

Acme's drainage area is divided into two basins, Basin A and Basin B. Pierson Road and Canal C-23 divide the two basins. Basin A is characterized by low and medium-density residential development, whereas Basin B is dominated by rural land uses. Drainage from Basin A is routed north and discharges to Canal C-51. Drainage from Basin B was originally routed south and discharged to the Refuge but this has now changed due to implementation of the project components explained in Section 3.1.1 below. During very large storm events, drainage from Basin A previously overflowed into Basin B. This Part 3 addresses only that drainage which is generated within Acme Basin B and historically discharged to the Refuge, including any overflows from Basin A. Basin A is included in the C-51 West Basin, which is tributary to STA-1E and, as a result, is addressed in Part 2 of the October 27, 2003 *Everglades Protection Area Tributary Basins Long-Term Plan for Achieving Water Quality Goals* (Long-Term Plan), and subsequent approved revisions.

Acme Basin B encompasses an area of approximately 8,800 acres south of Pierson Road and Canal C-23 within the Village. Land use consists primarily of rural residential development and agriculture. There are also a number of horse farms and other equestrian facilities in the basin.

Drainage from Acme Basin B is collected in a network of interconnected lakes and canals that are operated by the Village to provide water supply and flood protection throughout the basin. Prior to the recent Acme Basin B drainage system modifications, two pumping stations, both located along the L-40 Canal, were operated to discharge water into the L-40 borrow canal inside the Refuge. Acme Pump Station #1 (PS1) conveyed water from Canals C-2, C-25 and C-27 through the Acme 1DS structure into the Refuge. Acme Pump Station #2 (PS2) conveyed water from Canals C-4 and C-26 through the South Florida Water Management District's (District's) G-94D Structure to the Refuge. Prior to December 31, 2006, PS1 had a permitted capacity of 100,000 gallons per minute (gpm) or 222 cubic feet per second (cfs), and PS2 had a permitted capacity of 120,000 gpm or 267 cfs.

In 2000, the Village passed a BMP ordinance as part of its cooperative efforts with the District to improve water quality in discharges to the Everglades. The ordinance places controls on the storage and application of fertilizer and includes an educational component

on the proper use of fertilizers and irrigation practices. Of particular importance in Acme Basin B are requirements for the storage, handling and transport of waste materials from livestock operations, including horse farms and equestrian facilities. It is likely that high TP concentrations in runoff from these facilities have contributed significantly to the overall phosphorus load entering the Refuge from this basin. As the Village's BMP ordinance has been in effect for only a short time, water quality improvements resulting from its implementation have yet to be quantified. During the development of the 2003 Long-Term Plan, it was assumed that implementation of source controls would (1) have no effect on the 31-year baseline flows simulated by the District, and (2) would reduce the annual TP load in runoff from Acme Basin B by 25 percent. These assumptions were applied uniformly to the evaluation of all alternatives and had the net effect of reducing the flow-weighted mean TP concentration in runoff from Acme Basin B from 94 ppb to 71 ppb. In the subsequent EAA Regional Feasibility Study (EAARFS) completed in late 2005, the Acme Basin B runoff flow and load estimates were updated using water quality data that included water years 1990-2004 (an additional five years compared to the earlier study that used data from water years 1990-1999). The resulting flow-weighted mean TP concentration for the Acme Basin B runoff used for the EAARFS was 113 ppb.

3.1.1. Recommended Improvements and Strategies

The projects in the October 2003 Long-Term Plan were designed to achieve compliance with the water quality standards for the Everglades Protection Area (EPA) based on specific assumptions and the best available information. One of the key assumptions during the development of the Long-Term Plan was that the strategy for Acme Basin B, as well as determination of its implementation schedule, would be accomplished through the CERP planning process.

Subsequent to completion of the Long-Term Plan, it was determined that the overall timeframe associated with the CERP planning process might impact the ability to complete the Acme Basin B project by the originally planned date of December 31, 2006, and within the original budget. Also subsequent to the completion of the Long-Term Plan, it was confirmed that the optimal plan for addressing Acme Basin B discharges would include discharging to the C-51W Canal for eventual treatment in STA-1E.

As part of the *adaptive implementation process* envisioned by the Long-Term Plan, it was anticipated that further refinements to the Long-Term Plan would be made as more scientific and engineering information was obtained.

Prior to December 31, 2006, PS1 and PS2 discharged stormwater runoff from Acme Basin B directly into the Refuge, part of the EPA. The purpose of the Acme Basin B project is to divert stormwater runoff from Acme Basin B to the C-51 West Canal and then to STA-1E for treatment prior to discharge to the Refuge. Excess available water may be used to meet water supply demands in central and southern Palm Beach County.

The re-routing of Acme Basin B runoff to the C-51 West Canal required numerous infrastructure changes within the Village's system. As part of those changes the District has been responsible for completing the following features as previously identified in the March 2006 Long-Term Plan revision:

- Improvements to the C-1 Canal to increase conveyance capacity and connect the C-1 Canal to the C-51 West Canal
- Construction of new pump station PS7 to pump from the C-1 Canal into the C-51 West Canal
- Construction of a detention area on the District-owned Section 24, Township 44 South, Range 40 East property (e.g., lands situated immediately south of the Rustic Ranches subdivision and west of Flying Cow Road) for temporary offline storage
- Construction of new pump station PS24 to fill the Section 24 detention area

The District's project will pump stormwater from Acme Basin B into a temporary detention area where it will be attenuated and discharged back into the Acme Basin B canal system at a rate matching evapo-transpiration. The detention area will provide water quality treatment while recharging the canal systems (resulting in a reduction of seepage losses from the Refuge) and will provide reductions in discharges from Acme Basin B into the C-51 West Canal, as well as reductions in water supply demands from the Refuge. The flows that are not retained in the Village's water management system will be routed north through the C-1 Canal, which will be connected to the C-51 West Canal via PS7 and will ultimately flow to STA-1E for treatment prior to discharging to the Refuge.

The project design is based on the Basin Specific Feasibility Studies which included evaluations by Brown & Caldwell in the October 23, 2002, *Basin Specific Feasibility*

Studies, Everglades Stormwater Program Basins and Burns & McDonnell in the October 23, 2002 Evaluation of Alternatives for the ECP Basins. In these studies, five alternatives were evaluated with the fifth alternative (identified as Alternative No. 2 in the *Evaluation of Alternatives for the ECP Basins*) recommended as the basis for the project.

The District's Acme Basin B project has been divided into two design packages. The status of these packages is shown below.

Package 1: C-1 Canal Improvements and Pump Station PS7

- C-1 Canal Improvements – construction complete
 - 3 miles of modified section increasing conveyance capacity from 67 to 220 cfs
 - Two 84-inch culverts at FPL crossing
 - Realignment and setback requirements for Flying Cow Road
- Pump Station PS7 – temporary pumps are complete: permanent pump station is being transferred to the Village for design and construction
 - Connects C-1 Canal to C-51 West Canal
 - 220 cfs (98,736 gpm) pumping capacity
 - Includes gravity discharge bay

Package 2: Section 24 Detention Area and Pump Station PS24

- Section 24 Detention Area – preliminary design complete
 - Converts 365 acres of agricultural land to impoundment area
 - Storage of up to 5 feet of water (1,028 ac-ft)
 - Two gated culverts (100 cfs each) for inflow/outflow
- Pump Station PS24 – preliminary design complete
 - Section 24 Detention Area Inflow pump station
 - 200 cfs (89,760 gpm) pumping capacity
 - 50 cfs (22,440 gpm) seepage pump capacity

Pursuant to the Memorandum of Understanding (Contract Number CN051212) of May 31, 2005 between the District and the Village, construction was initiated by the District on Package 1: C-1 Canal improvements and PS7. As construction proceeded on work associated with PS7, stakeholder concerns were received concerning the location and type of pump station proposed. The Village agreed to lend its support to the District to effect a change in the pump station location to the west of Flying Cow Road and a change in the type of pump from diesel to electric power to reduce the noise impact to local residents. While these stakeholder concerns were being worked out, the District moved forward and completed construction of the C-1 Canal improvements and installed temporary pumps to

direct runoff from Acme Basin B into the C-51W Canal. This work met the intent of the Long-Term Plan by diverting Acme Basin B runoff from the Refuge by December 31, 2006.

Also as a result of the need to relocate and redesign PS7, the Village and the District initiated development of an amendment to the 2005 MOU to incorporate the revised project features. Amendment No. 1 to the 2005 MOU defines the level of support mutually agreed upon; the essence being that the Village will undertake the redesign of PS7 to a Village standard electric pump design as well as the construction and future operation and maintenance of the new facility. Amendment No. 1 to the 2005 MOU was approved by the District's Governing Board on May 10, 2007; and by the Village on June 19, 2007. Amendment No. 1 allows for the removal of the PS7 annual operation and maintenance costs from the Long Term Plan budget. All other costs for PS7 are anticipated to remain as projected in the March 2006 Long Term Plan revision. MOU Amendment No. 1 does not change any other responsibilities of the Village for the evaluation, design and construction of the following improvements:

- Replace and reconfigure the Village's six control structures along Pierson Road at the Village's canals C-1, C-2, C-4, C-6, C-7 and C-8; and water control structures 40, 123, 42, 43, 44 and 45 respectively. Additional modifications will be made to ACME Basin B water control structures 108, 144, 52, 95 and 66;
- Use of the backup pumps and modifications to the Village's Pump Station Numbers 3, 4 and 6 in the Village's C-2, C-7 and C-8 Canals. The nominal capacities of those backup pumps are 60,000 gpm, 60,000 gpm and 62,000 gpm, respectively.
- New Pump Station Number 8 with a capacity of 125 cfs (56,100 gpm) at Pierson Road and the C-2 Canal.

The Village completed the above-listed modifications to the Acme system to divert Basin B discharges to the C-51 West Canal in 2006.

PS1 was retired from drainage service on December 31, 2006. An existing two-way pump at PS2 and culverts at both pump stations (PS1 and PS2) will remain in use for water supply withdrawals from the Refuge. As such, the Village's master system ERP permit which covered

these two pump stations was modified to state that PS1 was to be dismantled and PS2 can only be used for water supply purposes and if in the future PS2 is required for discharges from the Village, a permit modification or Emergency Order would be required.

Work on Package 2, the Section 24 Detention Area and PS24 has progressed to a Preliminary (30%) Design. This Preliminary Design included an Opinion of Probable Construction Cost which was approximately twice that which was identified at Basis of Design Report stage (which was the same as the costs shown in the March 2006 Long-Term Plan revisions), which was the basis for the allocated budget. The cost increase was attributed mainly to the following reasons:

- The addition of a seepage control system
- Change in design standards for embankments (as opposed to levees or berms)
- Change to wetland vegetative planting plan to compensate for change to a slow release operational plan
- Other miscellaneous detailed design changes

A value engineering (VE) review of the Preliminary Design was conducted to examine methods and opportunities to reduce the projected cost and keep it within budget. Two key items were identified to reduce costs:

- Change PS24 from diesel to electric power
- Remove wetland park elements and simply construct an impoundment for flood attenuation purposes (with 1,028 ac-ft being the design parameter provided by the Village from its hydraulic system model to maintain the current level of flood protection)

The Village has agreed to participate in a further VE review with particular emphasis on the system model and the storage volume required to maintain the current level of flood protection.

Depending upon the outcome of the further VE review with the Village, the District may opt to conduct the design, construction and operation and maintenance for Section 24 Detention Area and PS24, or may provide a range of opportunities for the Village's further involvement in any or all of these functions.

3.1.3. Estimate of Capital Cost

A revised estimate of the capital cost for implementing the Acme Basin B project is presented in Table 3.2. This estimate does not include the portion of the project being completed and funded by the Village and the estimate varies from that presented in the October 27, 2003, Long-Term Plan and the March 2006 revisions.

Table 3.2 Estimate of Capital Cost, Acme Basin B Project

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost
1	C-1 Canal Improvements and Flying Cow Road Improvements (excess fill removal)	Job	Lump	Sum	\$4,000,000
2	Pump Station at C-1 canal and C-51 Canal (220 cfs)	Job	Lump	Sum	\$5,000,000
3	Section 24 Detention Area, Pump Station, Structures and Seepage Control (270 cfs)	Job	Lump	Sum	\$14,600,000
4	Recreation: includes connection to west & parking area for approximately 5 cars	Job	Lump	Sum	\$500,000
5	Water Quality Monitoring Stations	Job	1	\$56,275	\$56,275
Subtotal, Estimated Construction Costs					\$24,156,275
	Planning, Engineering & Design Program & Construction Management	10 %			\$2,415,628
	Interim Operations During Construction	7 %			\$1,690,940
		14 %			\$3,381,879
	Total Estimated Cost, Without Contingency				\$31,644,722
	Contingency	5 %			\$1,582,236
	TOTAL ESTIMATED CAPITAL COST				\$33,226,958

The above estimate is stated in FY 2006 dollars and was essentially obtained from the Acceler8 Basis of Design Report for the Acme Basin B project.

Since the generation of the above costs, a construction contract for Package 1 has been awarded. Whereas the above table shows Package 1 costs of \$9,000,000, the construction

contract value was \$13,300,000. Through the joint work with the Village, the latest projected construction cost for Package 1 can be lowered to \$11,600,000. However, it is still greater than the original budget and hence the reason for the additional value engineering work being pursued to contain the future project costs.

3.1.4. Estimate of Incremental Operation and Maintenance Cost

The following is a summary of the anticipated incremental operation and maintenance requirements for the redirection of Acme Basin B discharges to the C-51 West Canal and STA-1E (e.g. requirements in addition to those for operation and maintenance of STA-1E and the C-51 West Canal Enlargement). With one exception, these costs are all associated with operation and maintenance of the Section 24 pump station. That exception is the inclusion of additional fuel consumption at S-362 (outflow pump station for STA-1E) resulting from the additional discharges from Acme Basin B.

- Mechanical maintenance of the new pumping unit and diesel engine drive (PS24);
- Maintenance of the additional pump station building (PS24);
- Fuel consumption in the new pump station (PS24);
- Operating personnel (as the new pump station (PS24) will operate in close proximity to S-319, it is anticipated that one full-time equivalent, or FTE, engine operator will need to be added to the operations team for S-319);
- Additional fuel consumption at S-362.

An estimate of the incremental operation and maintenance cost for diversion of Acme Basin B discharges is presented in Table 3.3 and is stated in FY 2006 dollars.

Table 3.3 Estimate of Incremental O&M Cost, ACME Basin B Project

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
1	Mechanical Maintenance, New Pumping Unit	1	Ea.	\$77,846	\$77,846	
2	Maintenance, building	1	Ea.	\$20,037	\$20,037	Unit cost from Evaluation Methodology
3	Fuel Consumption, New Pumping Unit	38654	Ac. Ft.	\$0.88	\$34,016	Unit cost from Evaluation Methodology
4	Engine Operator/Maintenance Mechanic	1	Ea.	\$172,615	\$172,615	Unit cost from Evaluation Methodology
5	Additional Fuel Consumption at S-362	38654	Ac. Ft.	\$0.88	\$34,016	Unit cost from Evaluation Methodology
6	Water Quality Monitoring PS24	1	Ea.	\$45,000	\$45,000	Unit cost from Evaluation Methodology
Subtotal, Estimated Incremental Operation & Maintenance Costs					\$383,529	
Contingency		30	%		\$115,059	
TOTAL INCREMENTAL O&M COST					\$498,588	\$500,000

3.1.5. Implementation Schedule

The water management system is operational with the construction of the C-1 Canal improvements and temporary pumps completed by December 31, 2006. The revised schedule for completion of the Section 24 Detention Area and PS24 is as follows:

VE review with Village:	3 months
Design:	12 months
Bid and Award:	3 months
Construction:	18 months
Total:	36 months

Anticipated date for completion of Section 24 facilities is June 2010.

3.1.6 Projected Expenditures

A summary of the projected expenditures through FY 2016 (in FY 2006 dollars) for redirection of Acme Basin B discharges to the C-51 West Canal and STA-1E is presented in Table 3.4.

Table 3.4 Projected Expenditures, Acme Basin B Project

Fiscal Year	Scheduled Expenditure by Type (FY 2006 \$)						Fiscal Year Total (FY 2006 \$)
	Planning, Eng. & Design	Program & Const. Mgmt.	Construction & Interim Ops	Land Acquisition	Project Contingency	Incremental O&M Cost	
2006-2008	\$2,415,628	\$762,695	\$8,474,393	\$0	\$555,073	\$0	\$12,207,789
2009		\$928,245	\$19,063,761		\$1,027,163	\$500,000	\$21,519,169
2010						\$525,000	\$525,000
2011						\$551,250	\$551,250
2012						\$578,813	\$578,813
2013						\$607,753	\$607,753
2014						\$638,141	\$638,141
2015						\$670,048	\$670,048
2016						\$703,550	\$703,550
Total	\$2,415,628	\$1,690,940	\$27,538,154	\$0	\$1,582,236	\$4,774,555	\$38,001,513