206	16874	13224	10364	14820	6384								
Geotech Engineer	108585	34463	1587	14668	18373	26452	8856	651	654	651	648	651	485	432	14
Hydrology/Hydraulics	189743	27223	29128	38900	27021	41706	14268	2192	2201	2192	2184	2192	535		
Planning Tech Lead	600200	26765	60103	79796	124364	134045	74121	57000	44006						
Procurement	4560	4560													
Project Manager	541956	39824	48868	71588	114000	102198	59912	57000	45008	3558					
Public Outreach	20748		2280	8208		6363	3897								
Real Estate	37781	70	6366	8646	6242	6879	7277	438	440	438	437	438	107		
Water Quality	37392	1558	5738	10488	5016	12312	2280								
Independent Tech Rev	75240		13680	24320	19760	17480									

PROJECTED ANNUAL BUDGET

Contract	**5772812**	**99944**	**351733**	**2734792**	**1894084**	**683139**	**9120**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RECOVER	96045	5495	17100	10559	19099	43793									

Summary of PIR and Monitoring Costs

Total SFWMD Costs	**8603924**	**238325**	**663005**	**3078470**	**2316394**	**1131343**	**281720**	**235043**	**209539**	**121043**	**120559**	**121043**	**54018**	**32386**	**1036**
Contract	5772812	99944	351733	2734792	1894084	683139	9120								
Labor	2831112	138381	311272	343678	422310	448204	272600	235043	209539	121043	120559	121043	54018	32386	1036
Total Corps Costs	**20124747**	**322574**	**1509555**	**1346864**	**2940432**	**2378606**	**1599007**	**1518886**	**1499518**	**1408444**	**1399266**	**1404886**	**1380356**	**1372440**	**43913**
US Fish & Wildlife Serv	1273504				809051	464454									
USGS	16430686	154941	1287421	1004025	1399412	1399412	1393814	1399412	1405008	1399412	1393814	1399412	1378694	1372008	
Labor	2420557	167633	222134	342839	731969	514740	205193	119474	94510	9032	5452	5474	1662	432	

Summary of Real Estate, Design, and Construction Costs

Real Estate	**234768000**	**0**	**0**	**0**	**0**	**17222700**	**12477300**	**90904936**	**114163065**	**0**	**0**	**0**	**0**	**0**	**0**
LO								90904936	114163065						
TCNS						17222700	12477300								
Design	**6075000**	**0**	**0**	**0**	**0**	**591812**	**1686685**	**2004173**	**1167333**	**624996**	**0**	**0**	**0**	**0**	**0**
DDR - TCNS	1532000					591812	940188								
Plans & Specs TCNS	511000						168365	342635							
DDR - LO	3024000						578132	1661538	784329						
Plans & Specs - LO	1008000								383004	624996					
Construction	**186285057**	**0**	**0**	**0**	**0**	**0**	**0**	**6891975**	**23702478**	**23608045**	**41039960**	**36253774**	**36253774**	**17838065**	**696986**
TCNS	62325240							6891975	23702478	23608045	8122742				
LO	123959817										32917219	36253774	36253774	18535049	

TOTAL PROJECT COSTS

Total Project Costs	**455856728**	**560899**	**2172560**	**4425334**	**5256826**	**21324461**	**16044712**	**101555013**	**140741933**	**25762528**	**42559785**	**37779703**	**37688148**	**19242891**	**741935**

Summary of Work-In-Kind Services

Total Project Cost Allocation Summary

SFWMD PIR Labor	$2,831,112
SFWMD Contract	$5,772,812
Real Estate	$234,768,000
Total SFWMD Cost *	**$243,371,924**
Corps PIR Labor	$2,420,557
USGS	$16,430,686
USFWS	$1,273,504
Design	$6,075,000
Construction	$186,285,057
Total Federal Cost *	**$212,484,804**
Total Project Cost	**$455,856,728**
50% Total Project Cost	**$227,928,364**
Total Federal Share	**47%**
Total SFWMD Share	**53%**

*** The projected costs are not equal to a 50/50 share.**
Current project estimate reflects an in-kind-credit for SFWMD of $15,443,560 to be carried over between authorized projects as provided for under Section 601 (e)(5)(C) of the Water Resources Development Acto of 2000.

Appendix G: Performance Measurement

This section is reserved for documents that will be developed and made available at a later date.

Appendix H: Real Estate Plan

The primary objective of the real estate plan is to identify lands that can help facilitate implementation of the Lake Okeechobee Watershed Project. The secondary objective is to identify lands that can facilitate the planned full-scale implementation of the LOWP.

The estimated land requirement is approximately 35,000 acres.

The PIR will attempt to identify publicly and privately owned lands deemed suitable for the project. The use of eminent domain proceedings is not anticipated.

All real estate tasks identified in Work Breakdown Structure will be conducted by the real estate professionals. According to the Design Agreement (executed May 12, 2000), SFWMD will take the lead role in providing resources and funds to acquire lands to facilitate CERP projects. The real estate activities in support of this project will be guided by the Real Estate Program Requirement outlined the *Master Program Management Plan*.

Real Estate	**234915060**	**0**	**21764**	**22240**	**47424**	**55632**	**12870000**	**16830000**	**89546360**	**115521640**	**0**	**0**	**0**	**0**
Contractor														
GIS Technician	31692				12312	19380								
Planner	2280					2280								
Project Manager	6840					6840								
Real Estate	82308			20064	35112	27132								
Contractor Total	**123120**	**0**	**0**	**20064**	**47424**	**55632**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
USGS														
WQ Network Specialist	10260		9327	933										
USGS Total	**10260**	**0**	**9327**	**933**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Real Estate	2280		2073	207										
Corps Total	**2280**	**0**	**2073**	**207**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Real Estate	11400		10364	1036										
Lake O Real Estate	205068000								89546360	115521640				
TCNS Real Estate	29700000						12870000	16830000						
SFWMD Total	**234779400**	**0**	**10364**	**1036**	**0**	**0**	**12870000**	**16830000**	**89546360**	**115521640**	**0**	**0**	**0**	**0**

Real Estate (By Resource)

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1860	Real Estate Cost Est Alt Plans - TCNS	66	5/25/04	8/27/04	0	$10,032
01-1950	Real Estate Appendix - TCNS	22	8/27/04	9/29/04	0	$2,280
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$17,100
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$228

Summary for ' Contractor - GIS Tech (4 detail records)

Sum for Resource ***$29,640***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$2,280

Summary for ' Contractor - Planner (1 detail record)

Sum for Resource ***$2,280***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$228

Summary for ' Contractor - Project Mgr (2 detail records)

Sum for Resource ***$4,788***

Contractor - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1771	Real estate data collection - TCNS	22	7/25/03	8/26/03	44	$10,032
01-1860	Real Estate Cost Est Alt Plans - TCNS	66	5/25/04	8/27/04	0	$30,096
01-1950	Real Estate Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-2051	Real estate data collection - LO	22	7/25/03	8/26/03	246	$10,032
01-2140	Real Estate Cost Alt Plans - LO	88	12/6/04	4/13/05	180	$17,100
01-2230	Real Estate Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$10,032

Summary for ' Contractor - Real Estate (6 detail records)

Sum for Resource ***$82,308***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1577	Obtain Real Estate for Gages Corps	88	6/14/02	10/18/02	0	$2,280

Summary for ' Corps - Real Estate (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1575	Obtain Real Estate for Gages SFWMD	88	6/14/02	10/18/02	0	$22,800
01-1771	Real estate data collection - TCNS	22	7/25/03	8/26/03	44	$1,368
01-2051	Real estate data collection - LO	22	7/25/03	8/26/03	246	$2,736

Summary for ' SFWMD - Real Estate (3 detail records)

Sum for Resource ***$26,904***

USGS WQ Network Design

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1580	Obtain real estate USGS	88	6/14/02	10/18/02	132	$10,260

Summary for ' USGS WQ Network Design (1 detail record)

Sum for Resource ***$10,260***

Summary for = Real Estate (18 detail records)

Sum for Category ***$158,460***

Real Estate (By Expense)

LO - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2360	LO - Real Estate	300	7/3/08	9/15/09	230	$205,068,000

Summary for ' LO - Real Estate (1 detail record)

Sum for Resource ***$205,068,000***

TCNS Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2350	TCNS Real Estate	150	8/7/06	3/16/07	92	$29,700,000

Summary for ' TCNS Real Estate (1 detail record)

Sum for Resource ***$29,700,000***

Summary for = Real Estate (2 detail records)

Sum for Category ***$234,768,000***

Grand Total ***$432,105,257***

Appendix I: Acquisition Plan

Purpose

The purpose of the acquisition plan is to identify equipment, materials, construction services, professional services, etc. that will be procured from outside sources to assist in project implementation. Emphasis is placed on identifying tasks that can be conducted in a more cost-effective, economical, and timely manner than if conducted internally by SFWMD or USACE.

Implementation

A scope of work, cost estimate, and timeframe will be established for each item, with the item description contained in the Project Management Plan used as a guideline. For each item identified for procurement, a team, consisting of all those who will be responsible for significant aspects of the acquisition (i.e., contracting, fiscal, legal, and technical personnel from USACE and SFWMD), will be formed. This planning must integrate the efforts of all personnel responsible for significant aspects of the acquisition.

The agency responsible for each task (lead agency) will also take the lead on procurement of those supplies/services. According to the Design Agreement (May 12, 2000) between USACE and SFWMD, one member of the agency (SFWMD or USACE) not conducting the procurement may participate on the selection committee.

The USACE Contracting Process. Contracting for the Federal Share of the projects is governed by the Federal Acquisition Regulation (FAR). This is a uniform set of regulations for all government projects. FAR part 36 addresses Construction and Architect Engineer Services. The FAR has been supplemented by DOD (DFARS), the Army (AFARS), and the USACE (EFARS).

Design services are procured by Architect-Engineer Contracting procedures prescribed at FAR subpart 36.6 and Construction Contracts are governed by FAR at subparts 36.1, 36.2, and 36.3. Architect-Engineer selections are based upon qualifications. Once selected, rates for the various engineering specialties are negotiated and an indefinite-delivery, indefinite-quantity contract is issued. Tasks against these contracts are issued for the various design services. These are called Task Orders. These are negotiated with the A-E based upon the government's estimate of the number of man-hours of the various specialties required to perform the work. Steps for each Task Order are described in the succeeding paragraphs and Table 1.

Table 1. Architect Engineer Contracting Process

1 Develop A-E Scope of Services
2 Prepare Advertisement for Commerce Business Daily
3 Advertisement Period
4 A-Es prepare resumes of qualifications in response to the advertisement and submits.
5 A-E Source Selection Board Meets and reviews the resumes
6 A-E is selected by the Board based upon qualifications
7 Price negotiation
8 A-E contract issued
9 Task Order scoped and cost estimate prepared
10 A-E receives Task Order and prepares a cost estimate
11 Task Order negotiated.
12 Task Order issued.

Construction Contracts undergo an advertisement and bidding process as outlined in **Table 2**. Contract documents comprising a scope of work, drawings, and detailed specifications are advertised in the Commerce Business Daily for a specified period. Contractors submit sealed bids. These sealed bids are opened in a public process and the low bidder is typically selected. (Note: Some projects are solicited via requests for proposals, in which case there is no public bid opening. Contractor selection is based on price and non-price factors).

Table 2. Construction Contraction Process

1. Contracting Documents prepared
2. Biddability, Constructability, Operability (BCO) Conferences Conducted.
3. Government Estimate Prepared
4. Advertisement
5. Receive Bids
6. Open Bids
7. Review Bids
8. Pre-award review of qualifications
9. Award
10. Notice to Proceed.

The SFWMD Contracting Process. Contracts administered through the SFWMD must comply with State of Florida and Federal contracting guidelines. Contracts administered through USACE must only comply with Federal contracting guidelines. Methods of procurement typically employed by SFWMD include:

1. Request for Proposals (RFPs) – predominantly for professional services in compliance with the State of Florida's Competitive Consultant Negotiation Act (CCNA)
2. Request For Bids (RFBs) for general and specialty contractors, and
3. Purchase Orders (POs) for vendor services of less than $25,000

The Competition in Contracting Act, as implemented in FAR Part 7, requires agencies to perform acquisition planning and conduct market surveys in order to promote and provide for full and open competition. The USACE also has a mandate to outsource a minimum of 40% of their project design cost to architect-engineer firms.

Contracting	**55404**	**49463**	**5941**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Engineer-Design	2280	2280												
Engineer-Geotech	2052	2052												
Hydrology & Hydraulics	5928	5928												
Project Manager	14592	14592												
Corps Total	**24852**	**24852**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Counsel	2280	795	1485											
Project Manager	18012	15784	2228											
Procurement	10260	8032	2228											
SFWMD Total	**30552**	**24611**	**5941**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Contracting (By Resource)

Corps - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$4,959

Summary for ' Corps - Design Engineer (1 detail record)

Sum for Resource ***$4,959***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$2,052

Summary for ' Corps - Geotech Engineer (1 detail record)

Sum for Resource ***$2,052***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$4,560
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$1,368

Summary for ' Corps - Hydrology/Hydraulics (2 detail records)

Sum for Resource ***$5,928***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1180	Scope of Work AE Contract - Corps	22	7/13/01	8/14/01	0	$10,032
01-1192	Review Gov't Est Corps	10	8/14/01	8/28/01	0	$4,560

Summary for ' Corps - Project Manager (2 detail records)

Sum for Resource ***$14,592***

SFWMD - Counsel

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$2,280

Summary for ' SFWMD - Counsel (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Procurement

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1182	Scope of Work AE Contract - SFWMD	22	7/13/01	8/13/01	0	$2,280
01-1190	Gov't Estimate SFWMD	10	8/14/01	8/28/01	0	$4,560
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$3,420

Summary for ' SFWMD - Procurement (3 detail records)

Sum for Resource ***$10,260***

SFWMD - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1182	Scope of Work AE Contract - SFWMD	22	7/13/01	8/13/01	0	$10,032
01-1190	Gov't Estimate SFWMD	10	8/14/01	8/28/01	0	$4,560
01-1200	Procurement AE contract	66	8/28/01	12/5/01	0	$3,420

Summary for ' SFWMD - Project Manager (3 detail records)

Sum for Resource ***$18,012***

Summary for = Contracting (13 detail records)

Sum for Category ***$58,083***

Appendix J: Quality Control Plan

A Contractor will perform the majority of the technical analyses for this project. A three-tiered quality control process is planned. The Contractor will perform the first tier of the Quality Control process. A Quality Assurance plan will be required in each contract proposal and will be one of the criteria used to select a contractor. The selected contractor will be required to adhere to the Quality Assurance plan throughout the contract duration.

The Project Delivery Team will perform the second tier of Quality Control. The PDT will perform this role by providing guidance to the Contractor prior to, and during the preparation of all deliverables. The PDT will then review the scope, level of detail, technical adequacy, and adherence to Federal and state requirements for each Contractor deliverable.

The third tier of the Quality Control process will be performed through Independent Technical Reviews of critical project deliverables as described below in Tab A of this Appendix.

In-Progress Reviews (IPR) and/or Issue Resolution Conferences (IRC) will be held with USACE higher authority, the SFWMD, and the ITR to coordinate key findings during the project implementation process. Two required IPRs will include a Feasibility Scoping Meeting (FSM), to be held concurrent with finalizing performance measures, and an Alternative Formulation Briefing (AFB), to follow final plan evaluation. Unscheduled reviews or conferences may also occur, if the need arises. See attached guide from ER 1105-2-100. Schedules are shown on the WBS (Appendix C Tab A).

g. Feasibility Report

(1) Content:

(a) Feasibility phase procedures and study results shall be documented in a feasibility report. Report requirements are generally the same regardless of whether or not Federal action is recommended. The following requirements are generally applicable to all reports. Requirements for NEPA are in Appendix C.

(b) The report will present the recommended plan and, if applicable, the degree of and rationale for departure from the NED Plan, the NER Plan, or the Combined NED/NER Plan and the sponsor's preference, if none of these are the recommended plan. Should the District Commander find that the NED Plan, the NER Plan or the Combined NED/NER Plan or a justifiable departure is not acceptable to the sponsor, a locally preferred plan may be considered for Federal participation. If there is no acceptable plan, the study should be terminated and guidance obtained from CECW-P.

Exhibit G-3 Instructions for Conducting Issue Resolution Conferences/In-Progress Reviews for Feasibility and Postauthorization Studies and Reports

Purpose. This exhibit describes procedures and requirements for convening Issue Resolution Conferences/ In-Progress Reviews (IRCs/ IPRs) for implementing Washington level review of feasibility and post authorization studies and reports generally covered in ER 1105-2-100. Specifically discussed are conduct of the Feasibility Scoping Meeting (FSM) and the Alternative Formulation Briefing (AFB).

Background:

Issue Resolution Conferences (IRCs) and In-Progress Reviews (IPRs) - The primary objective of an IRC is to discuss and resolve policy issues to ensure the study progresses in an orderly manner and that preparation of a final report is not delayed. IRCs and IPRs can be held at any point in time during the study process to provide an update of study findings and progress, identify potential problems (technical/policy), and document decisions. The FSM and the AFB are two examples of IPRs. An IRC/IPR other than the FSM

and AFB specified above may be held at the request of the District or Division whenever issues have been identified that require resolution in order for the study to proceed efficiently. The District should strongly encourage the non-Federal sponsor to participate in all IRCs/IPRs.

Feasibility Scoping Meeting. To ensure that feasibility and general reevaluation studies are focused and tailored to meet specific objectives, a FSM will be convened early in the feasibility study. The FSM will bring the Headquarters, Division and District staffs, the non-Federal sponsor, and resource agencies together to focus the feasibility study on key alternatives, to further define the depth of analysis required and to refine study/project constraints. Accordingly, the PMP developed during the reconnaissance phase may require revision to document changes agreed to at the FSM. The revised PMP will then form the basis for subsequent conduct and review of the feasibility report.

Alternative Formulation Briefing. The alternative review process was established to save time and costs in the preparation and review of feasibility and general reevaluation reports, and to facilitate HQUSACE participation in plan formulation. The AFB will be scheduled when the District has identified a selected plan and is prepared to present the formulation and evaluation of alternatives. The Washington level participants will seek to confirm that the plan formulation and selection process, the identified preferred plan, and definition of Federal and non-Federal responsibilities, conform to current policy guidance. The goal is to identify and resolve any policy concerns that would otherwise delay or preclude approval of the draft report, and to allow the District to release the draft report to the public concurrent with the policy compliance review of the report. If identified, policy concerns are sufficiently resolved at the AFB. The AFB Guidance Memorandum will instruct the District to submit the draft report for Washington level policy compliance review concurrent with public release of the draft EIS/EA. This will allow the District to save the time required for sequential policy compliance and public reviews, including potential revision/review iterations frequently needed to achieve an acceptable report. Timing of the IRCs/IPRs. When an IRC/IPR is to be scheduled, CECW-P should be contacted to discuss a range of proposed dates for holding the conference. CECW-P will confirm the acceptability of the final date with other Washington level offices. The following criteria will be met:

Feasibility Scoping Meeting. The District should convene a FSM soon after the NEPA scoping process and the preliminary plan formulation and evaluation has been accomplished and the District is prepared to focus and tailor the feasibility study on key alternatives, to further define the depth of analysis required and to refine study/project constraints. Alternative

Formulation Briefing. An AFB should be convened when the District is prepared to present the results of the alternative formulation, evaluation and comparison process and has identified a selected plan. Specific items for discussion at the AFB are the complete array of alternatives, cost estimates, benefit analyses, and mitigation and real estate requirements and costs.

Technical Review. For all of the above IRCs/IPRs the District should have completed and documented technical review appropriate to the current level of the study. To the extent possible, technical issues should be resolved prior to the IRCs/IPRs.

Pre-conference Activities. The District will submit pre-conference material 35 days prior to the conference date. See Appendix H for instructions and number of copies. The transmittal memorandum will identify and discuss any policy issues requiring resolution and/or significant or potential issues that the Division/District believes could affect the outcome of the project. Copies of previous guidance memoranda, the compliance guidance memorandum, the latest PMP and the technical review documentation should be enclosed. Districts and divisions are encouraged to use electronic mail for the transmittal of conference materials (i.e., policy compliance memorandums, responses to comments, etc.). Due to current system limitations, transmittal of draft and final reports by electronic mail is not recommended.

Feasibility Scoping Meeting. Pre-conference materials should include, as a minimum, a description of existing conditions and assumptions for without project conditions, results of initial public involvement, a discussion of problems and opportunities, identification of specific planning objectives and constraints, a description of applicable management measures and preliminary plans and the evaluation of preliminary plans.

Alternative Formulation Briefing. Pre-conference material should include pertinent information such as key assumptions, base conditions, without project condition, alternative plans, economic and cost data, environmental considerations, etc. The pre-conference documentation will address the general evaluation guidelines presented in Exhibit G-1. Exhibit. G-4 is a checklist of items that will be included, as a minimum, in the pre-conference material. The pre-conference material should also document how concerns identified in the reconnaissance guidance memorandum and PMP were addressed. The District should submit documentation of technical review to the Washington level with the pre-conference materials.

Although technical review will not have been completed, a status report discussing significant technical review concerns and how these concerns will

be resolved must be provided as part of the AFB pre-conference material. If the draft report is available, that report will serve as pre-conference documentation. CECW-P will provide the Division with any Washington level review comments within 35 calendar days after receipt of the pre-conference documentation at HQUSACE. The AFB will be held after receipt of HQUSACE comments.

Conduct of the IRCs/IPRs.

a. The IRCs/IPRs will be chaired by the Division. In order to identify and resolve as early as possible any impediments to efficient delivery of the project, the IRCs should be structured to encourage the surfacing and discussion of concerns, and development of consensus on resolution of issues.

b. The sponsor and appropriate Federal and State agencies should be encouraged to participate fully in all discussions.

c. The District participants in the IRCs should be prepared to address the policy issues raised by Washington level review.

d. Discussions and required actions will be recorded and will be the basis of the draft guidance memorandum developed at the conference.

e. A project site visit should be part of the AFB, unless there are extenuating circumstances. The project site visit should be supplemented with a general overview of the tentatively selected plan and study area at the start of the field trip. If a site visit is not practical, slides and/or a video shall be presented.

Post Conference Documentation. CECW-P will be responsible for finalizing the guidance memorandum drafted at the IRCs/IPRs. The final guidance memorandum for revising the PMP or preparation of the draft or final report will be transmitted to the Division Office within 14 calendar days of the IRC/IPR.. The guidance memorandum will be used to revise the PMP to incorporate the changes agreed to at the meetings. The revised PMP, as a result of the FSM or other IRCs/IPRs, will be followed during the conduct of the feasibility study and will be a primary tool for the review of subsequent products (AFB pre-conference documentation, draft or final report). The guidance memorandum describing the issues discussed at the AFB and their resolution will be used by the District to complete all required detailed analyses and prepare the draft feasibility report/NEPA document. The District will be responsible for ensuring that concerns identified in the AFB guidance memorandum are addressed in the draft report. Subject to CECW-P approval stated in the AFB guidance memorandum, the draft feasibility

report/NEPA document will be distributed for the required 45-day public review concurrent with transmittal of the draft report and a compliance guidance memorandum to HQUSACE for Washington-level review.

Quality Control (By Resource)

Contractor - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$20,064
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Biologist (5 detail records)

Sum for Resource ***$27,692***

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$1,140

Summary for ' Contractor - Cost Estimator (1 detail record)

Sum for Resource ***$1,140***

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Design Engineer (1 detail record)

Sum for Resource ***$5,016***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - GIS Tech (2 detail records)

Sum for Resource ***$7,296***

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - H&H Engineer (2 detail records)

Sum for Resource ***$7,296***

Contractor - Hydro Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280

01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Hydro Modelor (2 detail records)

Sum for Resource ***$7,296***

Contractor - Planner

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$10,032

Summary for ' Contractor - Planner (4 detail records)

Sum for Resource ***$12,644***

Contractor - Project Mgr

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622

Summary for ' Contractor - Project Mgr (4 detail records)

Sum for Resource ***$4,892***

Contractor - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$1,140
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Real Estate (2 detail records)

Sum for Resource ***$6,156***

Contractor - Sociologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$2,280

Summary for ' Contractor - Sociologist (1 detail record)

Sum for Resource ***$2,280***

Contractor - Water Quality

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$1,140
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Water Quality (2 detail records)

Sum for Resource ***$6,156***

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140

Summary for ' Corps - Biologist (9 detail records)

Sum for Resource ***$14,240***

Corps - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140

Summary for ' Corps - Cost Estimator (4 detail records)

Sum for Resource ***$7,980***

Corps - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$4,959
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$15,504
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$627

Summary for ' Corps - Design Engineer (6 detail records)

Sum for Resource ***$23,702***

Corps - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280

01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140

Summary for ' Corps - Economist (8 detail records)

Sum for Resource ***$11,960***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$1,368
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$2,280
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$4,560
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,280

Summary for ' Corps - Geotech Engineer (4 detail records)

Sum for Resource ***$10,488***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$4,104
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1305	Select analytical method Corps	10	2/6/02	2/21/02	0	$2,280
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$4,560
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$5,130
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$4,560
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,736

Summary for ' Corps - Hydrology/Hydraulics (10 detail records)

Sum for Resource ***$28,262***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$2,280
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$4,560
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$2,280

Summary for ' Corps - Planning Tech Lead (8 detail records)

Sum for Resource ***$15,380***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368

Summary for ' Corps - Project Manager (1 detail record)

Sum for Resource ***$1,368***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$2,280
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$1,140

Summary for ' Corps - Real Estate (5 detail records)

Sum for Resource ***$6,032***

Corps - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$1,368
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$1,368
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$1,368
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$1,368

Summary for ' Corps - Water Quality (4 detail records)

Sum for Resource ***$5,472***

Independent Tech Review

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1275	PDT Performance Measure Review Corps	44	2/8/02	4/12/02	148	$9,120
01-1305	Select analytical method Corps	10	2/6/02	2/21/02	0	$9,120
01-1470	PIR Work Plan	44	1/21/03	3/25/03	0	$9,120
01-1490	PDT review - Draft Assess Rpt Corps	22	3/25/03	4/24/03	0	$9,120
01-1500	Independent Tech Review - Assessment Rp	10	5/8/03	5/22/03	0	$30,400
01-1573	Monitoring Network Design Approval - Corp	44	4/12/02	6/13/02	0	$9,120
01-1900	Independent Tech Review - Evaluation Doc	22	11/1/04	12/6/04	0	$30,400
01-1963	PDT Review Draft Report - TCNS Corps	22	2/9/05	3/14/05	0	$9,120
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$9,120
01-2160	Draft Alt Plan Evaluation Document - LO	22	4/13/05	5/13/05	180	$9,120
01-2180	ITR Alt Plan Evaluation - LO	22	6/15/05	7/18/05	180	$7,600
01-2243	PDT Review Draft PIR/EIS - LO Corps	44	9/19/05	11/22/05	180	$9,120

Summary for ' Independent Tech Review (12 detail records)

Sum for Resource ***$150,480***

SFWMD - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622

Summary for ' SFWMD - Economist (3 detail records)

Sum for Resource ***$2,612***

SFWMD - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1281	In Progress Review - Scoping	22	5/14/02	6/14/02	170	$1,368
01-1805	Alt Form Briefing - TCNS	10	2/6/04	2/23/04	0	$622
01-2080	PDT Review Alt Plans - LO Corps	22	5/11/04	6/11/04	180	$2,280
01-2085	Alt Form Briefing - LO	10	6/11/04	6/25/04	180	$622

Summary for ' SFWMD - Real Estate (4 detail records)

Sum for Resource ***$4,892***

Summary for = Quality Control (104 detail records)

Sum for Category ***$370,728***

TAB A of Appendix J– Independent Technical Review

Team Membership

Independent Technical Reviews will be performed at three critical points in this project.

1. Following the Contractor's incorporation of PDT comments on the draft Watershed Assessment document, the ITR team will perform its first review. The review will primarily be focused on the hydrologic modeling and analyses performed in the Watershed Assessment. At the same time, the team will also review the work plan to be developed by the Contractor. The work plan will lay out the scope, schedule, and cost estimate for the technical work required for preparation of the Taylor Creek/Nubbin Slough and Lake Okeechobee PIRs. The ITR team will evaluate the technical adequacy of the proposed process.

2. The ITR team will also review the Evaluation Reports for both PIRs that will be compiled by the contractor – after PDT comments have been incorporated into the drafts. The Evaluation Reports will contain the results of all engineering, socio-economic, environmental, and other evaluations of all alternative plans against all performance measures. This report will provide the basis for selection of the recommended plan. Therefore, it is critical that the technical evaluations of the alternative plans be as technically accurate as possible.

Project Synopsis:

The Quality Control Plan (QCP) presents the policy and specific actions to be implemented on the Lake Okeechobee Watershed Project to ensure that high quality products are produced on time and within budget.

The purpose of this project is to improve water quality to Lake Okeechobee by providing surface water storage, provide peak flow attenuation, and by reducing nutrient loading. To obtain this goal, water will be detained in large storage areas during wet periods for later use during dry periods and be released into stormwater treatment areas (RASTA). This increased storage capacity will reduce the duration and frequency of both high and low water levels in Lake Okeechobee that are stressful to the Lake's littoral ecosystems and cause large discharges from the Lake that are damaging to the downstream estuary ecosystems. In addition, the project will restore the hydrology of isolated wetlands by plugging the connections to drainage ditches and the diversion of canal flows to adjacent wetlands.

The design of the project will include the collection of data, identification of peak flows, and monitoring/sampling of water quality on selected tributaries within the boundaries through a "watershed assessment" of the identified Basins. To accomplish this, sites will be identified and a network of monitoring equipment will be installed.

Two Project Implementation Reports (PIR) will be prepared for the Lake Okeechobee Watershed Project. The first PIR will be for the Taylor Creek and Nubbin Slough sites since it has been authorized as part of WRDA 2000 under the Critical Project Program. A second PIR will be for the remaining elements to be authorized in future WRDAs.

Monitoring will continue after construction of the sites for approximately 10 years. After which, a scale-back plan will be implemented. The scale-back period will be decided later.

The Mission Statement for the Lake Okeechobee Watershed Project is:

"Improve the water quality of Lake Okeechobee to meet federal and state standards, and provide for water levels to improve the habitats within the lake and downstream bodies. Build appropriate storage and treatment facilities to capture and treat surface water discharges into the Lake Okeechobee watershed; remove water from the lake for water quality and water level management; in accordance with the guidelines, regulations and timelines delineated in the Comprehensive Plan."

See Section 2.0 Project Information and Section 3.0 Project Scope of the PMP for additional information.

Production:
The Project Delivery Team with their specialties, including office symbols and telephone numbers is provided in Appendix A of the PMP.

Independent Technical Review Team:
The review team members are/will be senior professionals selected by their technical division chief based on the expertise needed for the design. They will not be affiliated with the development of the design. Their assignment is to confirm the proper application of clearly established criteria, regulations, laws, codes, principles, and professional procedures. The present technical review team members are named below:

Annon Bozeman	Planner	COE (PD-ER)	904-232-1688
Martin Gonzalez	Civil Engineer/Planner	COE (PD-PF)	904-232-1117
Bill Hunt	Economist	COE (PD-D)	904-232-1020

Eng.Div. Tech Unit	Civil, Structural, Geotech, Hydrologist, Cost	COE (EN-T)	904-232-2253
Bruce Tappmeyer	Engineer	COE (CO-CQ)	904-232-3835
Karl Nixon	Review Appraiser	COE (RE-S)	904-232-2339
John Kremer	Biologist	COE (PD-ES),	904-232-3551

Schedule:
See Appendix D of the PMP for a schedule of engineering events, site visits, and key intermediate milestones for development of the overall product. Include the Independent Technical Review Team at appropriate milestones within this schedule. The schedule will be updated periodically to reflect changes and status and be readily available to the team. The Quality Control Plan will be updated when/if significant changes occur on the project.

Architect-Engineer Contracted Products:
(**To be added as more detail is obtained** - If a significant portion of the project is to be completed by an Architect-Engineering firm, then include the following:

- Architect-Engineer's Quality Management Plan
- Architect-Engineer's Organization Chart (with names and positions identified
- List of Architect-Engineer's Project Delivery Team and their agency counterparts
- List of Architect-Engineer's Independent Review Team members)

Plan Objective:
The Plan sets forth the review requirements for the Plans and Specifications (P&S) and other engineering and design documents (E&D) developed by the U.S. Army Corps of Engineers (USACE) and the South Florida Water Management District (SFWMD). There will be an independent technical to review of all P&S and E&D conducted by the SFWMD and USACE to ensure quality control before completion. The technical review will verify the reasonableness of the results, including whether the products meet the needs consistent with law.

Quality Control Manager (QCM) for the Project shall be responsible for the following quality control activities:

1. Maintaining a file of pertinent correspondence and project guidelines.
2. Developing a central location to store in house review sets of plans, design calculations, quality computations, reports, specifications etc.
3. Monitoring and evaluating the design activities of the Design Team and conduct follow up where necessary.
4. Reviewing submittals for completeness and accuracy.

Document activities relating to quality control and route to all affected parties.

Appointment of **Engineering Division Project Engineer** (PE) for the preparation of the P&S is the Engineering Division point of contact with the Project Manager and the coordinator of the technical engineering and design support requirements for the project. His responsibilities are:

1. Ensuring that the customer requirements are fully understood, those clear accurate criterions are established, and that guidance and direction for the designer is fully documented.
2. Coordination of the Engineering Division's work on assigned technical products.
3. Closely monitoring progress of the work and costs for technical products against the project schedules.
4. Advising the PM of the status periodically, and of all significant developments as they arise.

Technical Coordination:
Team members will meet regularly to coordinate technical efforts between the various disciplines, to discuss and work toward resolving outstanding issues, and to examine work progress and expenditures. These meetings will keep team members updated on the status of the project and any significant developments, as well as encourage a team building and partnering spirit that will enhance successful completion of a quality product on schedule and within budget.

Site Visits by Technical Team Members will be taken as necessary.

Project Review Process:
Design team members will provide their input for the plans and specifications to the Engineering Division, Design Branch. When all the information for the plan and specifications has been received, Design Branch, Specifications Section will have the project documents reproduced and disseminated for review by the District and Area Offices.

Review comments and actions will be recorded on SAD Form 3058-R or similar form, and maintained in file folders and/or electronically. Forms submitted during the in-house review of the plans and specifications will be maintained by Specifications Section (CESAJ-EN-DC). The project will be reviewed with respect to biddability, constructibility, operability, and environmental compatibility in accordance with ER 415-1-11.

Biddability, Constructibility, Operability, and Environmental (BCOE) Review Meeting:
After the review period is completed, a review meeting will be convened by Design Branch, Specifications Section to address the project comments. The Design team members will be present at this meeting along with other concerned Construction, Operations, Engineering, and Project Management personnel.

> Design team members shall provide input or make any necessary changes to the contract documents in a timely manner as a result of the BCOE meeting.

Independent Technical Review for USACE and SFWMD E&D Products (ER 1110-2-1150)

All engineering and design products shall have an independent technical review (ITR). The ITR team shall be established when work as started on a product and shall conduct such reviews as necessary to insure that the product is consistent with established criteria, guidance, procedures, and policy. The ITR process shall be a continuous process with reviews coordinated with the PDT to minimize lost design effort.

The ITR team shall document its actions and recommendations; furnishing the PDT reports at critical points during project formulation, design, and construction. Five review options are available to districts for conducting independent technical reviews. The reviews may be conducted within the district, by another district(s), by Centers of Expertise, by USACE teams, or by contract.

A statement of technical and legal review should be completed for all final products and final documents. In the case of decision documents forwarded to HQUSACE for review, a statement of technical and legal review should accompany both draft and final documents. A sample statement of technical and legal review is included in TAB B. The statement shown is a sample and may be modified to include PDT members and IRT team members or to include other functional chiefs or the District Commander. These modifications shall be justified and included in the QCP. When the ITR is preformed by contract, the appropriate members of the contractor's staff shall sign the statement.

In developing an ITR and quality control program, the Districts are encouraged to prepare standard

Guidelines for the independent technical review:

Objectives:
1. To ensure that the engineering concepts are valid,
2. To ensure that the recommended plan is feasible and will be safe and functional,
3. To ensure that a reasonable cost estimate has been developed,
4. To ensure that the engineering analysis is correct,
5. To ensure that it complies with engineering policy requirements, and
6. To ensure that it complies with accepted engineering practice within USACE.

Reviewers must identify any significant deficiency. Comments should be limited to those that are required to ensure adequacy of the product; it is not the reviewer's responsibility to enforce personal preferences.

A secondary review objective is to ensure that the recommended plan is an economical solution.

The following simple checklist should be used as the basis for performing engineering technical reviews:
1. Is the proposed solution safe, functional, constructible, economical, and reasonable?
2. Does the design follow USACE engineering criteria? (If not, have proper waivers been obtained?)
3. Are appropriate analysis methods being used?
4. Are the basic design assumptions valid?
5. Are the calculations initialed by designers and checkers, and are results essentially correct?
6. For the current phase of the project, is the engineering content sufficiently complete, and does it provide an adequate basis for the baseline cost estimate?
7. Is the documentation adequate?

Technical reviewers should not comment on inconsequential items, such as the following:
1. Spelling, grammar, format or language in the report. (This type of comment may be made informally, in parallel with the official technical review process.)
2. Minor numerical errors, which do not affect adequacy of the results.
3. Alternate design solutions or analysis methods, where the designers have already used appropriate methods to develop an adequate solution.
4. Any other issues which will not add value by making the project safe, functional, or more economical.

REVIEW PROCEDURES - The Chief of Engineering should provide written objectives and procedures for use by independent technical review teams. The chief is also responsible for selecting qualified review team members, appointing a team leader, and in cooperation with the project manager providing the time and funding resources necessary for an adequate review. The team leader should discuss with the team their responsibilities and objectives. When the review is completed, the team leader should verify that each comment is appropriate. When comments seem inappropriate, the team leader should discuss them with the reviewer, and should have inappropriate comments withdrawn by the reviewer. The team leader should also eliminate any mutually conflicting comments, and consolidate similar or related comments. The final review comments should be submitted to the design team for resolution.

COMMENT RESOLUTION - Use of the guidelines about should result in a reasonable volume of review comments. Comments do not necessarily have to be complied with, but each comment must be resolved, not ignored. When the designer disagrees with a comment, the best means of resolution is a discussion between designer and reviewer. When this does not result in an appropriate resolution, the issue should be elevated through the designer's chain of command. The review team does not have authority to enforce comments; authority for comment resolution lies in the design chain of command. The Chief of Engineering in the responsible design district is the final authority for resolution of engineering technical review comments. The design team leader and the review team leader should jointly ensure that each comment has been resolved. The final comments, and the resolution of these comments, should be included in the district's project documentation. Significant issues raised by the reviewers, and the resolution of these issues, should be included with the submittal of the decision document.

CERTIFICATION - A certification by Project Manager, the Chief of Engineering and other functional chiefs that the issues raised by the technical review team have been resolved is required. This certification must be included with submittal of decision documents and should be included with the design documentation for subsequent phases of design.

ARCHITECT-ENGINEERS - When engineering work is performed under contract, ITR is still essential components of the process. Frequently, the AE contract includes provisions for providing QC, including ITR. In these cases, the contract should define the scope for proper execution of these requirements.

ITR	**68400**	**0**	**0**	**30400**	**11055**	**26945**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Independent Tech Rev	68400			30400	11055	26945								
ITR Total	68400	0	0	30400	11055	26945	0	0	0	0	0	0	0	0

Independent Technical Review

Independent Tech Review

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1500	Independent Tech Review - Assessment Rp	10	5/8/03	5/22/03	135	$30,400
01-1900	Independent Tech Review - Evaluation Doc	22	10/18/04	11/18/04	921	$30,400
01-2180	ITR Alt Plan Evaluation - LO	22	6/1/05	7/1/05	190	$7,600

Summary for ' Independent Tech Review (3 detail records)

Sum for Resource ***$68,400***

Summary for = Independent Technical Review (3 detail records)

Sum for Category ***$68,400***

TAB B of Appendix J – Statement of Technical and Legal Review

STATEMENT OF TECHNICAL AND LEGAL REVIEW
COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The District has completed the (type of study) of (project name and location). Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions were verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing USACE policy. The independent technical review was accomplished by (an independent district team/personnel from XX District/by A-E contractor).

(Signature) (Date)
Technical Review Team Leader

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW:

Significant concerns and the explanation of the resolution are as follows:
(Describe the major technical concerns, possible impact, and resolution) As noted above, all concerns resulting from independent technical review of the project have been considered. The report and all associated documents required by the National Environmental Policy Act have been fully reviewed.

(Signature) (Date)
Project Manager

(Signature) (Date)
Chief, Planning Division

(Signature) (Date)
Chief, Engineering Division

(Signature) (Date)
Chief, Operations Division

(Signature) (Date)
Chief, Real Estate Division

CERTIFICATION OF LEGAL REVIEW:

The report for, including all associated documents required by the National Environmental Policy Act, has been fully reviewed by the Office of Counsel, District and is approved as legally sufficient.

(Signature) (Date)
District Counsel

Appendix K: Public Involvement

Public Outreach	**98952**	**0**	**0**	**36892**	**62060**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Biologist	2280				2280									
Ecologist	4560				4560									
Economist	2280				2280									
Engineer-Hydraulic	6840			2280	4560									
GIS Technician	2280				2280									
Planner	10944			4519	6425									
Project Manager	13680			2715	10965									
Public Outreach	11400			4975	6425									
Water Quality	2280			2280										
Contractor Total	**56544**	**0**	**0**	**16769**	**39775**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Biologist	2736			808	1928									
Economist	2736			808	1928									
Engineer-Geotech	2736			808	1928									
Hydrology & Hydraulics	4104			2176	1928									
Planning Tech Lead	4104			2176	1928									
Project Manager	2736			2176	560									
Public Outreach	5928			3088	2840									
Real Estate	1368				1368									
Corps Total	**26448**	**0**	**0**	**12040**	**14408**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Economist	2736			808	1928									
Modelor	2736			1368	1368									
Public Outreach	6840			3627	3213									
Project Manager	2280			2280										
Real Estate	1368				1368									

SFWMD Total	**15960**	**0**	**0**	**8083**	**7877**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Public Outreach & Information (By Resource)

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280

Summary for ' Contractor - Design Engineer (1 detail record)

Sum for Resource ***$2,280***

Contractor - Ecologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560

Summary for ' Contractor - Ecologist (1 detail record)

Sum for Resource ***$4,560***

Contractor - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280

Summary for ' Contractor - Economist (1 detail record)

Sum for Resource ***$2,280***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$2,280

Summary for ' Contractor - GIS Tech (1 detail record)

Sum for Resource ***$2,280***

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560

Summary for ' Contractor - H&H Engineer (2 detail records)

Sum for Resource ***$6,840***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$1,824
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$4,560
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560

Summary for ' Contractor - Planner (3 detail records)

Sum for Resource ***$10,944***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$1,368
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$2,280
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$10,032

Summary for ' Contractor - Project Mgr (3 detail records)

Sum for Resource ***$13,680***

Contractor - Public Relations

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280
01-1775	Pub Wkshp - Alt Plan Form - TCNS Cont	22	9/26/03	10/29/03	0	$4,560
01-2050	Public Workshop - Alt Plans - LO Contracto	22	10/29/03	12/3/03	180	$4,560

Summary for ' Contractor - Public Relations (3 detail records)

Sum for Resource ***$11,400***

Contractor - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1495	Pub Wkshp - Draft Assess Rpt Contractor	10	4/24/03	5/8/03	0	$2,280

Summary for ' Contractor - Water Quality (1 detail record)

Sum for Resource ***$2,280***

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368

Summary for ' Corps - Biologist (2 detail records)

Sum for Resource ***$2,736***

Corps - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368

Summary for ' Corps - Economist (2 detail records)

Sum for Resource ***$2,736***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368

Summary for ' Corps - Geotech Engineer (1 detail record)

Sum for Resource ***$1,368***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
Summary for ' Corps - Hydrology/Hydraulics (3 detail records)						
				Sum for Resource		***$4,104***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
Summary for ' Corps - Planning Tech Lead (3 detail records)						
				Sum for Resource		***$4,104***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$1,368
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
Summary for ' Corps - Project Manager (2 detail records)						
				Sum for Resource		***$2,736***

Corps - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1492	Public Workshop - Draft Assess Rpt Corps	10	4/24/03	5/8/03	0	$2,280
01-1773	Pub Wkshp - Alt Plan Form - TCNS Corps	22	9/26/03	10/29/03	0	$1,368
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$2,280
Summary for ' Corps - Public Outreach (3 detail records)						
				Sum for Resource		***$5,928***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2043	Public Workshop - Alt Plans - LO Corps	22	10/29/03	12/3/03	180	$1,368
Summary for ' Corps - Real Estate (1 detail record)						
				Sum for Resource		***$1,368***

SFWMD - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$1,368
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368

Summary for ' SFWMD - Economist (2 detail records)

Sum for Resource ***$2,736***

SFWMD - Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$1,368
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368

Summary for ' SFWMD - Modelor (2 detail records)

Sum for Resource ***$2,736***

SFWMD - Project Manager

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10	4/24/03	5/8/03	0	$2,280

Summary for ' SFWMD - Project Manager (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Public Outreach

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1493	Public Wkshop - Draft Assess Rpt SFWMD	10	4/24/03	5/8/03	0	$2,280
01-1777	Pub Wkshp - Alt Plan Form - TCNS SFWM	22	9/26/03	10/29/03	0	$2,280
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$2,280

Summary for ' SFWMD - Public Outreach (3 detail records)

Sum for Resource ***$6,840***

SFWMD - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2046	Public Workshop - Alt Plans - LO SFWMD	22	10/29/03	12/3/03	180	$1,368

Summary for ' SFWMD - Real Estate (1 detail record)

Sum for Resource ***$1,368***

Summary for = Public Outreach & Information (42 detail records)

Sum for Category ***$97,584***

TAB A of Appendix K– Public Involvement Plan

This section is reserved for documents that will be developed and made available at a later date.

TAB B of Appendix K– Listing of Stakeholders

This section is reserved for documents that will be developed and made available at a later date.

Appendix L: Value Engineering Plan

This section is reserved for documents that will be developed and made available at a later date.

Appendix M: Water Control Plan

Water Control	**34200**	**0**	**0**	**0**	**11400**	**22800**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Engineer-Hydraulic	17100				5700	11400								
Contractor Total	**17100**	**0**	**0**	**0**	**5700**	**11400**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Hydrology & Hydraulics	17100				5700	11400								
Corps Total	**17100**	**0**	**0**	**0**	**5700**	**11400**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Water Control (By Resource)

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1958	Draft water control plan - TCNS	22	5/25/04	6/25/04	66	$5,700
01-2237	Draft water control plan - LO	44	12/6/04	2/9/05	224	$11,400

Summary for ' Contractor - H&H Engineer (2 detail records)

Sum for Resource ***$17,100***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1958	Draft water control plan - TCNS	22	5/25/04	6/25/04	66	$5,700
01-2237	Draft water control plan - LO	44	12/6/04	2/9/05	224	$11,400

Summary for ' Corps - Hydrology/Hydraulics (2 detail records)

Sum for Resource ***$17,100***

Summary for = Water Control (4 detail records)

Sum for Category ***$34,200***

Appendix N: Water Quality Certification Plan

Water Quality	**71364**	**0**	**56772**	**14592**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Geographer	10032		10032											
GIS Technician	12312		10032	2280										
Hydrologic Modelor	20064		10032	10032										
Project Manager	2280		2280											
Water Quality	14592		12312	2280										
Contractor Total	**59280**	**0**	**44688**	**14592**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Planning Tech Lead	2280		2280											
Water Quality	2280		2280											
Corps Total	**4560**	**0**	**4560**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Counsel	1140		1140											
Modelor	1824		1824											
Permits	4560		4560											
SFWMD Total	**7524**	**0**	**7524**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Water Quality (By Resource)

Contractor - Geographer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032

Summary for ' Contractor - Geographer (1 detail record)

Sum for Resource ***$10,032***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$2,280

Summary for ' Contractor - GIS Tech (2 detail records)

Sum for Resource ***$12,312***

Contractor - Hydro Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1450	Data Model Development	44	12/5/01	2/8/02	236	$10,032
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$10,032

Summary for ' Contractor - Hydro Modelor (2 detail records)

Sum for Resource ***$20,064***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1208	Water Quality Design Criteria Contract	66	12/5/01	3/13/02	6	$2,280

Summary for ' Contractor - Project Mgr (1 detail record)

Sum for Resource ***$2,280***

Contractor - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1208	Water Quality Design Criteria Contract	66	12/5/01	3/13/02	6	$2,280
01-1270	P Settling Rate	22	12/5/01	1/8/02	50	$10,032
01-1460	Data Model scenario runs	22	1/21/03	2/21/03	0	$2,280

Summary for ' Contractor - Water Quality (3 detail records)

Sum for Resource ***$14,592***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1218	Water Quality Design Criteria - Corps	66	12/5/01	3/13/02	6	$2,280

Summary for ' Corps - Planning Tech Lead (1 detail record)

Sum for Resource ***$2,280***

Corps - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1218	Water Quality Design Criteria - Corps	66	12/5/01	3/13/02	6	$2,280

Summary for ' Corps - Water Quality (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Counsel

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1210	Water Quality Design Criteria SFWMD	66	12/5/01	3/13/02	6	$1,140

Summary for ' SFWMD - Counsel (1 detail record)

Sum for Resource ***$1,140***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1270	P Settling Rate	22	12/5/01	1/8/02	50	$1,824

Summary for ' SFWMD - Modelor (1 detail record)

Sum for Resource ***$1,824***

SFWMD - Permits

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1210	Water Quality Design Criteria SFWMD	66	12/5/01	3/13/02	6	$4,560

Summary for ' SFWMD - Permits (1 detail record)

Sum for Resource ***$4,560***

Summary for = Water Quality (14 detail records)

Sum for Category ***$71,364***

Grand Total ***$23,751,471***

Appendix O: Operations and Maintenance Plan

This section is reserved for documents that will be developed and made available at a later date.

Appendix P: Environmental and Economic Equity Plan

Socio-Economics	**645875**	**0**	**21888**	**25992**	**281241**	**316754**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Economist	537453		10032	21432	239457	266532								
Hydrologic Modelor	10032		10032											
Planner	5016					5016								
Project Manager	2280					2280								
Real Estate	11286				5016	6270								
Sociologist	29184			4560	12768	11856								
Technician	48800				24000	24800								
Contractor Total	**644051**	**0**	**20064**	**25992**	**281241**	**316754**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Modelor	1824		1824											
SFWMD Total	**1824**	**0**	**1824**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Socio-Economics (By Resource)

Contractor - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1260	Future land use projections	44	12/5/01	2/8/02	8	$10,032
01-1772	Plan formulation - economics input - TCNS	44	7/25/03	9/26/03	0	$11,400
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$229,425
01-1940	Socio-Economic Appendix - TCNS	22	8/27/04	9/29/04	0	$10,032
01-2039	Plan formulation - economics input - LO	44	7/25/03	9/26/03	202	$10,032
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$256,500
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$10,032

Summary for ' Contractor - Economist (7 detail records)

Sum for Resource ***$537,453***

Contractor - Hydro Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1220	Land use & soil data	22	12/5/01	1/8/02	0	$10,032

Summary for ' Contractor - Hydro Modelor (1 detail record)

Sum for Resource ***$10,032***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Planner (1 detail record)

Sum for Resource ***$5,016***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$2,280

Summary for ' Contractor - Project Mgr (1 detail record)

Sum for Resource ***$2,280***

Contractor - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$5,016
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$6,270

Summary for ' Contractor - Real Estate (2 detail records)

Sum for Resource ***$11,286***

Contractor - Sociologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget

01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$7,752
01-1940	Socio-Economic Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-2039	Plan formulation - economics input - LO	44	7/25/03	9/26/03	202	$4,560
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$6,840
01-2220	Socio-Economic Evaluation Appendix - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Sociologist (5 detail records)

Sum for Resource ***$29,184***

Contractor - Technician

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1850	Socio-Economic Evaluation Alt Plans - TCN	66	5/25/04	8/27/04	0	$24,000
01-2130	Socio-Economic Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$24,800

Summary for ' Contractor - Technician (2 detail records)

Sum for Resource ***$48,800***

SFWMD - Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1220	Land use & soil data	22	12/5/01	1/8/02	0	$1,824

Summary for ' SFWMD - Modelor (1 detail record)

Sum for Resource ***$1,824***

Summary for = Socio-Economics (20 detail records)

Sum for Category ***$645,875***

Appendix Q: Restoration Coordination and Verification Integration Plan

RECOVER	**192117**	**5073**	**37563**	**15512**	**41477**	**92492**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RECOVER POC	95217	5073	14763	15512	41477	18392								
RECOVER Team	96900		22800			74100								
RECOVER Total	**192117**	**5073**	**37563**	**15512**	**41477**	**92492**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

RECOVER (By Resource)

RECOVER POC

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1178	RECOVER - Watershed Assess - PDT parti	450	7/13/01	5/1/03	14	$20,520
01-1522	RECOVER - TC/NS Participation	330	7/25/03	11/18/04	32	$21,489
01-1531	RECOVER - Monitoring Design participatio	100	7/27/01	12/20/01	32	$5,700
01-2036	RECOVER - LO PIR participation	500	7/25/03	7/26/05	196	$47,481

Summary for ' RECOVER POC (4 detail records)

Sum for Resource ***$95,190***

RECOVER Team

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1572	RECOVER Monitoring Plan Review	22	3/13/02	4/11/02	0	$22,800
01-1961	RECOVER review Draft Report - TCNS	22	2/9/05	3/14/05	66	$45,600
01-2241	RECOVER Review Draft PIR/EIS - LO	22	9/19/05	10/20/05	202	$28,500

Summary for ' RECOVER Team (3 detail records)

Sum for Resource ***$96,900***

Summary for = RECOVER (7 detail records)

Sum for Category ***$192,090***

Appendix R: Project Cooperation Agreement

Examples of the draft (and final) PCA package will be included after the DDR is approved.

The USACE Project Cooperation Agreement guidance can be found at: www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pcaguide.htm.

TAB A of Appendix R – Project Cooperation Agreement Checklist

The USACE Project Cooperation Agreement Checklist can be found at: www.usace.army.mil/inet/functions/cw/cecwa/branches/review/pdf/pcachk.pdf.

TAB B of Appendix R– Working/Executed Project Cooperation Agreement Document

A model Project Cooperation Agreement can be downloaded from the USACE official website at: www.hq.usace.army.mil/cecc/6008.pdf.

Appendix S: Permitting and Monitoring Plan

Monitoring	**17801868**	**93707**	**1262827**	**1039737**	**1581757**	**1587863**	**1581757**	**1569541**	**1581757**	**1581757**	**1581757**	**1587863**	**1475185**	**1276365**
USGS														
WQ Analytical Analysis	1100000			34167	107917	108333	107917	107083	107917	107917	107917	108333	107917	94583
Equipment	730000		663636	66364										
ET Specialist	33060		4560	28500										
GIS Technician	10032			10032										
Hydrologist	1952478	40004	156988	81492	174455	175128	174455	173107	174455	174455	174455	175128	150339	128018
Procurement	12312		11400	912										
Student Assistant	15000	10227	4773											
Technician	7343639		55632	452314	692121	694793	692121	686776	692121	692121	692121	694793	692121	606608
Travel	117200		400	42385	7535	7564	7535	7476	7535	7535	7535	7564	7535	6604
WQ Data Retrieval	4454097	1140	36480	140713	432925	434597	432925	429582	432925	432925	432925	434597	432925	379436
WQ Network Specialist	422598	20572	92174	72365	24046	24139	24046	23860	24046	24046	24046	24139	24046	21075
Gage Maintenance	110000			3417	10792	10833	10792	10708	10792	10792	10792	10833	10792	9458
Publishing costs	5000		4545	455										
Supplies	115000		115000											
USGS Total	**16420416**	**71943**	**1145588**	**933116**	**1449791**	**1455387**	**1449791**	**1438592**	**1449791**	**1449791**	**1449791**	**1455387**	**1425675**	**1245782**
Corps														
Biologist	29640	4560	4332	2236	2271	2280	2271	2254	2271	2271	2271	2280	342	
Engineer-Geotech	25080	3835	5491	649	1569	1575	1569	1557	1569	1569	1569	1575	1376	1176
Hydrology & Hydraulics	38760	7669	10343	2236	2271	2280	2271	2254	2271	2271	2271	2280	342	
Project Manager	2280	2280												
Real Estate	6840		2690	447	454	456	454	451	454	454	454	456	68	
Corps Total	**102600**	**18344**	**22856**	**5568**	**6565**	**6591**	**6565**	**6516**	**6565**	**6565**	**6565**	**6591**	**2128**	**1176**
SFWMD														
Modelor	3420	1140	2280											

Monitoring Proj Mgr	1260840		88920	100069	124402	124882	124402	123441	124402	124402	124402	124882	47232	29407
Project Manager	2280	2280												
Real Estate	12312		3183	984	999	1003	999	992	999	999	999	1003	150	
SFWMD Total	**1278852**	**3420**	**94383**	**101053**	**125401**	**125885**	**125401**	**124433**	**125401**	**125401**	**125401**	**125885**	**47382**	**29407**

Monitoring (By Resource)

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$4,560
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$22,800

Summary for ' Corps - Biologist (2 detail records)

Sum for Resource ***$27,360***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$2,280
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$2,280
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$4,560

Summary for ' Corps - Geotech Engineer (3 detail records)

Sum for Resource ***$9,120***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$4,560
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$22,800
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$4,560
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$4,560

Summary for ' Corps - Hydrology/Hydraulics (4 detail records)

Sum for Resource ***$36,480***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1530	Define monitoring objectives Corps	10	7/13/01	7/26/01	0	$2,280

Summary for ' Corps - Project Manager (1 detail record)

Sum for Resource ***$2,280***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1534	Monitoring Design/Imp Coordination Corps	2600	10/31/01	3/30/12	447	$4,560

Summary for ' Corps - Real Estate (1 detail record)

Sum for Resource ***$4,560***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1528	Define monitoring objectives SFWMD	10	7/13/01	7/26/01	0	$1,140

01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$2,280
Summary for ' SFWMD - Modelor (2 detail records)						
				Sum for Resource		***$3,420***

SFWMD - Monitoring

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$912,000
01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$6,840
01-1755	Data Interpretation and reporting	2640	6/19/03	1/14/14	0	$342,000
Summary for ' SFWMD - Monitoring (3 detail records)						
				Sum for Resource		***$1,260,840***

SFWMD - Project Manager

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1528	Define monitoring objectives SFWMD	10	7/13/01	7/26/01	0	$2,280
Summary for ' SFWMD - Project Manager (1 detail record)						
				Sum for Resource		***$2,280***

SFWMD - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$10,032
01-1574	Monitoring Network Design Approval - SFW	44	4/12/02	6/13/02	0	$2,280
Summary for ' SFWMD - Real Estate (2 detail records)						
				Sum for Resource		***$12,312***

USGS Evapo-Trans Specialist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$28,500
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
Summary for ' USGS Evapo-Trans Specialist (2 detail records)						
				Sum for Resource		***$33,060***

USGS GIS

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$10,032
Summary for ' USGS GIS (1 detail record)						
				Sum for Resource		***$10,032***

USGS Hydrologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1532	Monitoring Design/Imp Coordination	2600	10/31/01	3/29/12	447	$285,000

01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$25,650
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1755	Data Interpretation and reporting	2640	6/19/03	1/14/14	0	$285,000
01-1760	Provide data	2640	6/19/03	1/13/14	0	$1,203,840

Summary for ' USGS Hydrologist (12 detail records)

Sum for Resource ***$1,952,478***

USGS Procurement

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1590	Purchase equipment	88	6/14/02	10/18/02	0	$10,032
01-1600	Purchase supplies & materials	44	6/14/02	8/15/02	44	$2,280

Summary for ' USGS Procurement (2 detail records)

Sum for Resource ***$12,312***

USGS Student Assistant

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$15,000

Summary for ' USGS Student Assistant (1 detail record)

Sum for Resource ***$15,000***

USGS Technician

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1560	Monitoring site design	22	1/8/02	2/7/02	0	$5,016
01-1560	Monitoring site design	22	1/8/02	2/7/02	0	$5,016
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$60,192
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$48,450
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$10,032
01-1620	Post-construction tasks	33	5/2/03	6/18/03	0	$13,965
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840
01-1660	Discharge measurements/WQ sonde maint	2640	6/19/03	1/13/14	0	$1,203,840

01-1710	Data collection ET	2640	6/19/03	1/14/14	0	$296,400
01-1720	Data processing - stream flow	2640	6/19/03	1/14/14	0	$1,037,400
01-1730	Processing continuous WQ data	2640	6/19/03	1/13/14	0	$598,500
01-1740	Shipment of samples to laboratory	2640	6/19/03	1/13/14	0	$199,500
01-1750	Review lab results	2640	6/19/03	1/14/14	0	$107,673
01-1760	Provide data	2640	6/19/03	1/13/14	0	$1,203,840

Summary for ' USGS Technician (20 detail records)

Sum for Resource ***$7,343,652***

USGS WQ Data Retrieval/Anal

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1650	Monitoring site maintenance & repair	2640	6/19/03	1/14/14	0	$245,100
01-1670	Auto-sampler servicing	2640	6/19/03	1/13/14	0	$1,026,000
01-1680	Water Quality Sampling	2640	6/19/03	1/13/14	0	$1,203,840
01-1680	Water Quality Sampling	2640	6/19/03	1/13/14	0	$1,203,840
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$367,023
01-1690	Sediment sampling	2640	6/19/03	1/13/14	0	$367,023

Summary for ' USGS WQ Data Retrieval/Anal (8 detail records)

Sum for Resource ***$4,454,094***

USGS WQ Network Design

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1529	Define monitoring objectives USGS	10	7/13/01	7/26/01	0	$1,140
01-1540	Identify potential monitoring sites	66	7/27/01	10/30/01	0	$28,500
01-1550	Site & parameter selection	44	10/31/01	1/7/02	0	$25,650
01-1570	Cost estimate for network	22	2/8/02	3/12/02	0	$5,016
01-1590	Purchase equipment	88	6/14/02	10/18/02	0	$10,032
01-1600	Purchase supplies & materials	44	6/14/02	8/15/02	44	$2,280
01-1610	Construction of monitoring sites	132	10/21/02	5/1/03	0	$60,192
01-1630	Monitoring Network Ops - establish schedul	10	6/14/02	6/27/02	243	$4,560
01-1640	Operations Plans & Quality Assurance	88	6/14/02	10/18/02	165	$40,128
01-1650	Monitoring site maintenance & repair	2640	6/19/03	1/14/14	0	$245,100

Summary for ' USGS WQ Network Design (10 detail records)

Sum for Resource ***$422,598***

Summary for = Monitoring (75 detail records)

Sum for Category ***$15,601,878***

Monitoring (By Expense)

Monitor Gage Maint

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1650	Monitor Gage Maint	2640	6/19/03	1/14/14	0	$110,000

Summary for ' Monitor Gage Maint (1 detail record)

Sum for Resource ***$110,000***

Monitoring Equipment

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1590	Monitoring Equipment	88	6/14/02	10/18/02	0	$730,000

Summary for ' Monitoring Equipment (1 detail record)

Sum for Resource ***$730,000***

Publishing

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1640	Publishing	88	6/14/02	10/18/02	165	$5,000

Summary for ' Publishing (1 detail record)

Sum for Resource ***$5,000***

Supplies & Materials

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1600	Supplies & Materials	44	6/14/02	8/15/02	44	$115,000

Summary for ' Supplies & Materials (1 detail record)

Sum for Resource ***$115,000***

Travel

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1610	Travel	132	10/21/02	5/1/03	0	$40,000
01-1630	Travel	10	6/14/02	6/27/02	243	$400
01-1660	Travel	2640	6/19/03	1/13/14	0	$76,800

Summary for ' Travel (3 detail records)

Sum for Resource ***$117,200***

Water Analysis

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1680	Water Analysis	2640	6/19/03	1/13/14	0	$1,100,000

Summary for ' Water Analysis (1 detail record)

Sum for Resource ***$1,100,000***

Summary for = Monitoring (8 detail records)

Sum for Category ***$2,177,200***

Appendix T: Reference Documents and Forms

TAB A of Appendix T– List of Reference Documents

1.0 Documents:

a. U.S. Army Corps of Engineers, Jacksonville District, 1999, Central and Southern Florida Project Comprehensive Review Study, Final Integrated Feasibility Report and Programmatic Environmental Impact Statement; South Florida Water Management District, West Palm Beach, FL, April 1999

b. Master Program Management Plan, Comprehensive Everglades Restoration Plan (CERP), Final, August 2000

c. Project Management Plan for Restoration Coordination and Verification (RECOVER), Draft, February 2001

d. Engineering Regulations (ER), U.S. Army Corps of Engineers

1) ER 5-1-11, U.S. Army Corps of Engineers Business Process, 14 Feb 01
2) ER 405-1-12, Real Estate Handbook, Chapter 12, 20 Nov 85 (Change 31, 1 May 98)
3) ER 415-1-11, Biddability, Constructibility, Operability, and Environmental Review, 1 Sep 94
4) ER 1105-2-100, Planning Guidance Notebook, 22 Apr 00
5) ER 1110-1-12, Engineering and Design, Quality Management, 1 Jun 93
6) ER 1110-1-8156, Engineering and Design, Policies, Guidance, and Requirements for Geospatial Data and Systems, 1 Aug 96
7) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 99
8) ER 1110-2-1302, Civil Works Cost Engineering
9) ER 1165-2-132, HTRW Guidance for Civil Works Projects

e. Engineering Manuals (EM), U.S. Army Corps of Engineers

1) EM 1110-1-2909, Engineering and Design, Geospatial Data and Systems,

f. Engineering Circulars (EC), U.S. Army Corps of Engineers

1) EC 1110-2-8159,

g. Engineering Publications

1) EP 1165-2-1, Digest of Water Resources Policies and Authorities, 30 Jul 99

h. Federal Acquisition Regulations (FAR)
1) 52.248-3,

i. Critical Project Report for Taylor Creek/Nubbin Slough, OKEECHOBEE WATER RETENTION AREAS PROJECT, Final Report, January 2000 (Addendum April 2001)

j. Water Resources Development Act (WRDA)
1) 1999, CERP
2) 2000, Everglades Provision, Title VI, 11 Dec 00

k. Lake Okeechobee Protection Program (HB 991/SB 1640)

L. Principles and Guidelines (P&G) for Water and Related Land Resources

m. Water Quality in Southern Florida, 1996-98, by Benjamin F. McPherson, Ronald L. Miller, Kim H. Haag, and Anne Bradner; USDA/USGS Circular 1207, ISBN 0-607-95413-2.

n. U.S. Army Corps of Engineers. 1999. Central and South Florida Project Comprehensive Review Study. Final Integrated Feasibility Report and Programmatic Environmental Impact Statement. Jacksonville District Office; Jacksonville, Florida.

o. U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered species consultation handbook. Procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act. U.S. Government Printing Office; Washington D.C.

2.0 Forms:

a. State of Florida Environmental Resource Permit Application.

TAB B of Appendix T – Standard Project Milestones

This section is reserved for documents that will be developed and made available at a later date.

TAB C of Appendix T – Code of Accounts

This section is reserved for documents that will be developed and made available at a later date.

TAB D of Appendix T– Work Breakdown Codes

This section is reserved for documents that will be developed and made available at a later date.

Appendix U: Construction Management

This section is reserved for documents that will be developed and made available at a later date.

Construction (By Expense)

Construction Contract

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2410	Construction Contract	482	7/26/07	6/30/09	0	$62,325,240
01-2420	Construction Contract	850	2/4/10	6/27/13	135	$123,959,817

Summary for ' Construction Contract (2 detail records)

Sum for Resource ***$186,285,057***

Summary for = Construction (2 detail records)

Sum for Category ***$186,285,057***

Appendix V: Advanced Plan Formulation

	Total	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Plan Formulation	**1554675**	**10450**	**236550**	**314049**	**476408**	**352146**	**59052**	**58596**	**47424**	**0**	**0**	**0**	**0**	**0**
Contract														
Biologist	75924		20064	17618	18634	19608								
Cost Estimator	19380		4560		4560	10260								
Ecologist	38532		6840	8498	14074	9120								
Economist	21660		6840	5700	2280	6840								
Engineer-Design	49248		5700	8498	23194	11856								
Engineer-Hydraulic	38988		4560	6529	13763	14136								
GIS Technician	64524			14364	35568	14592								
Hydrologist	9120			9120										
Hydrologic Modelor	25536		5700	3109	4871	11856								
Planner	136116		11400	26904	58596	39216								
Project Manager	67260		6840	17784	28956	13680								
Real Estate	22116		1140		9120	11856								
Sociologist	18240		9120			9120								
Water Quality	34428			9804	15048	9576								
Contractor Total	**621072**	**0**	**82764**	**127928**	**228664**	**181716**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Biologist	58596		12312	23930	18706	3648								
Cost Estimator	20064		4560	3938	7462	4104								
Economist	43320		22344	7586	9742	3648								
Engineer-Design	28899			8058	13203	7638								
Engineer-Geotech	31008		3648	8498	12022	6840								
Hydrology & Hydraulics	67032		15048	28562	13846	9576								
Planning Tech Lead	540588	10450	60762	60178	127846	116280	59052	58596	47424					

Project Manager	1368			1368										
Real Estate	13680			6218	5182	2280								
Water Quality	24168		3648	9866	5638	5016								
Corps Total	**828723**	**10450**	**122322**	**158202**	**213647**	**159030**	**59052**	**58596**	**47424**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Economist	31008		12312	5306	9742	3648								
Modelor	33288		12312	7586	9742	3648								
Operations	21204		4560	6529	7151	2964								
Public Outreach	2280				2280									
Project Manager	2280			2280										
Real Estate	14820		2280	6218	5182	1140								
SFWMD Total	**104880**	**0**	**31464**	**27919**	**34097**	**11400**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Construction	**186769736**	**0**	**0**	**0**	**0**	**0**	**0**	**5512218**	**24614904**	**24614904**	**42861609**	**37943024**	**37797088**	**13425993**
Lake O Construction	124044496										34878396	37943024	37797088	13425993
TCNS Construction	62725240							5512218	24614904	24614904	7983213			
Construction Total	**186769736**	**0**	**0**	**0**	**0**	**0**	**0**	**5512218**	**24614904**	**24614904**	**42861609**	**37943024**	**37797088**	**13425993**

Advanced Plan Formulation (By Resource)

Contractor - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$20,064
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$10,032
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Biologist (7 detail records)

Sum for Resource ***$52,896***

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Cost Estimator (7 detail records)

Sum for Resource ***$22,800***

Contractor - Cultural Resource

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1959	Cultural Resources Initial Assessment - TC	120	3/24/04	9/13/04	78	$300,276
01-2091	Cultural Resources Initial Assessment - LO	120	7/28/04	1/24/05	324	$50,160

Summary for ' Contractor - Cultural Resource (2 detail records)

Sum for Resource ***$350,436***

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140

01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$6,840
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Design Engineer (12 detail records)

Sum for Resource ***$48,792***

Contractor - Ecologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$4,560
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Ecologist (10 detail records)

Sum for Resource ***$38,532***

Contractor - Economist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Economist (7 detail records)

Sum for Resource ***$21,660***

Contractor - GIS Tech

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$2,280

01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$5,016
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$6,840
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - GIS Tech (10 detail records)

Sum for Resource ***$59,508***

Contractor - H&H Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$2,280
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$10,032
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - H&H Engineer (10 detail records)

Sum for Resource ***$38,532***

Contractor - Hydro Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$2,280
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$2,280
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Hydro Modelor (8 detail records)

Sum for Resource ***$20,520***

Contractor - Hydrologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120

Summary for ' Contractor - Hydrologist (1 detail record)

Sum for Resource ***$9,120***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$6,840
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$4,560
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$9,120
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$10,032
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$10,032
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$10,032
01-1960	Draft Report - TCNS	22	1/7/05	2/9/05	0	$4,560
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$10,032
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$17,100
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$10,032
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$10,032

Summary for ' Contractor - Planner (16 detail records)

Sum for Resource ***$136,116***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$2,280
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1510	Final Assessment Report	44	5/22/03	7/25/03	2615	$4,560
01-1770	Initial Alternative Plans - TCNS Contractor	44	7/25/03	9/26/03	0	$4,560
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$10,032
01-1810	Final Alternative Plan Document - TCNS	22	2/23/04	3/24/04	0	$1,140
01-1880	Draft Alt Plan Evaluation Document - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1910	Final Evaluation Document - TCNS	22	12/6/04	1/7/05	0	$2,280
01-1960	Draft Report - TCNS	22	1/7/05	2/9/05	0	$4,560
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$6,840
01-2090	Final Alt Plan Document - LO	22	6/25/04	7/28/04	180	$4,560
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Project Mgr (14 detail records)

Sum for Resource ***$67,260***

Contractor - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$1,140
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$6,840
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Real Estate (6 detail records)

Sum for Resource ***$21,660***

Contractor - Sociologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1272	Draft Performance Measures Contractor	44	12/5/01	2/8/02	148	$4,560
01-1279	Finalize Performance Measures	44	5/14/02	7/17/02	148	$4,560
01-1968	TCNS Final Deliverable Draft Report	22	2/9/05	3/14/05	0	$2,280
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560
01-2248	Final Deliverable Draft PIR/EIS - LO	44	9/19/05	11/22/05	180	$4,560

Summary for ' Contractor - Sociologist (5 detail records)

Sum for Resource ***$20,520***

Contractor - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1480	Draft Assessment Report	22	2/21/03	3/25/03	0	$1,140
01-1780	Final Alternative Plans - TCNS	22	10/29/03	12/3/03	0	$2,280
01-2040	Initial Alternative Plans - LO Contractor	66	7/25/03	10/29/03	180	$10,032
01-2060	Final Alt Plans - LO	44	12/3/03	2/6/04	180	$11,400
01-2190	Final Alt Plan Evaluation Report - LO	22	7/18/05	8/17/05	180	$4,560

Summary for ' Contractor - Water Quality (5 detail records)

Sum for Resource ***$29,412***

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,032
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$10,944
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$23,484
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280

Summary for ' Corps - Biologist (7 detail records)

Sum for Resource ***$52,668***

Corps - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,824
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280

Summary for ' Corps - Cost Estimator (5 detail records)

Sum for Resource ***$15,504***

Corps - Cultural Resource

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1959	Cultural Resources Initial Assessment - TC	120	3/24/04	9/13/04	78	$60,192
01-2091	Cultural Resources Initial Assessment - LO	120	7/28/04	1/24/05	324	$309,966

Summary for ' Corps - Cultural Resource (2 detail records)

Sum for Resource ***$370,158***

Corps - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$11,742
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$4,959
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$6,270
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$3,705
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$9,918
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$3,705

Summary for ' Corps - Design Engineer (6 detail records)

Sum for Resource ***$40,299***

Corps - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$20,064
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280

Summary for ' Corps - Economist (7 detail records)

Sum for Resource ***$37,392***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$4,560

Summary for ' Corps - Geotech Engineer (6 detail records)

Sum for Resource ***$19,608***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,944
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$20,064
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$4,104
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$4,104
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$5,472

Summary for ' Corps - Hydrology/Hydraulics (7 detail records)

Sum for Resource ***$53,808***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1173	Planning Tech Lead - Watershed Assess	450	7/13/01	5/1/03	14	$85,500
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$10,032
01-1538	Pln Tech Lead - TCNS	550	7/25/03	10/5/05	208	$125,400
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$2,280
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2055	Plan Tech Lead - LO PIR	1300	7/25/03	10/6/08	135	$296,400
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280

Summary for ' Corps - Planning Tech Lead (10 detail records)

Sum for Resource ***$534,660***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$2,280

01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$4,560
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280

Summary for ' Corps - Real Estate (4 detail records)

Sum for Resource ***$13,680***

Corps - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1271	Draft Performance Measure Corps	44	12/5/01	2/8/02	148	$2,280
01-1763	Initial Alternative Plans - TCNS Corps	44	7/25/03	9/26/03	0	$4,560
01-1800	PDT Alt Plan Comments - TCNS Corps	22	1/6/04	2/6/04	0	$1,368
01-1890	PDT Cmts - Draft Alt Eval Doc - TCNS Corp	22	9/29/04	11/1/04	0	$2,280
01-1980	PDT Comparison Alt Plans - TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2037	Initial Alternative Plans - LO Corps	66	7/25/03	10/29/03	180	$4,560
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$2,280
01-2170	PDT Cmts - Alt Plan Evaluation - LO Corps	22	5/13/05	6/15/05	180	$1,368

Summary for ' Corps - Water Quality (8 detail records)

Sum for Resource ***$20,064***

SFWMD - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$10,032
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$1,368
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$4,560
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,368
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$2,280

Summary for ' SFWMD - Economist (9 detail records)

Sum for Resource ***$31,008***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$10,032
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$1,368
01-1767	Inital Alternative Plans - TCNS SFWMD	44	7/25/03	9/26/03	0	$2,280
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$4,560
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,368

01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$2,280

Summary for ' SFWMD - Modelor (10 detail records)

Sum for Resource ***$33,288***

SFWMD - Operations

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1273	Draft Performance Measures SFWMD	44	12/5/01	2/8/02	148	$2,280
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280
01-1767	Inital Alternative Plans - TCNS SFWMD	44	7/25/03	9/26/03	0	$2,280
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280
01-1885	PDT Cmts Draft Alt Eval Doc - TCNS SFW	22	9/29/04	11/1/04	0	$2,280
01-1975	PDT Comparison Alt Plans - TCNS SFWM	22	2/9/05	3/14/05	66	$1,824
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$2,280
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$1,140

Summary for ' SFWMD - Operations (10 detail records)

Sum for Resource ***$21,204***

SFWMD - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280

Summary for ' SFWMD - Project Manager (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1795	PDT Alt Plan comments - TCNS SFWMD	22	1/6/04	2/6/04	0	$2,280

Summary for ' SFWMD - Public Outreach (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1274	PDT Performance Measure Review SFWM	40	2/8/02	4/8/02	152	$2,280
01-1485	PDT review - Draft Assess Rpt SFWMD	22	3/25/03	4/24/03	0	$2,280
01-2038	Initial Alternative Plans - LO SFWMD	66	7/25/03	10/29/03	180	$4,560
01-2075	PDT Review Alt Plans - LO SFWMD	22	5/11/04	6/11/04	180	$2,280
01-2165	PDT Cmts - Alt Plan Evaluation - LO SFWM	22	5/13/05	6/15/05	180	$1,140

Summary for ' SFWMD - Real Estate (5 detail records)

Sum for Resource ***$12,540***

US Fish & Wildlife Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1962	Final FWS - CAR - TCNS	80	8/11/04	12/8/04	130	$9,244
01-2236	Final FWS - CAR - LO	10	6/15/05	6/29/05	346	$151,050

Summary for ' US Fish & Wildlife Biologist (2 detail records)

Sum for Resource ***$160,294***

Summary for = Advanced Plan Formulation (220 detail records)

Sum for Category ***$2,358,499***

Appendix W: Engineering and Design

Engineering/Design	**9337876**	**0**	**0**	**1295910**	**1888405**	**484773**	**1688402**	**2112226**	**1237440**	**630720**	**0**	**0**	**0**	**0**
Contractor														
Cost Estimator	60192				25080	35112								
Engineer-Design	90060			10633	63037	16390								
Engineer-Hydraulic	33060			985	25261	6814								
GIS Technician	37848				27609	10239								
Hydrologic Modelor	28500				23966	4534								
Planner	10032				8436	1596								
Project Manager	33592			6301	25011	2280								
Real Estate	10032				8436	1596								
Lake O Geotech Data	1000000			431818	568182									
Lake O Topo Data Col	1200000			518182	681818									
TCNS Geotech Data	355000			153295	201705									
TCNS Topo Survey	400000			172727	227273									
Contractor Total	**3258316**	**0**	**0**	**1293941**	**1885814**	**78561**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
TCNS DDR	1532000					406212	1125788							
Lake O DDR	3024000						436800	1727040	860160					
TCNS P&S	511000						125814	385186						
Lake O Plans & Specs	1008000								377280	630720				
Engineer-Geotech	4560			1969	2591									
Corps Total	**6079560**	**0**	**0**	**1969**	**2591**	**406212**	**1688402**	**2112226**	**1237440**	**630720**	**0**	**0**	**0**	**0**

Engineering and Design (By Resource)

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1820	Alt Plan Conceptual Design - TCNS	44	3/24/04	5/25/04	22	$1,539
01-1830	Alt Plan Cost Estimates - TCNS	44	5/25/04	7/28/04	22	$20,064
01-1930	Eng & Design Appendix - TCNS	22	7/28/04	8/27/04	22	$5,016
01-2110	Alt Plans Cost Estimates - LO	66	12/6/04	3/14/05	202	$30,096
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016

Summary for ' Contractor - Cost Estimator (5 detail records)

Sum for Resource ***$61,731***

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-1820	Alt Plan Conceptual Design - TCNS	44	3/24/04	5/25/04	22	$20,064
01-1930	Eng & Design Appendix - TCNS	22	7/28/04	8/27/04	22	$5,016
01-2041	Topo Data collection - LO	132	7/25/03	2/6/04	300	$10,032
01-2042	Geotech Data collection - LO	132	7/25/03	2/6/04	300	$10,032
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$28,500
01-2110	Alt Plans Cost Estimates - LO	66	12/6/04	3/14/05	202	$6,840
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016

Summary for ' Contractor - Design Engineer (9 detail records)

Sum for Resource ***$90,060***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$22,800
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$10,032
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$5,016

Summary for ' Contractor - GIS Tech (3 detail records)

Sum for Resource ***$37,848***

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$17,100
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$11,400
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$2,280

Summary for ' Contractor - H&H Engineer (4 detail records)

Sum for Resource ***$33,060***

Contractor - Hydro Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$28,500

Summary for ' Contractor - Hydro Modelor (1 detail record)

Sum for Resource ***$28,500***

Contractor - Planner

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$10,032

Summary for ' Contractor - Planner (1 detail record)

Sum for Resource ***$10,032***

Contractor - Project Mgr

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1761	Topo Data Collection - TCNS	132	7/25/03	2/6/04	32	$10,032
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$4,560
01-1830	Alt Plan Cost Estimates - TCNS	44	5/25/04	7/28/04	22	$1,539
01-2120	H&H Evaluation of Alt Plans - LO	88	7/28/04	12/6/04	180	$13,680
01-2210	Eng & Design Appendix - LO	22	3/14/05	4/13/05	202	$2,280

Summary for ' Contractor - Project Mgr (5 detail records)

Sum for Resource ***$32,091***

Contractor - Real Estate

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2100	Alt Plan Conceptual Design - LO	88	7/28/04	12/6/04	202	$10,032

Summary for ' Contractor - Real Estate (1 detail record)

Sum for Resource ***$10,032***

Corps - Geotech Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1762	Geotech Data Collection - TCNS	132	7/25/03	2/6/04	32	$2,280
01-2042	Geotech Data collection - LO	132	7/25/03	2/6/04	300	$2,280

Summary for ' Corps - Geotech Engineer (2 detail records)

Sum for Resource ***$4,560***

Summary for = Engineering and Design (31 detail records)

Sum for Category ***$307,914***

Engineering and Design (By Expense)

DDR

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2330	DDR	455	9/7/06	7/3/08	180	$3,024,000

Summary for ' DDR (1 detail record)

Sum for Resource ***$3,024,000***

DDR Contract

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2320	DDR Contract	242	8/17/05	8/7/06	0	$1,532,000

Summary for ' DDR Contract (1 detail record)

Sum for Resource ***$1,532,000***

Geotech Data

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2042	Geotech Data	132	7/25/03	2/6/04	300	$1,000,000

Summary for ' Geotech Data (1 detail record)

Sum for Resource ***$1,000,000***

Geotech Data Collection

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1762	Geotech Data Collection	132	7/25/03	2/6/04	32	$200,000

Summary for ' Geotech Data Collection (1 detail record)

Sum for Resource ***$200,000***

Plans & Specs - LO

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2380	Plans & Specs - LO	350	7/3/08	11/30/09	180	$1,008,000

Summary for ' Plans & Specs - LO (1 detail record)

Sum for Resource ***$1,008,000***

Plans & Specs - TCNS

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2370	Plans & Specs - TCNS	242	8/7/06	7/26/07	0	$511,000

Summary for ' Plans & Specs - TCNS (1 detail record)

Sum for Resource ***$511,000***

Topo Data

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1761	Topo Data	132	7/25/03	2/6/04	32	$400,000
01-2041	Topo Data	132	7/25/03	2/6/04	300	$1,200,000

Summary for ' Topo Data (2 detail records)

Sum for Resource ***$1,600,000***

Summary for = Engineering and Design (8 detail records)

Sum for Category ***$8,875,000***

Appendix X: Hydrology and Hydraulics

H&H	**466494**	**0**	**266717**	**59785**	**139992**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Biologist	4560				4560									
Cost Estimator	2280				2280									
Engineer-Design	27816				27816									
Engineer-Hydraulic	35112		10032		25080									
GIS Technician	105950		62554	28804	14592									
Hydrologist	44646		40086		4560									
Hydrologic Modelor	156754		116156	30566	10032									
Planner	32832				32832									
Project Manager	13680		2280		11400									
Real Estate	6840				6840									
Water Quality	14136		13721	415										
Contractor Total	**444606**	**0**	**244829**	**59785**	**139992**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Hydrology & Hydraulics	10944		10944											
Corps Total	**10944**	**0**	**10944**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Modelor	10944		10944											
SFWMD Total	**10944**	**0**	**10944**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Hydrology & Hydraulics (By Resource)

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$2,280

Summary for ' Contractor - Cost Estimator (1 detail record)

Sum for Resource ***$2,280***

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$5,016
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$22,800

Summary for ' Contractor - Design Engineer (2 detail records)

Sum for Resource ***$27,816***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$2,280
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$18,639
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$2,280
01-1320	Base flow estimate - pilot tribs	10	2/21/02	3/7/02	0	$1,368
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$2,280
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1350	P load estimates - storm flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1360	Bypass flow estimates - pilot tribs	10	3/21/02	4/4/02	0	$2,280
01-1370	Storage needs - pilot tribs	10	3/21/02	4/4/02	0	$1,026
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$1,368
01-1390	Base flow estimates - all tribs	66	5/6/02	8/8/02	0	$10,032
01-1400	Storm runoff estimates - all tribs	66	5/6/02	8/8/02	0	$10,032
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$6,669
01-1430	Storage needs - all Tribs	66	10/10/02	1/21/03	0	$14,250
01-1440	Bypass estimates - all Tribs	66	10/10/02	1/21/03	0	$14,250
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$10,032

Summary for ' Contractor - GIS Tech (17 detail records)

Sum for Resource ***$105,906***

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1700	Existing level of flood protection	44	1/8/02	3/13/02	236	$10,032
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$4,560

01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$4,560
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$11,400

Summary for ' Contractor - H&H Engineer (5 detail records)

Sum for Resource ***$35,112***

Contractor - Hydro Modelor

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$4,560
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$1,881
01-1290	Identify Pilot Tributaries	10	1/8/02	1/23/02	0	$4,560
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$2,280
01-1310	Select analytical method Contractor	10	2/6/02	2/21/02	0	$4,560
01-1320	Base flow estimate - pilot tribs	10	2/21/02	3/7/02	0	$4,560
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$4,560
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$4,560
01-1350	P load estimates - storm flow - pilot tribs	10	3/7/02	3/21/02	0	$4,560
01-1360	Bypass flow estimates - pilot tribs	10	3/21/02	4/4/02	0	$4,560
01-1370	Storage needs - pilot tribs	10	3/21/02	4/4/02	0	$4,560
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$2,280
01-1390	Base flow estimates - all tribs	66	5/6/02	8/8/02	0	$14,820
01-1400	Storm runoff estimates - all tribs	66	5/6/02	8/8/02	0	$14,820
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$15,219
01-1420	Storm runoff P loads - all Tribs	44	8/8/02	10/10/02	0	$15,219
01-1430	Storage needs - all Tribs	66	10/10/02	1/21/03	0	$14,592
01-1440	Bypass estimates - all Tribs	66	10/10/02	1/21/03	0	$14,592
01-1700	Existing level of flood protection	44	1/8/02	3/13/02	236	$10,032
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$10,032

Summary for ' Contractor - Hydro Modelor (20 detail records)

Sum for Resource ***$156,807***

Contractor - Hydrologist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1240	Lit review - sedimentation/other info	22	12/5/01	1/8/02	0	$10,032
01-1250	Rainfall frequency analysis	22	12/5/01	1/8/02	30	$10,032
01-1280	Tributary basin boundary delineation	90	12/5/01	4/16/02	14	$18,639
01-1380	Technical review - pilot tribs analysis	22	4/4/02	5/6/02	0	$1,368
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$4,560

Summary for ' Contractor - Hydrologist (5 detail records)

Sum for Resource ***$44,631***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$10,032
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$22,800
Summary for ' Contractor - Planner (2 detail records)				**Sum for Resource**		***$32,832***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1310	Select analytical method Contractor	10	2/6/02	2/21/02	0	$2,280
01-1790	Alternative Descriptions - TCNS	22	12/3/03	1/6/04	0	$2,280
01-1840	H&H Evaluation of Alternative Plans - TCN	44	3/24/04	5/25/04	0	$2,280
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$6,840
Summary for ' Contractor - Project Mgr (4 detail records)				**Sum for Resource**		***$13,680***

Contractor - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2070	Alt Plan Descriptions - LO	66	2/6/04	5/11/04	180	$6,840
Summary for ' Contractor - Real Estate (1 detail record)				**Sum for Resource**		***$6,840***

Contractor - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$2,736
01-1340	P load estimates - base flow - pilot tribs	10	3/7/02	3/21/02	0	$2,280
01-1410	Base flow P loads - all Tribs	44	8/8/02	10/10/02	0	$4,560
01-1420	Storm runoff P loads - all Tribs	44	8/8/02	10/10/02	0	$4,560
Summary for ' Contractor - Water Quality (4 detail records)				**Sum for Resource**		***$14,136***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1330	Storm runoff computations - pilot tribs	10	2/21/02	3/7/02	0	$1,368
01-1373	Tech review - pilot trib analysis Corps	22	4/4/02	5/6/02	0	$7,296
Summary for ' Corps - Hydrology/Hydraulics (2 detail records)				**Sum for Resource**		***$8,664***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1230	Describe WQ & flow monitoring system	22	12/5/01	1/8/02	0	$1,824

01-1240	Lit review - sedimentation/other info	22	12/5/01	1/8/02	0	$1,824
01-1250	Rainfall frequency analysis	22	12/5/01	1/8/02	30	$1,824
01-1300	Determine base flow @ structures	10	1/23/02	2/6/02	0	$1,368
01-1302	Select analytical method SFWMD	10	2/6/02	2/21/02	0	$1,824
01-1376	Tech review - pilot trib analysis SFWMD	22	4/4/02	5/6/02	0	$2,280

Summary for ' SFWMD - Modelor (6 detail records)

Sum for Resource ***$10,944***

Summary for = Hydrology & Hydraulics (69 detail records)

Sum for Category ***$459,648***

Appendix Y: Environmental Compliance

Enviro Compliance	**2065746**	**26400**	**147479**	**227642**	**737047**	**812761**	**114417**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Contractor														
Biologist	63954				5016	58938								
Cost Estimator	5700					5700								
Ecologist	77862		1368		22116	54378								
Economist	31236				30096	1140								
Engineer-Design	1368					1368								
Engineer-Hydraulic	20292				10032	10260								
GIS Technician	34428				17100	17328								
Hydrologic Modelor	34428				17100	17328								
Planner	34200		1368		11400	21432								
Project Manager	36936		1824		17100	18012								
Public Outreach	8208		1368			6840								
Real Estate	5700					5700								
Sociologist	5700					5700								
Water Quality	6156					6156								
Contractor Total	**366168**	**0**	**5928**	**0**	**129960**	**230280**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
US Fish & Wildlife Service														
US Fish & Wildlife B	1403178	26400	122399	227642	602527	424210								
USFWS Total	**1403178**	**26400**	**122399**	**227642**	**602527**	**424210**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Corps														
Biologist	44460		1368			23981	19111							
Cost Estimator	10260					5700	4560							
Economist	18924		1368			9680	7876							
Engineer-Design	16074					11504	4570							
Engineer-Geotech	27360		1368		4560	16665	4767							
Hydrology & Hydraulics	27550		1368			18575	7607							

Planning Tech Lead	50616		1368			25121	24127							
Project Manager	3648		1368			1368	912							
Public Outreach	14820		2280			3731	8809							
Real Estate	3420					1140	2280							
Water Quality	10944		1368			6177	3399							
Corps Total	**228076**	**0**	**11856**	**0**	**4560**	**123642**	**88018**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SFWMD														
Economist	19152		2736			11580	4836							
Engineer-Design	1520						1520							
Modelor	16416					11580	4836							
Operations	7448		1368			4560	1520							
Public Outreach	14364		1824			3731	8809							
Project Manager	5624		1368			898	3358							
Real Estate	3800					2280	1520							
SFWMD Total	**68324**	**0**	**7296**	**0**	**0**	**34629**	**26399**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Environmental Compliance (By Resource)

Contractor - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$8,550
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$4,560

Summary for ' Contractor - Biologist (3 detail records)

Sum for Resource ***$14,250***

Contractor - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Cost Estimator (1 detail record)

Sum for Resource ***$1,140***

Contractor - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1920	Environmental Eval Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$1,368

Summary for ' Contractor - Design Engineer (2 detail records)

Sum for Resource ***$6,384***

Contractor - Ecologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-1920	Environmental Eval Appendix - TCNS	22	8/27/04	9/29/04	0	$5,016
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$4,560
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$40,128
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$8,550
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Ecologist (7 detail records)

Sum for Resource ***$77,862***

Contractor - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$30,096
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Economist (2 detail records)

Sum for Resource ***$31,236***

Contractor - GIS Tech

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$2,280

Summary for ' Contractor - GIS Tech (4 detail records)

Sum for Resource ***$34,428***

Contractor - H&H Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$10,032
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - H&H Engineer (3 detail records)

Sum for Resource ***$15,732***

Contractor - Hydro Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016

Summary for ' Contractor - Hydro Modelor (4 detail records)

Sum for Resource ***$34,428***

Contractor - Planner

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$11,400
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$4,560
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$4,560
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$2,280
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280

Summary for ' Contractor - Planner (6 detail records)

Sum for Resource ***$26,448***

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,824
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$17,100

01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$2,280
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$10,032
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$2,280
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Project Mgr (7 detail records)

Sum for Resource ***$36,936***

Contractor - Public Relations

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1276	Perf Measure/Scoping Public Workshop	22	4/12/02	5/14/02	148	$1,368
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$4,560
01-1990	Pub Wkshp - Draft Report TCNS Contractor	22	2/9/05	3/14/05	66	$2,280
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280

Summary for ' Contractor - Public Relations (4 detail records)

Sum for Resource ***$10,488***

Contractor - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Real Estate (1 detail record)

Sum for Resource ***$1,140***

Contractor - Sociologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Sociologist (1 detail record)

Sum for Resource ***$1,140***

Contractor - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2200	Evironmental Evaluation App - LO	22	4/13/05	5/13/05	180	$5,016
01-2240	Draft PIR/EIS - LO	22	8/17/05	9/19/05	180	$1,140

Summary for ' Contractor - Water Quality (2 detail records)

Sum for Resource ***$6,156***

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,280
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$11,400
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$2,280

01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$4,560
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$3,420

Summary for ' Corps - Biologist (10 detail records)

Sum for Resource ***$36,480***

Corps - Cost Estimator

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$2,280
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560

Summary for ' Corps - Cost Estimator (2 detail records)

Sum for Resource ***$6,840***

Corps - Design Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$6,270
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,959

Summary for ' Corps - Design Engineer (3 detail records)

Sum for Resource ***$13,053***

Corps - Economist

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$4,560
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824

Summary for ' Corps - Economist (6 detail records)

Sum for Resource ***$15,504***

Corps - Geotech Engineer

Act ID	*Task Name*	*Dur*	*Start*	*Finish*	*TF*	*Budget*
01-1870	Environmental Evaluation Alt Plans - TCNS	66	5/25/04	8/27/04	0	$4,560
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2150	Environmental Evaluation Alt Plans - LO	88	12/6/04	4/13/05	180	$4,560

01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,368
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,368

Summary for ' Corps - Geotech Engineer (8 detail records)

Sum for Resource ***$21,432***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,736
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$2,736
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$285
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$2,736
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$2,736
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$228

Summary for ' Corps - Hydrology/Hydraulics (9 detail records)

Sum for Resource ***$19,665***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-1993	Pub Wkshp - Draft Report TCNS Corps	22	2/9/05	3/14/05	66	$2,280
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$10,032
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2023	ROD - TCNS Corps	44	10/20/05	12/27/05	154	$4,560
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$10,032
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$3,420

Summary for ' Corps - Planning Tech Lead (11 detail records)

Sum for Resource ***$41,496***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,368
01-2310	ROD - LO Corps	44	7/6/06	9/7/06	180	$912

Summary for ' Corps - Project Manager (3 detail records)

Sum for Resource ***$3,648***

Corps - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$2,280
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368
01-2013	Pub Wkshp - Final Report - TCNS Corps	22	8/17/05	9/19/05	176	$1,824
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,824
01-2302	Public Workshop - Final PIR/EIS - LO Corp	22	5/3/06	6/5/06	202	$1,824

Summary for ' Corps - Public Outreach (6 detail records)

Sum for Resource ***$12,540***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280

Summary for ' Corps - Real Estate (1 detail record)

Sum for Resource ***$2,280***

Corps - Water Quality

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1277	Perf Measure/Scoping Public Mtg Corps	22	4/12/02	5/14/02	148	$1,368
01-2003	Final Draft Report TCNS Corps	44	6/15/05	8/17/05	0	$4,560
01-2253	Public Wkshp - Draft PIR/EIS - LO Corps	22	11/22/05	12/27/05	224	$1,368
01-2273	Final Draft PIR/EIS - LO Corps	44	3/2/06	5/3/06	180	$2,280

Summary for ' Corps - Water Quality (4 detail records)

Sum for Resource ***$9,576***

SFWMD - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$2,736
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22	2/9/05	3/14/05	66	$2,280
01-2006	Final Draft Report TCNS SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,368
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Economist (9 detail records)

Sum for Resource ***$19,152***

SFWMD - Engineering Design

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539

Summary for ' SFWMD - Engineering Design (1 detail record)

Sum for Resource ***$1,539***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-1996	Pub Wkshp - Draft Report TCNS SFWMD	22	2/9/05	3/14/05	66	$2,280
01-2006	Final Draft Report TCNS SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,368
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Modelor (8 detail records)

Sum for Resource ***$16,416***

SFWMD - Operations

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,368
01-1966	PDT Review Draft Report - TCNS SFWMD	22	2/9/05	3/14/05	0	$2,280
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539

Summary for ' SFWMD - Operations (4 detail records)

Sum for Resource ***$7,467***

SFWMD - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,368
01-2030	ROD - TCNS SFWMD	44	10/20/05	12/27/05	154	$1,539
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824
01-2303	ROD - LO SFWMD	44	7/6/06	9/7/06	180	$912

Summary for ' SFWMD - Project Manager (4 detail records)

Sum for Resource ***$5,643***

SFWMD - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1278	Perf Measure/Scoping Public Mtg SFWMD	22	4/12/02	5/14/02	148	$1,824
01-2010	Public Review - Final Report - TCNS	44	8/17/05	10/20/05	154	$1,368

01-2016	Pub Wkshp - Final Report - TCNS SFWMD	22	8/17/05	9/19/05	176	$1,824
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$3,420
01-2256	Public Wkshp - Draft PIR/EIS - LO SFWMD	22	11/22/05	12/27/05	224	$1,824
01-2290	Public Review Final PIR/EIS	44	5/3/06	7/6/06	180	$2,280
01-2301	Public Workshop - Final PIR/EIS - LO SFW	22	5/3/06	6/5/06	202	$1,824

Summary for ' SFWMD - Public Outreach (7 detail records)

Sum for Resource ***$14,364***

SFWMD - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2246	PDT Review Draft PIR/EIS - LO SFWMD	44	9/19/05	11/22/05	180	$2,280
01-2276	Final Draft PIR/EIS - LO SFWMD	44	3/2/06	5/3/06	180	$1,539

Summary for ' SFWMD - Real Estate (2 detail records)

Sum for Resource ***$3,819***

US Fish & Wildlife Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1956	Endangered Species Consultation - TCNS	65	3/24/04	6/24/04	485	$0
01-1957	Draft Fish & Wildlife Coord Act Report - TC	98	3/24/04	8/11/04	100	$508,440
01-1970	Public Review DEIS - TCNS	66	3/14/05	6/15/05	0	$0
01-2233	Endangered Species Consultation - LO	64	7/28/04	10/28/04	380	$0
01-2234	Draft Fish & Wildlife Coord Act Report - LO	220	7/28/04	6/15/05	224	$604,770
01-2250	Public Review Draft PIR/EIS - LO	66	11/22/05	3/2/06	180	$0

Summary for ' US Fish & Wildlife Biologist (6 detail records)

Sum for Resource ***$1,113,210***

Summary for = Environmental Compliance (151 detail records)

Sum for Category ***$1,661,892***

Appendix Z: United States Fish and Wildlife Service Coordination

Outline for a Fish and Wildlife Coordination Act Report

I. PURPOSE, SCOPE, AND AUTHORITY

A. Introduction
B. Purpose and Scope of Project
C. Authority

II. AREA SETTING

A. Project Location
B. Description of Study Area
1. Hydrological Description
2. Ecological Description
3. Fish and Wildlife Resources
a. Federally Listed and Candidate Species – This section indicates which listed species have been considered in the informal or formal consultation. Some basic biology of the species and any particular information about occurrence in the project area are included here.
b. State Listed Species
c. Other Fish and Wildlife Resources

III. FISH AND WILDLIFE RESOURCE CONCERNS

A. Introduction
B. Resource Concerns – Examples include wetland and upland habitat protection, avoiding adverse effects on listed species, and integration with the CERP.
C. Summary/Planning Objectives

IV. EVALUATION METHODOLOGY

Optional section if no formal methodology is used on a small project. Reports on major components of the CERP include a description of the hydrologic and ecological evaluation tools applied to the study. If standard methodologies have been modified, the report documents where assumptions or procedures differ from a published source.

V. FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

VI. DESCRIPTION OF SELECTED PLAN/PROJECT AND OTHER ALTERNATIVES

A preferred alternative should be selected by the Corps prior to submission of a draft FWCA report. The Service should be actively involved in the planning, development, and evaluation of alternatives so that the likelihood of consensus during plan selection is maximized. If the Service supports another alternative not selected by the Corps, the proposal of this alternative may be appropriate in the draft FWCA report. If the Service recommends modification of the

Corps' selected plan, this reasoning will be based on resource issues presented in Section III. B. Of this outline, and recommendations are presented in Section X. of this outline.

VII. POTENTIAL ADVERSE AND BENEFICIAL EFFECTS OF THE PROJECT

The description of impacts includes an estimate of their geographic and temporal extent. Construction-related impacts are generally of smaller geographic scope, and can be either of short or long duration. Operational impacts are of longer duration and can be localized or have regional effects. Long-term and regional impacts are more likely to include both adverse and beneficial aspects. If a short-term adverse impact produces long-term system-wide benefits, the Service must acknowledge those benefits. The "Evaluation of the Project" section provides a discussion of the balance of these effects, and the "Summary of Position" section includes an overall recommendation by the Service. An example of one organization might be as follows, but varies according to the specifics of the project:

A. Construction-Related Effects
B. Operational Effects
C. Effects on Wildlife-Related Recreation
D. Summary of Consultation under the Endangered Species Act

VIII. EVALUATION OF THE PROJECT

This section includes a summary of the Service's evaluation of the preferred alternative and includes the relationship to the CERP. This serves to identify any issues regarding compatibility or interdependency with other elements of the Comprehensive Plan. Does the project adequately support regional or system-wide ecological restoration goals? Does the project form part of a larger strategy to reach restoration goals? What implications would

implementation of each alternative have on previous, ongoing, or future elements of the Comprehensive Plan?

IX. RECOMMENDATIONS/CONSERVATION MEASURES

The Service provides recommendations regarding short and long-term impacts to fish and wildlife resources and opportunities for ecosystem restoration and recovery of listed species within the project area as guided by the Service's Multi-Species Recovery Plan.

X. SUMMARY OF POSITION

XI. LITERATURE CITED

XII. APPENDICES

Appendix AA: Project Management

Project Management (By Resource)

Contractor - Project Mgr

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1520	PMP Update - Assess Phase Contract	44	5/22/03	7/25/03	0	$10,032

Summary for ' Contractor - Project Mgr (1 detail record)

Sum for Resource ***$10,032***

Corps - Biologist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$4,560
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021

Summary for ' Corps - Biologist (3 detail records)

Sum for Resource ***$9,861***

Corps - Cost Estimator

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560

Summary for ' Corps - Cost Estimator (2 detail records)

Sum for Resource ***$7,581***

Corps - Design Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$1,881
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$1,254
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$1,881

Summary for ' Corps - Design Engineer (3 detail records)

Sum for Resource ***$5,016***

Corps - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280

Summary for ' Corps - Economist (1 detail record)

Sum for Resource ***$2,280***

Corps - Geotech Engineer

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$30,096

01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560

Summary for ' Corps - Geotech Engineer (4 detail records)

Sum for Resource ***$39,957***

Corps - Hydrology/Hydraulics

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$3,420
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$3,192
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$2,280
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$6,840

Summary for ' Corps - Hydrology/Hydraulics (4 detail records)

Sum for Resource ***$15,732***

Corps - Planning Tech Lead

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280

Summary for ' Corps - Planning Tech Lead (1 detail record)

Sum for Resource ***$2,280***

Corps - Procurement

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$4,560

Summary for ' Corps - Procurement (1 detail record)

Sum for Resource ***$4,560***

Corps - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1175	Proj Mgt - Watershed Assess - Corps	450	7/13/01	5/1/03	14	$85,500
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280
01-1525	Cooperative Agreement w/ USGS (Corps)	66	7/27/01	10/30/01	447	$912
01-1535	TCNS PIR Proj Mgt - Corps	550	7/25/03	10/5/05	208	$125,400
01-2035	Congressional Committee Approval - TCNS	176	12/27/05	9/7/06	154	$2,280
01-2052	LO PIR Proj Mgt - Corps	1300	7/25/03	10/6/08	135	$296,400
01-2340	Congressional Authorization - LO	264	10/6/08	10/27/09	135	$4,560

Summary for ' Corps - Project Manager (7 detail records)

Sum for Resource ***$517,332***

Corps - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1513	PMP Update - Assess Phase Corps	44	5/22/03	7/25/03	0	$2,280

Summary for ' Corps - Public Outreach (1 detail record)

Sum for Resource ***$2,280***

Corps - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2034	TCNS PIR update of PMP Corps	44	6/15/05	8/17/05	0	$3,021
01-2277	LO PIR PMP update Corps	66	5/3/06	8/7/06	202	$4,560

Summary for ' Corps - Real Estate (2 detail records)

Sum for Resource ***$7,581***

SFWMD - Economist

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$4,560

Summary for ' SFWMD - Economist (1 detail record)

Sum for Resource ***$4,560***

SFWMD - Engineering Design

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Engineering Design (3 detail records)

Sum for Resource ***$9,861***

SFWMD - Modelor

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$4,560

Summary for ' SFWMD - Modelor (1 detail record)

Sum for Resource ***$4,560***

SFWMD - Monitoring

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560

Summary for ' SFWMD - Monitoring (1 detail record)

Sum for Resource ***$4,560***

SFWMD - Operations

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Operations (2 detail records)

Sum for Resource ***$7,581***

SFWMD - Permits

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Permits (2 detail records)

Sum for Resource ***$7,581***

SFWMD - Procurement

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560

Summary for ' SFWMD - Procurement (1 detail record)

Sum for Resource ***$4,560***

SFWMD - Project Manager

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1177	Proj Mgt - Watershed Assess - SFWMD	450	7/13/01	5/1/03	14	$205,200
01-1527	Cooperative Agreement w/USGS (SFWMD)	66	7/27/01	10/30/01	447	$4,560
01-1537	TCNS PIR Proj Mgt - SFWMD	550	7/25/03	10/5/05	208	$250,800
01-2054	LO PIR Proj Mgt - SFWMD	1300	7/25/03	10/6/08	135	$592,800

Summary for ' SFWMD - Project Manager (4 detail records)

Sum for Resource ***$1,053,360***

SFWMD - Public Outreach

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280

Summary for ' SFWMD - Public Outreach (1 detail record)

Sum for Resource ***$2,280***

SFWMD - Real Estate

Act ID	Task Name	Dur	Start	Finish	TF	Budget
01-1516	PMP Update - Assess Phase SFWMD	44	5/22/03	7/25/03	0	$2,280
01-2033	TCNS PIR update of PMP SFWMD	44	6/15/05	8/17/05	0	$3,021
01-2278	LO PIR PMP update SFWMD	66	5/3/06	8/7/06	202	$4,560

Summary for ' SFWMD - Real Estate (3 detail records)

Sum for Resource ***$9,861***

Summary for = Project Management (49 detail records)

Sum for Category ***$1,733,256***