SOUTH FLORIDA WATER MANAGEMENT DISTRICT

C-139 and Western Basins Best Management Practices (BMPs) Grant Program

April 2004

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EXECUTIVE SUMMARY

To advance water quality improvements achieved by implementing Best Management Practices (BMPs) under the Everglades Restoration Program, the District launched the C-139 and Western Basins Grant Program in 2002 in partnership with the Natural Resources Conservation Service (NRCS), and entered into contract with Hendry Soil and Water Conservation District (HSWCD) to administer the program. In 2004, the Florida Department of Agriculture and Consumer Services (FDACS) joined the District and NRCS by contributing funds to the program. The basis of the program is to provide grants, primarily to local landowners, to facilitate implementation of BMPs that ultimately reduce phosphorus discharges to the Everglades from farms in these basins. This report provides a summary of BMP projects sponsored by the C-139 and Western Basins BMP Grant Program since its inception.

By committing $1,793,230 to the grant program to date, the District has funded numerous BMP projects ranging from canal cleaning operations and installation of water control structures to construction of surface water reservoirs. As of December 2004, $828,983 has been awarded for implementation of BMP projects in the C-139 basin and $414,190 in the Feeder Canal basin. Administration costs have totaled $50,057. The remaining $500,000 will be awarded in future grant application cycles.

The District will continue to support voluntary BMP initiatives for water quality improvement by providing economic incentives to the farming communities in the C-139 and Western basins. The District is committed to allocating time, energy, and funds to projects that will result in expanding the body of knowledge in the area of farming BMPs, and will collaborate with the farming community and partnering agencies to ensure that water delivered to the Everglades meets mandated water quality standards.

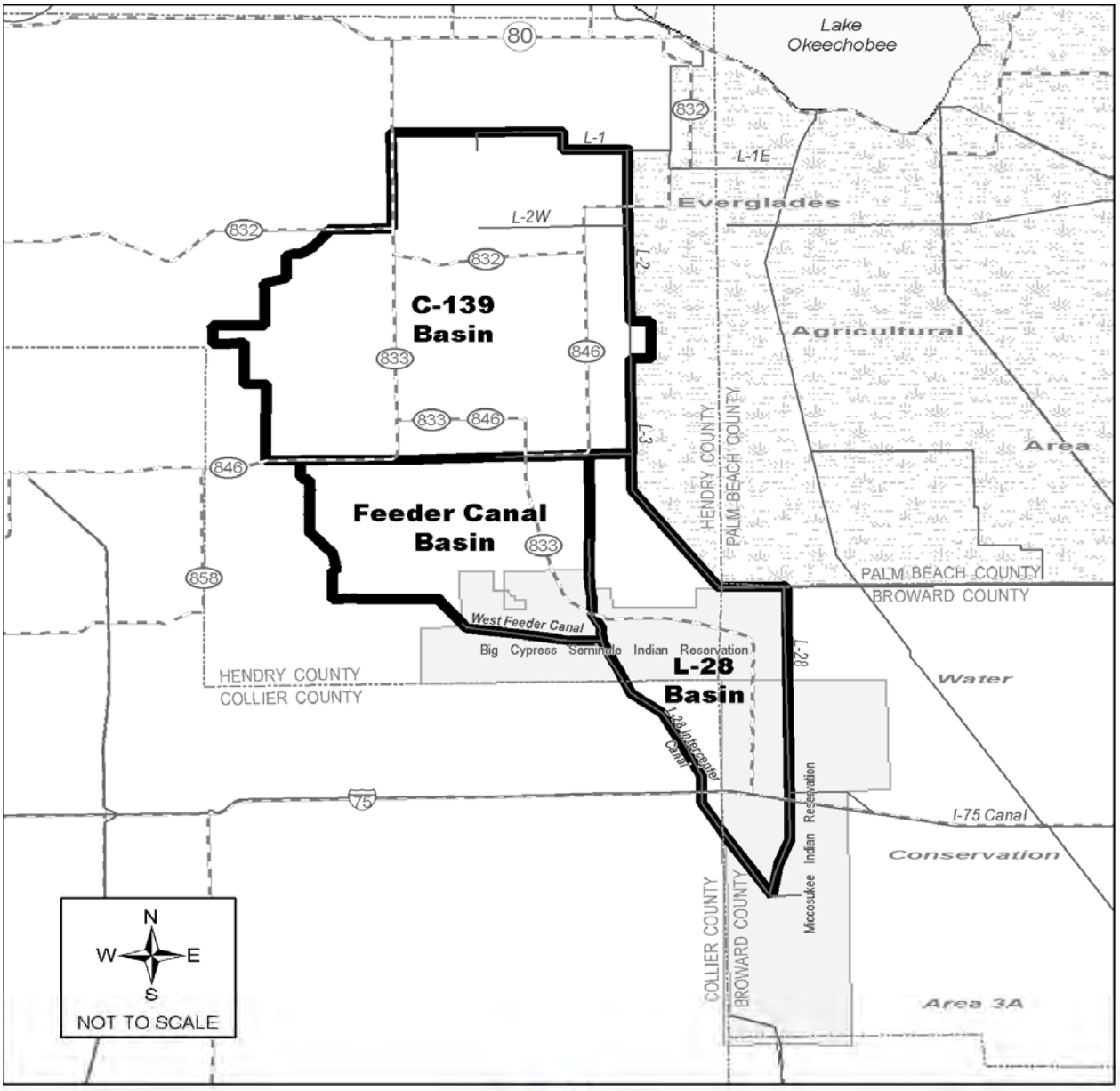
INTRODUCTION

In 2002, the C-139 and Western Basins Best Management Practices (BMP) Grant Program was created to advance implementation of BMPs for phosphorus reduction in agricultural discharges. Figure 1 shows the C-139 and Western Basins. For purposes of this report and this grant program, the Western Basins are the Feeder Canal and L-28 basins. These basins are comprised of mostly agricultural lands that are served by South Florida Water Management District (District) structures that discharge into the Everglades (aka Everglades Protection Area).

In 1994, the Everglades Forever Act (EFA) mandated the creation of the Everglades Program to achieve water quality standards in the Everglades. A major component of the program focuses on controlling phosphorus in discharges through a combination of BMPs in the tributary basins and Stormwater Treatment Areas (STAs). In 2003, the EFA was modified to incorporate the "Long-Term Plan for Achieving Water Goals in the Everglades Protection Area" (Long-Term Plan). The Long-Term Plan objective for the tributary basins is to further develop and strengthen BMP initiatives in these basins. Consistent with the EFA mandate, the C-139 and Western Basins BMP Grant Program builds upon the comprehensive approach of implementing source controls through regulatory, voluntary, and educational programs.

TRIBUTARY BASINS

The C-139 basin is included in the Everglades Construction Project (ECP) mandated by the EFA, which discharges to STAs. The Feeder Canal and the L-28 basins are considered non-ECP basins because they discharge to the Everglades directly through District structures but are not included in the ECP. The C-139 basin also differs from the Feeder Canal and L-28 basins in that the ECP requires a mandatory BMP Everglades Regulatory Program be implemented in the C-139 basin, while BMPs in the other non-ECP basins are voluntary. The Everglades Regulatory Program was created to carry out regulatory activities required by the EFA in the C-139 basin and oversee implementation of mandatory farm-level BMPs.



SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Environmental Resource Regulation Department
Everglades Regulation Division

Figure 1. C-139 and Western Basins Map

The EFA mandates that the goal for the C-139 basin is to maintain TP loads at or below historical baseline levels. Since the C-139 basin's initial compliance period in WY2003, this goal has not been met. The C-139 Basin is the second largest tributary source of phosphorus to the Everglades.

Voluntary BMP implementation in the Non-ECP basins is administered through the Everglades Stormwater Program (ESP). As part of the ESP Program, action plans have been developed for each basin, and include a combination of voluntary BMPs, requirement and/or modification of surface water permits to include water quality criteria, construction projects, and public education. Unlike the C-139 basin, which is required to maintain TP load at or below historical baseline levels, non-ECP basins do not have a specific phosphorus requirement established at the point of discharge. A summary of the characteristics of the tributary basins and water quality for Water Year 2004 (the period from May 1, 2003, to April 30, 2004) is presented below.

Table 1. Phosphorus (TP) Concentrations and Loads for Water Year 2004

Basin Name	Basin Category	Primary Land Use	TP Concentration (flow-weighted mean, ppb)	TP Load (metric tons)
C-139	ECP[1]	Agricultural	274	69.0
Feeder Canal	Non-ECP	Agricultural	99	14.4
L-28	Non-ECP	Agricultural	42	7

[1] ECP basin discharges receive further treatment downstream through the STAs prior to discharge to the EPA.

HISTORY OF THE GRANT PROGRAM

To advance the results achieved by the Everglades Regulatory Program, the District launched the C-139 and Western Basins Grant Program in 2002 through a contract with HSWCD to administer the program. The program provides funding to local landowners to facilitate implementation of BMPs that reduce phosphorus discharges from their farms. The Natural Resources Conservation Service (NRCS), under their Environmental Quality Incentive Program (EQIP), and the Florida Department of Agriculture and Consumer Services (FDACS) have partnered with the District to increase the funding of the program. The funds from all three agencies are administered by the Hendry Soil and Water Conservation District (HSWCD) through separate contracts.

Table 2 summarizes the various contracts executed and amounts committed during the life of the grant program. Because of the success of the program, the District increased the funding twice between 2002 and 2004, and the program was renewed under a separate contract in 2005.

Table 2. District Contributions to the Grant Program

Contract No.	Period	Contracted Amount $	How Distributed
C-13345	August 2002 – August 2005	300,000	$100,000 each year
C-13345-A01	January 2004 – August 2005	350,000	$350,000 for the remaining contract period
C-13345-A02	July 2004 – August 2005	250,000	$250,000 for the remaining contract period
OT050184	November 2004 – November 2007	900,000	$400,000 – December 2004 $500,000 – June 2005

Tables 3, 4, 5, and 6 provide a breakdown of the projects that were funded under each contract and amendment. Of the $1,793,230 total District contribution to the program, $828,983 is under contract between HSWCD and C-139 landowners and $414,190

between HSWCD and Feeder Canal basin landowners. HSWCD has been paid $50,057 to administer the program. The remaining $500,000 will be allocated in upcoming grant application cycles.

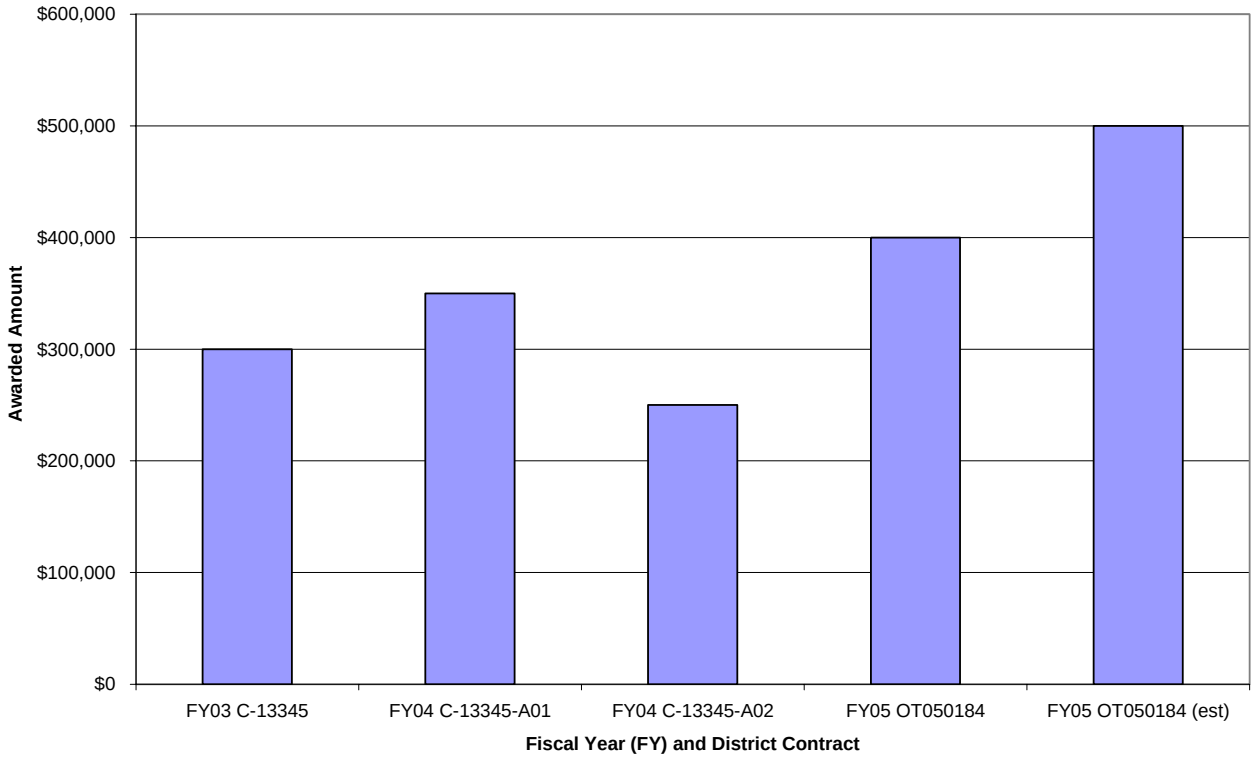


Figure 2. District Contributions to the Grant Program

APPLICATION AND GRANT AWARD PROCESS

The application process, eligibility criteria, cost-reimbursement process, and deadlines are described in a handbook prepared by the District and distributed to all interested parties. To evaluate applications and to select projects to be funded, a selection committee, composed of two District staff members and one member of each NRCS and FDACS, has been formed. The selection committee evaluates the proposed BMP implementation projects using the eligibility criteria defined in the handbook. Based on the information submitted by the applicant with respect to the project scope and cost, and on a fair and

equitable formula developed by the District, the HSWCD, and NRCS, the committee determines eligible costs to be funded by the program. The combined awards from the participating agencies vary based on the number of applicants and available funds, but have generally been about 80 percent of the total project cost.

Inspections are conducted regularly during the implementation phase to verify that BMPs are being implemented according to the approved conceptual plan and design, and to determine progress for reimbursement. These inspections and documentation of eligible expenses are the basis for cost reimbursement.

PROJECTS FUNDED BY THE GRANT PROGRAM

The grant program has funded numerous BMP projects to date, ranging from canal-cleaning operations and installation of water-control structures to construction of surface water reservoirs where discharges are routed before leaving the farm. The grant program has also funded a demonstration project to determine the role of sediments on phosphorus transport in the two canals that are primary discharge points from the C-139 basin, the Deer Fence and S&M Canals. The following sections describe the various contracts and amendments executed throughout the life of the program. The Appendix provides a detailed description of the demonstration project.

FY03 - Contract No. C-13345

During the first application cycle, only three eligible project applications were received and funded. Table 3 itemizes projects funded in 2003 under the original contract, including a description of the project, the amount that the District contributed, the amount of NRCS participation under EQIP, the total cost to the applicant or the portion to receive contribution-match credit, and the total project cost. All of the projects listed have been completed.

Table 3. Grants Awarded in FY03 under Original Contract C-13345[3]

GRANTEE AND PROJECT DESCRIPTION	BASIN	SFWMD $	EQIP[1] $	APPLICANT[2] $	TOTAL $
J-7 Ranch *Thirteen reservoirs to be completed in phases*	C-139	91,408	75,000	107,000	273,408
Howell Farms *Canal cleaning; culverts with risers - project forms the headwaters of the Lard Can Canal*	Feeder Canal	43,277	0	14,500	57,777
Toney Strand Regional BMP Project *Canal cleaning; culverts with risers*	Feeder Canal	49,538	0	16,500	66,038
HSWCD *Administration Fees*		10,000	0	0	10,000
TOTAL		**194,223**	**75,000**	**138,000**	**407,223**

[1] EQIP only funded one project due to the limited funds available during FY03. The project selected for EQIP funding was based on the location that would benefit the largest region.

[2] This column represents the sum of the invoices that the applicant provided in order to demonstrate their participation in the project. Frequently, the total applicant costs incurred are higher than the sum of the invoices submitted.

[3] Contract period is from August 2002 to July 2004.

FY04 - Phase I (Contract No. C-13345, Amendment A01)

There was a significant increase in program participation for this application cycle with eight projects being funded, as itemized in Table 4. As of the date of this report, all of the projects listed have been completed.

Table 4. Grants Awarded in FY04 Phase I

GRANTEE AND PROJECTDESCRIPTION	BASIN	SFWMD 75% $	APPLICANT[1] 25% $	TOTAL $
Zipperer Farms *Partial construction of reservoir; re-sized ditches to provide additional storage capacity*	C-139	50,900	17,000	67,900
Jackman Ranch *Partial construction of reservoir; culverts with risers*	C-139	47,450	15,817	63,267
Little Cypress Grove *Partial construction of reservoir (dikes)*	C-139	25,000	8,333	33,333
J-7 Ranch *Continue construction of 13 reservoirs*	C-139	78,580	26,193	104,773
Howell Farms *Culverts with risers*	Feeder Canal	9,014	3,000	12,014
Toney Strand Regional Project Ca*nal cleaning; culverts with risers*	Feeder Canal	87,900	29,300	117,200
Point of Cypress *Reservoir; culverts with risers*	Feeder Canal	73,044	24,348	97,392
McDaniels' Ranch *Construction of reservoir; culverts with risers*	Feeder Canal	68,756	22,920	91,676
HSWCD *Administration Fees*		8,928	0	8,928
TOTAL		**449,572**	**146,911**	**596,483**

[1] This column represents the sum of the invoices that the applicant provided in order to demonstrate their participation in the project. Frequently, the total applicant costs incurred are higher than the sum of the invoices submitted.

FY04 - Phase II (Contract No. C-13345, Amendment A02)

Eight projects were also funded during this application cycle, as itemized in Table 5. Four projects did not receive funding from NRCS or FDACS because applications were not submitted for those programs. As of the date of this report, the projects funded in this cycle are approximately 60 percent complete.

Table 5. Grants Awarded in FY04 Phase II

GRANTEE AND PROJECT DESCRIPTION	BASIN	SFWMD 23.4% $	EQIP 44% $	FDACS 12.5% $	APPLICANT[1] 20.1% $	TOTAL $
Zipperer Farms *Partial construction of reservoir, including control structures; re-sized ditches to provide additional storage capacity*	C-139	18,720	35,165	10,000	16,115	80,000
Jackman Ranch *Partial construction of reservoir; water control structures*	C-139	18,032	0	0	4,981	23,013
Little Cypress Grove *Partial construction of reservoir, including water control structure; culverts with risers*	C-139	43,120	0	0	11,910	55,030
J-7 Ranch *Continue construction of reservoirs*	C-139	35,100	65,934	37,500[2]	30,216	168,750
ABC Ranch *Culverts with risers*	C-139	11,699	21,978	6,250	10,073	50,000
McDaniels' Ranch *Construction of reservoir; culverts with risers*	Feeder Canal	40,950	76,923	9,615	35,252	162,740
Frank Smith *Canal cleaning; culverts with risers*	Feeder Canal	27,421	0	0	7,579	35,000
Demonstration Project – Clean Watershed Fund[3] *Evaluate the role of sediments in the Deer Fence S&M Canals*	C-139	50,000	0	0	0	50,000
HSWCD *Administration Fees*		5,000	0	0	0	5,000
TOTAL		**250,042**	**200,000**	**63,365**	**116,126**	**629,533**

[1] This column represents the sum of the invoices that the applicant provided in order to demonstrate their participation in the project. Frequently, the total applicant costs incurred are higher than the sum of the invoices submitted.

[2] An additional $18,750 was awarded to this project by FDACS for FY03.

[3] See the Appendix for a detailed description of this project.

FY05 – Phase I (Contract No. OT050184)

Seven projects were funded in this application cycle, as itemized on Table 6. Projects were funded at 77 percent of the estimated cost of the project. To date, all the contracts with landowners have been signed, and work has commenced on two of the projects.

Table 6. Grants Awarded in FY05 Phase I

GRANTEE AND PROJECTDESCRIPTION	BASIN	SFWMD 77% $	APPLICANT[1] 23% $	TOTAL $
Zipperer Farms *Partial construction of reservoir; re-sized ditches to provide additional storage capacity*	C-139	77,232	23,069	100,301
District-Recommended Project (100%)[2] *Sediment trap at bridge; canal cleaning*	C-139	22,000	0	22,000
Jackman Ranch *Partial construction of reservoir; culverts with risers*	C-139	71,163	21,257	92,420
Little Cypress Grove *Partial construction of reservoir (dikes); ditch cleaning*	C-139	37,545	11,215	48,760
J-7 Ranch *Continue construction of 13 reservoirs*	C-139	120,266	35,924	156,190
ABC Ranch Ca*nal cleaning; culverts with risers*	C-139	30,768	9,190	39,958
Howell Farms *Culverts with risers*	Feeder Canal	14,290	4,269	18,559
HSWCD *Administration Fees*		26,129	0	26,129
TOTAL		**399,393**	**104,924**	**504,317**

[1] This column represents the sum of the invoices that the applicant provided in order to demonstrate their participation in the project. Frequently, the total applicant costs incurred are higher than the sum of the invoices submitted.

[2] This project received additional funding (13 percent) per the handbook criteria. Projects recommended by District staff may receive additional funding, not to exceed 100 percent of implementation costs, based on water quality concerns (“hot spots”) identified through sampling at various locations in the C-139 basin between 1999 and 2003.

WATER QUALITY MONITORING

With only two effective years of BMP implementation within the C-139 basin, limited water quality data are available that may be used to evaluate the impact of the grant program on the phosphorus discharges from the C-139 and Western basins. To meet EFA mandates, phosphorus concentration and flow data are collected at the basin inflow and outflow points at District structures. However, limited water quality data are available within the basins themselves. For the C-139 basin, phosphorus concentrations have been measured at selected sampling locations within the basin by obtaining grab samples during discrete rainfall events. At this time, available data are insufficient to measure program success. Additional time and data are necessary before the District has an indicator of how the BMP grant program projects, concurrent with mandatory and voluntary initiatives, affect phosphorus levels in basin discharges.

In an effort to evaluate the effectiveness of specific grant funded BMPs, a long-term program to monitor farm-level water quality at the project is being developed and will be implemented in the second quarter of 2005. This information will serve to better prioritize future funding allocations and to identify areas that demand more effort. It is recognized that accurately quantifying the effectiveness of a BMP requires an intensive and scientifically defensible data gathering effort under controlled conditions. At this time in the life of the grant program, the time and cost associated with such an intensive water quality tracking effort may become prohibitive or unnecessary when considering the number of participating farms, the variability of site-specific conditions, external factors affecting BMP performance (e.g., weather), and changes in farming practices from year to year. The goal of the monitoring program therefore, is to qualitatively compare the trend of phosphorus concentrations in water quality discharges before BMPs are implemented with the trend after BMPs are implemented on a project-specific basis. This information will be used in conjunction with the results from BMP demonstration projects to refine the direction of the grant program for the future.

SUCCESS INDICATORS AND FUTURE DIRECTION

Farmers in the C-139 and Western basins have welcomed the support from the District to implement BMPs to improve water quality. Table 7 provides a comprehensive summary of projects that have been funded since inception of the program. To date, the District has shared in the cost to construct 12 reservoirs, 8 of which are complete and functional. The District has also shared in the cost to clean approximately 34 miles of canals and to replace 130 culverts with risers and mud boards. The risers control water levels on the farm and the mud boards trap the sediments, preventing them from discharging off-site. The District continues to visit the projects regularly to verify that BMPs are implemented according to the approved plans. Selected project pictures are shown on page 15.

The District will continue to support voluntary BMP initiatives for water quality improvement by providing economic incentives to the farming communities in the C-139 and Western basins. As more knowledge is acquired regarding BMPs, hydrologic information, and site-specific farming practices, the grant program will focus on those source controls that provide the most water quality benefit. The District will and will collaborate with the farming community and partnering agencies to ensure that water delivered to the Everglades meets mandated water quality standards. The District is committed to allocating time, energy, and funds to projects that will result in expanding the body of knowledge in the area of farming BMPs, such as demonstration projects, innovative projects, and outreach efforts.

Table 7. Projects Funded by the Grant Program from August 2002 to March 2005

GRANTEE AND PROJECT DESCRIPTION	BASIN	SFWMD $	EQIP $	FDACS $	APPLICANT[1] $	TOTAL $
Zipperer Farms *Partial construction of reservoir, including water control structures; re-sized ditches to provide additional storage capacity*	C-139	168,852	35,165	10,000	56,184	270,201
Jackman Ranch *Partial construction of reservoir; water control structures*	C-139	136,645	0	0	42,055	178,700
Little Cypress Grove *Partial construction of reservoir; water control structures; culverts with risers; ditch cleaning*	C-139	105,665	0	0	31,458	137,123
J-7 Ranch *Partial construction of thirteen reservoirs*	C-139	325,354	140,934	37,500	199,333	703,121
ABC Ranch *Culverts with risers; ditch cleaning*	C-139	42,467	21,978	6,250	19,263	89,958
Howell Farms *Culverts with risers*	Feeder Canal	66,581	0	0	21,769	88,350
Toney Strand Regional BMP Project *Canal cleaning; culverts with risers*	Feeder Canal	137,438	0	0	45,800	183,238
Point of Cypress *Reservoir; culverts with risers*	Feeder Canal	73,044	0	0	23,348	97,392
McDaniels' Ranch *Construction of reservoir; culverts with risers*	Feeder Canal	109,706	76,923	9,615	58,172	254,416
Frank Smith *Canal cleaning; culverts with risers*	Feeder Canal	27,421	0	0	7,579	35,000
Demonstration Project – Clean Watershed Fund *Evaluate the role of sediments in the Deer Fence S&M Canals*	C-139	50,000	0	0	0	50,000
HSWCD *Administration Fees*		50,057	0	0	0	50,057
TOTAL		**1,293,230**	**275,000**	**65,365**	**505,961**	**2,137,556**

[1] This column represents the sum of the invoices that the applicant provided in order to demonstrate their participation in the project. Frequently, the total applicant costs incurred are higher than the sum of the invoices submitted.


Completed reservoirs


Completed reservoir and dike construction in progress


Culverts with risers for water management and with mud boards for sediment control

Culvert delivery

Clean canals

Figure 3. Project Photos

QUESTIONS OR COMMENTS?

Your input is appreciated! Please contact Marta Edwards, Everglades Regulatory Program, South Florida Water Management District, at (561) 682-2928 with questions or comments.

APPENDIX – DEMONSTRATION PROJECT
PARTICULATE P AND THE SEDIMENTS IN THE C-139 BASIN CANALS

Demonstration projects to provide recommendations on how to more effectively implement BMPs are also supported by the grant program at both the individual farm level and in areas that have a potential impact on regional water quality compliance results. One such demonstration project was funded during the second amendment to Contract No. C-13345, and is currently being conducted. The primary objective of this investigation is to determine whether canal sediments are serving as sinks or sources of phosphorus, and thus contributing to, or reducing the overall export of phosphorus from the basin. The role of flow and hydraulic conveyance structures on the re-suspension and transport of phosphorus will also be determined. The study concentrates on the S&M and the Deer Fence Canals located at the southern boundary of the C-139 basin. The investigation will yield recommendations for canal management, including dredging, canal widening, canal operations, and other BMPs. The specific phases of this project include:

- review of all available water quality, sediment, and hydrologic data for all stations within the Deer Fence and S&M canals;
- preparation of a Sampling and Analysis Plan for collection of water quality and sediment samples at discrete locations within the Deer Fence and S&M Canals.
- collection of water quality and sediment samples at discrete locations within those canals during periods of flow and during quiescent periods;
- assessment of floating vegetation at sampling locations concurrent with water quality and sediment sampling; and ultimately,
- canal management recommendations.

The first and second tasks of the demonstration project, e.g., review of all available water quality, sediment and hydrologic data for all stations within the Deer Fence and S&M Canals and the preparation of a Sampling and Analysis Plan, have been completed to date. The final report should be completed by September 2005.