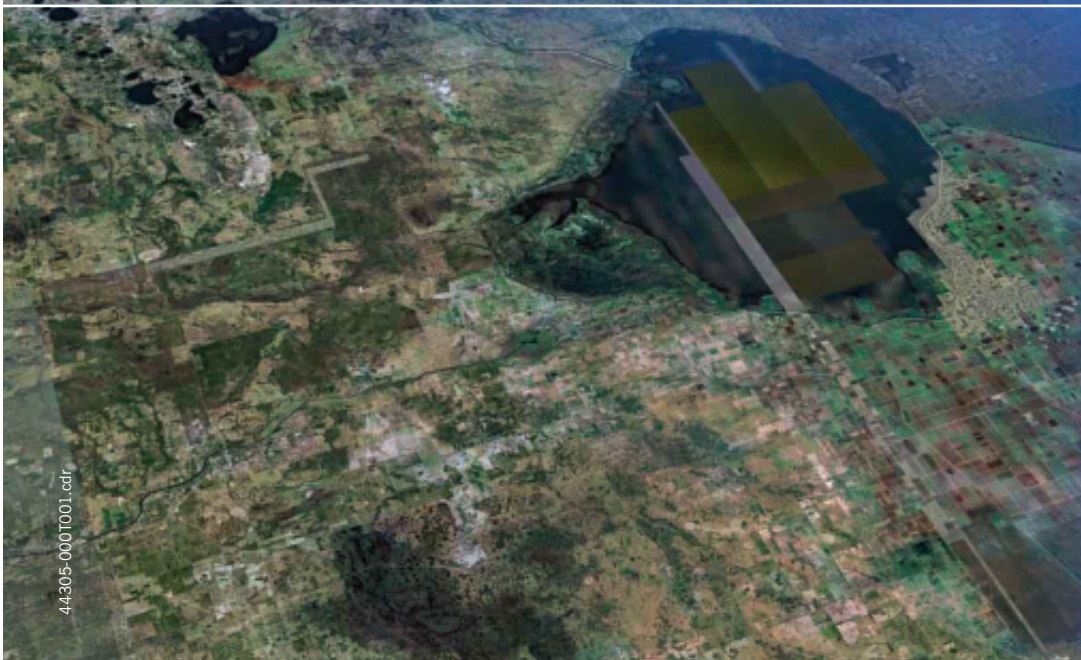




Statement of Estimated Regulatory Costs
Associated with Revisions to Chapter 40E-63,
Part IV, Everglades Regulatory Program:
Pollution Source Controls, C-139 Basin

Final

September 2010



HAZEN AND SAWYER
Environmental Engineers & Scientists

September 1, 2010

Ms. Ximena Pernet
Engineering Specialist 4
Environmental Resource Regulation Department
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
3301 Gun Club Road
West Palm Beach, Florida 33406

Statement of Estimated Regulatory Costs
for Revisions to C-139 Basin Rule –
FINAL PO4500046362

Dear Ms. Pernet:

We are pleased to submit the Statement of Estimated Regulatory Costs for revisions to the C-139 Basin Rule. As required by Section 120.541, Florida Statutes (2009), "A statement of estimated regulatory costs shall include:

- (a) A good faith estimate of the number of individuals and entities likely to be required to comply with the rule, together with a general description of the types of individuals likely to be affected by the rule.
- (b) A good faith estimate of the cost to the agency, and to any other state and local government entities, of implementing and enforcing the proposed rule, and any anticipated effect on state or local revenues.
- (c) A good faith estimate of the transactional costs likely to be incurred by individuals and entities, including local government entities, required to comply with the requirements of the rule. As used in this paragraph, "transactional costs" are direct costs that are readily ascertainable based upon standard business practices, and include filing fees, the cost of obtaining a license, the cost of equipment required to be installed or used or procedures required to be employed in complying with the rule, additional operating costs incurred, and the cost of monitoring and reporting.
- (d) An analysis of the impact on small businesses as defined by s. 288.703, and an analysis of the impact on small counties and small cities as defined by s. 120.52.
- (e) Any additional information that the agency determines may be useful.

*Ms. Ximena Pernet
September 1, 2010*

This SERC addresses these legal requirements using the best available information. The project team members were Grace Johns, Ph.D. as project manager and economist; and Del Bottcher, Ph.D., P.E., Agricultural Engineer and President of Soil and Water Engineering Technology, Inc. We thank Ximena Pernet and Carmela Bedregal of the District for assisting Hazen and Sawyer in preparing this SERC by providing relevant data and information and providing review comments and edits.

Very truly yours,

HAZEN AND SAWYER, P.C.

A handwritten signature in cursive script that reads "Grace Johns". The signature is written in dark ink and is positioned above the printed name and title.

Grace M. Johns, Ph.D.
Senior Associate and Economist

Enclosure

c: File No. 44305-000

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Executive Summary

This Statement of Estimated Regulatory Costs (SERC) follows the requirements of Section 120.541, Florida Statutes (2009) regarding proposed revisions to Chapter 40E-63, Part IV, “Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin”, F.A.C. These revisions are referred to in this SERC as the “proposed rule”.

1.0 Summary of Current Rule

The current rule implements requirements of the Everglades Forever Act (EFA), Sections 373.4592(4)(f)5. and 6., F.S., for the C-139 Basin, and also provides a regulatory process for landowners whose water management systems connect with and make use of the canals, structures and other Works of the District within the C-139 Basin, in accordance with Section 373.085, F.S. Under the EFA requirements, landowners within the C-139 Basin shall not collectively exceed an annual average loading of phosphorus based proportionately on the historical rainfall for the C-139 Basin over the period of October 1, 1978, to September 30, 1988. The C-139 Basin is located in northeast Hendry County, just southwest of Clewiston, Florida and Lake Okeechobee.

The primary rule requirement is that qualifying landowners, lessees or operators shall obtain District approval of a BMP (Best Management Practices) Plan as described in Part IV and its Appendix B1. Once the permit is approved, the permittee must implement this BMP Plan and submit to the District an annual report certifying that the BMPs were implemented. Permittees are subject to on-site verification of BMPs and review of detailed documentation of implementation as deemed appropriate by the District. The BMP Plan must include a description of records and documentation to be maintained on-site or at a suitable location that is readily available for District review. These documents must be sufficient to verify BMP implementation, maintenance, and training.

The current rule provides four levels of BMP implementation based on C-139 Basin compliance with phosphorus loading targets in three consecutive years and annual limits developed in accordance with the EFA. Therefore, the requirement for additional BMP implementation levels can occur on an annual basis if limits are exceeded. The current rule provides for a voluntary individual discharge monitoring program at the permit basin level. Permittees who elect to implement this voluntary program can require that compliance with their proportional share of the targets and limits be determined based on these data.

The first level of BMP implementation was required when the current rule was adopted in January 2002. Each successive level requires that permittees and applicants implement

additional BMPs each time the District determines that the C-139 Basin is out-of-compliance with the EFA. As of August 2005, all four BMP implementation levels were triggered such that each permittee must implement BMPs that equate to 35 BMP equivalent points as described in Appendix B1 of Chapter 40E-63, F.A.C.

In August 2006, the following provision under the current rule was triggered.

“If the C-139 Basin is determined to be “Out-of-compliance” a fourth time the District will notify all permittees via certified mail and initiate a rulemaking effort pursuant to Chapter 120, F.S. to establish a program to bring the C-139 Basin back into compliance. All Permit conditions will remain in effect and compliance monitoring will continue until the modified rule is adopted unless an administrative process under Chapter 120, F.S. indicates otherwise.”

2.0 Summary of Proposed Rule

The proposed changes to the current rule require that of the required 35 BMP equivalent points, a minimum of 20 BMP equivalent points shall meet the following criteria:

- (a) A minimum of 10 BMP equivalent points in nutrient control practices.
- (b) A minimum of 5 BMP equivalent points in water management practices.
- (c) A minimum of 5 BMP equivalent points in particulate matter and sediment control practices. Pasture management BMPs, as described in the Rule's Appendix B1, incorporated by reference in subsection 40E-63.435(1), F.A.C, can provide equivalent points towards this category, if applicable.

Permittees may propose Alternative BMP Plans that do not meet the above criteria. The Alternative BMP Plan provides an option when the minimum requirement of BMP points per category, as described above, may not be feasible. Alternative Plans shall demonstrate that the level of phosphorus reduction is, at a minimum, equivalent to the level provided by a plan meeting the above criteria. This is consistent with the Rule's definition of BMPs which is defined as “a practice or combination of practices determined by the District, in cooperation with the Department of Environmental Protection (Department) and FDACS, based on research, field testing, and expert review, to be the most effective and practicable on-location means, including economical and technological considerations, on-farm means of improving water quality in agricultural and urban discharges to a level that balances water quality improvements and agricultural productivity.”

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As a result, landowners, lessees or operators required to obtain a General Permit will need to submit to the District permit applications including BMP Plans consistent with the new requirements. The approved BMP Plan must be fully implemented within 90 days from the effective date of this proposed rule except under certain circumstances as described in the rule.

Each water year upon rule adoption, the District will determine if the C-139 Basin was in compliance with the EFA phosphorus loading requirements during the previous year using the proposed revised Appendix B2 titled “C-139 Basin Performance Measure Methodology”. The revised Appendix B2 is similar to the current Appendix B2 except that it incorporates improved methods for estimating targets and limits based on rainfall intensity and monthly distribution. The method included in the current rule does not consider rainfall distribution for estimating targets and limits.

If the District determines that the C-139 Basin is not in compliance, the District will review those permit basins that require remedial action or water quality improvement activities. A permit basin is “a parcel or group of parcels served by one or more discharge structures that collectively represent all of the discharge from that area of land. A permit may have one or more permit basins. The boundaries of a permit basin are determined by the District based on available hydrologic data to define, to the extent practicable, the land area discharging to each sub-basin.” The term “Water Quality Improvement Activities” is defined in the proposed rule as “a combination of modifications to a BMP Plan proposed by a permittee to meet the required total phosphorus reduction requirements of Appendix B3.2 (incorporated by reference in subsection 40E-63.446(2)(a), F.A.C.) Improvement activities may include revising implementation methods to increase the effectiveness of existing BMPs or implementing additional BMPs.”

Remedial action is not required if the permit basin is located in a sub-basin that does not exceed its proportional share of the basin-wide loading based on District-collected data for the sub-basin or, if applicable, based on data collected from the Permit Basin Discharge Monitoring Program. The method for this evaluation is described in the proposed new Appendix B3.1 titled “Permittee Annual Phosphorus Load Determination Based on Sub-basin Monitoring and Permit Basin Discharge Monitoring Program”. Additionally, remedial action is not required in permit basins where water quality improvement activities have already been implemented (early BMPs) or where demonstrated that additional water quality improvement activities are impracticable.

The proposed rule also provides incentives for voluntary permittee participation in research and demonstration projects which may account for no more than 20 BMP equivalent points as approved by the District. This provision is called the “Alternative BMP Demonstration Project” and is not included in the current rule.

When remedial action is required, the District will determine the unit area load that can be assigned to each permit basin. The “assigned unit area load” can be the sub-basin unit area load or the measured unit load at the permit basin, if the permittee volunteered or has been required to implement a discharge monitoring program. The District has established criteria to determine the assigned unit area load under different scenarios. The required total phosphorus reduction requirements for each of the permit basins is the difference between the assigned unit area load and the proportional share unit area load based on the required basin-wide levels.

The use of conditions when remedial action is not required such as the use of performance measures at the sub-basin level and the provision for a minimum of three years between compliance results that would require additional water quality improvement activities, are a departure from the current rule.

3.0 Other Proposed Changes to the Rule

The following are additional proposed changes to the current rule that were considered for this SERC.

- Under the current rule, there are three permit types: No Notice General, General, and Individual. Under the proposed rule, there are two permit types: No Notice General and General. The Individual permit type would be repealed. Activities that would require an Individual permit can be conducted under a General Permit under the proposed rule. Permit application fees for General permits are lower than those for Individual Permits. According to the District, there are no Individual Permits in the C-139 Basin.
- The current rule provides No Notice General Permits to owners of land parcels that are not subject to the Agricultural Privilege Tax pursuant to the EFA, Section 373.4592(7)(a), F.S. provided that the land is served by a properly permitted and operated surface water management system. Under the proposed rule, No Notice General Permits are provided to owners of land parcels that are not part of the common facilities of a water management system as defined in 40E-63.402(15), F.A.C., are inactive¹, or are less than 40 acres under common own-

¹ “Inactive” means “land parcels that are not used for agriculture, urban, commercial, industrial or other development, as determined by the District. It also includes lands in their undeveloped native state (unless used as pastures). Lands may be determined by the District as temporarily inactive if they are not operated or are vacant due to changes in ownership or land use. The District’s determination applies only to the requirement of this part of Chapter 40E-63, F.A.C.”

ership; and basic BMPs are implemented. All other land parcels would be required to apply for and maintain a General Permit. As a result of this proposed rule change, it is anticipated that three entities will need to apply for a General Permit under the proposed rule while others would no longer be required to obtain a General Permit. No Notice Permittees would need to implement basic BMPs.

- Some additional information from applicants and permittees will be required to be submitted to the District under the proposed rule.

All estimated impacts described in this SERC are those anticipated to occur where the proposed rule requires additional activities by individual and entities that are not required under the current rule or under other existing laws and rules.

4.0 Number of Individuals and Entities Required to Comply

Owners and operators of land whose water management systems connect with and make use of the canals, structures and other Works of the District within the C-139 Basin are required to comply with Chapter 40E-63, Part IV, "Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin" per Rule 40E-63.400(1), F.A.C. Permits granted by the District under this rule are called "C-139 Basin Pollutant Source Control Permits".

A summary of the estimated number of individuals and entities required to comply with the current rule and the proposed rule are provided in Table ES.1. Most of the General permittees are farmers and ranchers. Most of the No Notice Permittees are homeowners or owners of vacant residential land.

Table ES.1
Estimated Number of Individuals and Entities Required to Comply
With the Current and Proposed C-139 Basin Works of the District Rule

Permit Type	Current Rule		Proposed Rule	
	Number of Permits	Number of Landowners and Operators	Number of Permits	Number of Landowners and Operators
General Permits Required	40	71	29	58
No Notice General Permits	4,809	6,477	4,820	6,490
Total General and No Notice General Permits	4,849	6,548	4,849	6,548

General Permits. Under the current rule, about 71 landowners and operators associated with 40 permits are required to apply for and maintain General Permits in compliance with Chapter 40E-63, Part IV, “Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin”. Under the proposed rule, about 58 landowners and operators associated with 29 permits would be required to apply for and maintain General Permits.

No Notice General Permits. Under the current rule, about 6,477 landowners and operators associated with 4,809 permits are currently No Notice General Permits in compliance with Chapter 40E-63, F.A.C., Part IV, “Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin”. Under the proposed rule, about 6,490 landowners and operators associated with 4,820 permits would be granted No Notice General Permits.

5.0 Cost to the District and to Any Other State or Local Government Entity

The cost to the District includes any additional staff hours that would need to be spent to implement and enforce the proposed rule relative to the current rule. The annual cost increases the more frequently the C-139 Basin is determined by the District to be out of compliance. Under an out of compliance scenario, additional staff would be required to review applications for water quality improvement activities and verify implementation of those activities. The annual costs were estimated based on the assumption that this additional staff would be comprised of new employees. However, the District may redirect existing staff to provide the additional support needed. Assumptions were made to define a low- to high- cost scenario, as indicated below. The average annual cost presented includes employee salaries, the cost of employee benefits and District overhead.

1. If the C-139 Basin is never out of compliance, then the average annual cost is estimated to be \$73,000 associated with 0.29 full-time-equivalent staff.

2. If the C-139 Basin is determined by the District to be out of compliance once every 10 years, the average annual cost to the District is estimated to be \$88,000 associated with 0.34 full-time-equivalent staff.
3. If the C-139 Basin is determined by the District to be out of compliance three years out of ten, the highest out of compliance frequency possible, then the average annual cost is estimated to be \$116,600 associated with 0.46 full-time-equivalent staff.

The Central County Water Control District (CCWCD) and the State of Florida were identified as local and state entities that will be required to implement the proposed rule. The CCWCD will be required to obtain a General Permit for operation of the water management system serving Montura Ranches Estates. The State of Florida owns land within the C-139 Basin. In this case, if the lands are in conservation, a No Notice Permit may apply to those areas. If the lands are leased for agricultural operation, a General permit from the State or the lessee or operator may be required. Costs to the State and local government entities as applicants and permittees are addressed as transaction costs in Section 4.0 of this SERC. The proposed rule is not expected to affect State or local government revenues.

6.0 Transactional Costs

The information regarding Transactional Costs in this SERC incorporates the best available information to assess how the rule will impact the C-139 Basin Pollutant Source Control permittees and applicants. The estimated transactional costs associated with each proposed rule revision are provided and many were normalized to cost per acre averaged over the entire property. Applicants and permittees are encouraged to use their own situation and the information and unit costs provided in this SERC to obtain an understanding of how the proposed rule will impact their own operations.

Permittees who have judiciously implemented effective best management practices (BMPs) will be least impacted by the proposed rule in terms of transactional costs. In addition, many of the BMPs that permittees will be required to implement as a result of the proposed rule may already be required under other rules or fully or partially implemented as standard operating procedure for the agricultural operation.

The types of costs that may be incurred by the individuals and entities as a result of the proposed rule and the estimated Transactional Costs are as follows.

1. Costs by No Notice General Permittees to implement basic BMPs. These BMPs are not expected to incur significant costs to No Notice General permittees. Costs are likely to be zero or nominal.

2. Three entities who are currently No Notice General permittees will be required to apply for a General permit due to the change in requirements under the proposed rule. The permit application processing fee for a new permit is \$250. These entities may incur costs to prepare the permit application and to implement BMPs. The magnitude of these costs is not known but is expected to be similar to that incurred by other General Permittees. The estimated costs to implement BMPs are provided in Section 4.0 of this SERC, called Transactional Costs.
3. General Permittees may be required to submit additional information to the District. The costs incurred and the magnitude of these costs will depend on the specific conditions of each permittee. These costs are based on the time it may take to gather and submit the required information and are described as follows.
 - a. There is an estimated one time transactional cost ranging from \$0 to \$380 per applicant to submit a delineation of drainage features if these have changed from those currently in the permit, and a \$0 to \$190 per applicant transactional cost to submit to the District certifications that lessees have been notified of the requirements of the BMP Plan.
 - b. If the permittee applies phosphorus containing materials such as biosolids, the permittee may be required to implement a water quality monitoring program and submit water quality monitoring data. The estimated cost of instrumenting a water quality monitoring station for flow and concentration, and conducting monitoring in accordance with the standard requirements of the proposed rule is \$13,150 per monitoring station per year, including annualized capital and O&M cost. At a minimum, there would be one water quality monitoring station per permit basin.
4. Costs to General Permittees to revise their BMP Plan so that it complies with the allocation of 20 of the 35 BMP points to nutrient control practices (10 BMP points), water management practices (5 BMP points), and particulate matter and sediment control practices and/or pasture management BMPs, as applicable (5 BMP points). The District reviewed the currently permitted BMP Plans in the C-139 Basin and BMP inspection reports and data to determine the BMPs that are likely implemented but not claimed for BMP credit under the current permit. The District concluded that some of these BMPs may already be implemented in some of the permit basins but not documented, and that some BMPs may be partially implemented. Examples of partial implementation are described below:
 - Control discharge structures exist to provide water management detention. However, there is no assurance that water table levels are followed to optimize runoff storage and reduce total phosphorus loading in discharges.

- Soil tests are being conducted to determine the phosphorus nutrients in the soil. However, there is no assurance that standard phosphorus application recommendations are used or that there is technical documentation to justify that any deviations from those recommendations do not result in excess application of phosphorus fertilizers.

The District determined certain assumptions establishing a low- to a conservative high-cost range scenario based on best professional judgment and the post permit compliance data described above. These estimated costs per acre, the additional BMPs, and the acres associated with these additional BMPs are provided in Table ES.2.

The total estimated cost across the entire C-139 Basin to implement the additional BMPs, as required under the proposed rule, ranges from \$69,000 per year to \$576,000 per year. The actual cost is expected to be within this range and will depend on the extent to which the farms and ranches in the C-139 Basin are already implementing the additional required BMPs either to comply with other rules or as standard operating procedure. Basin-wide, the average additional cost per acre per year ranges from \$0.57 to \$4.77.

Table ES.2
Estimated Costs to Implement Additional BMPs That May Be Required
By General Permittees At Permit Renewal After Proposed Rule Adopted

Land Use	Additional BMPs Identified	Cost per Acre	Acres in Land Use - Current General Permits	Acres Affected by Additional Cost		Total Cost Range	
				Low End	High End	Low End	High End
Pasture	Water Resources Management for Pasture	\$1.17	72,944	0	24,072	\$0	\$28,050
	Sub-total Pasture					\$0	\$28,050
Sugarcane	Nutrient Application Control	\$0.00	4,152	0	0	\$0	\$0
	Nutrient Spill Prevention	\$0.00				\$0	\$0
	Nutrient Application Based on Soil Testing	\$0.00				\$0	\$0
	Sub-total Sugarcane					\$0	\$0
Citrus Groves	Nutrient Application Control	\$6.11	15,559	0	7,780	\$0	\$47,494
	Nutrient Spill Prevention	\$0.55				\$0	\$4,279
	Nutrient Application Based on Soil Testing	\$0.00				\$0	\$0
	Particulate Matter and Sediment Controls	\$8.48				\$0	\$65,970
	Sub-total Citrus Groves					\$0	\$117,743
Vegetables	Nutrient Application Control	\$6.11	28,169	5,634	22,535	\$34,423	\$137,690
	Nutrient Spill Prevention	\$0.55				\$3,099	\$12,394
	Nutrient Application Based on Soil Testing	\$5.50				\$30,986	\$123,944
	Particulate Matter and Sediment Controls	\$6.92				\$0	\$155,944
	Sub-total Vegetables					\$68,507	\$429,972
TOTAL			120,824	5,634	54,386	\$68,507	\$575,764
Average Cost per Acre						\$0.57	\$4.77

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5. In the event that the District determines that the C-139 Basin is out of compliance, permittees may incur costs to develop a plan of proposed water quality improvement activities and implement these activities. The magnitude of cost will depend on the percent total phosphorus reduction, if any, required from each permit basin. The first year when a compliance assessment can trigger water quality improvement activities is water year 2013. Additional water quality improvement activities after 2013 would be required no more frequently than every three years. The estimated costs of BMPs that might be included as an activity are provided in Section 4.0 of this SERC, called Transactional Costs.
6. The cost to develop and implement a verification plan that is “a water quality monitoring program to verify the expected effectiveness of a BMP Plan or proposed water quality improvement activities in accordance with Rule 40E-63.461(4), F.A.C.” This verification plan would be required if the permittee is unable to demonstrate that the required total phosphorus reductions can be achieved based on data from the most current representative technical references including peer reviewed or published BMP research and demonstration projects, with consideration of permit basin specific conditions such as when a site-assessment is completed pursuant to 40E-63.437(2). The verification plan will need to be implemented for a period not to exceed three water years. The estimated cost to prepare and implement a verification plan is approximately \$11,000 of capital costs and \$10,000 of annual operating costs for one discharge monitoring station. This cost includes plan development and discharge water quality sampling and quantity monitoring and reporting consistent with Appendix B of the District’s Guidebook for Preparing an Application for a C-139 Basin Pollutant Source Control Permit.
7. Cost to develop and implement a Permit Basin Discharge Monitoring Program if required by the District pursuant to 40E-63.437, 40E-63.438, and 40E-63.444(1)(r). The associated cost is estimated to be similar to the cost described in the previous paragraph under a verification plan.
8. Cost to demonstrate that water quality improvement activities are impracticable, including the cost of a discharge monitoring plan, to those individuals and entities who elect to utilize this option. This option is a potential cost-saving benefit to permittees and applicants.

The requirement that all General permittees in the C-139 Basin renew their permits within 30 days of the effective date of this proposed rule will not incur costs to these permittees relative to the current rule. This is because they were automatically granted permit

extensions in 2007 in order to postpone permit renewal until this proposed rule is adopted.

7.0 Impacts to Small Businesses, Small Cities and Small Counties

The proposed rule is not expected to incur costs to small businesses, small cities and small counties unless the business, city or county owns, leases or operates on properties where water management systems connect to and make use of the canals, structures, and other Works of the District within the C-139 Basin. There are no small cities which are required to comply with the proposed rule. While Hendry County is a small county, it does not own or operate property that would require a General Permit. It is not known how many of the General and No Notice General permittees are small businesses because publicly available information regarding the size of businesses in this small geographic area could not be located. The estimated transactional costs associated with the proposed rule are provided in Section 4.0 of this SERC.

Section 1.0

Summary of Proposed Rule Revision

This Section summarizes the proposed revisions to Chapter 40E-63, Part IV, “Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin”. This summary reflects the August 24, 2010 version of the proposed rule revisions, including Appendix B, the application Form 1045 and the associated Guidebook. The difference in this proposed rule versus the current rule is the basis for addressing the requirements of the SERC.

1.1 Current Rule Regarding Implementation of Best Management Practices (BMPs)

Part IV of Chapter 40E-63, F.A.C. (Part IV) implements requirements of the Everglades Forever Act (EFA), Sections 373.4592(4)(f)5. and 6., F.S., for the C-139 Basin, and also provides a regulatory process for landowners whose water management systems connect with and make use of the canals, structures¹ and other Works of the District within the C-139 Basin, in accordance with Section 373.085, F.S.

According to the Everglades Forever Act (EFA), sec. 373.4592(4)(f)5 and 6, F.S.:

“5. Effective immediately, landowners within the C-139 Basin shall not collectively exceed an annual average loading of phosphorus based proportionately on the historical rainfall for the C-139 Basin over the period of October 1, 1978, to September 30, 1988. New surface inflows shall not increase the annual average loading of phosphorus stated above. Provided that the C-139 Basin does not exceed this annual average loading, all landowners within the Basin shall be in compliance for that year. Compliance determinations for individual landowners within the C-139 Basin for remedial action, if the Basin is determined by the district to be out of compliance for that year, shall be based on the landowners' proportional share of the total phosphorus loading. The total phosphorus discharge load shall be determined as set forth in Appendix B2 of Rule 40E-63, Everglades Program, Florida Administrative Code.

¹ "Structure" means “a structural device or hydrologic feature (e.g. pump, culvert, open connection, land surface grading, ditch) that water flows through or across and is ultimately discharged/directed from a Permit Basin to a receiving water body”.

6. The district, in cooperation with the department, shall develop and implement a water quality monitoring program to evaluate the quality of the discharge from the C-139 Basin. Upon determination by the department or the district that the C-139 Basin is exceeding any presently existing water quality standards, the district shall require landowners within the C-139 Basin to implement BMPs appropriate to the land uses within the C-139 Basin consistent with subparagraph 2. Thereafter, the provisions of subparagraphs 2.-4. shall apply to the landowners within the C-139 Basin.”

According to current rule, all lands within the C-139 Basin are users of the Works of the District within the C-139 Basin, unless expressly exempted, and must be granted a No Notice General Permit or must obtain a General or Individual Permit. The rule applies to existing and new water discharges within the C-139 Basin.

Since water quality monitoring data from the C-139 Basin demonstrates that the landowners within the C-139 Basin have collectively exceeded historical annual phosphorus loading levels, landowners are required to implement a best management practices (BMP) program for reduction of phosphorus in discharges that is consistent with the land uses within the Basin.

The primary rule requirement is that qualifying landowners, lessees or operators shall obtain District approval of a BMP (Best Management Practices) Plan as described in Part IV and its Appendix B1. Once the permit is approved, the permittee must implement this BMP Plan and submit to the District an annual report certifying that the BMPs were implemented. Permittees are subject to on-site verification of BMPs and review of detailed documentation of implementation as deemed appropriate by the District. The BMP Plan must include a description of records and documentation to be maintained on-site or at a suitable location that is readily available for District review. These documents must be sufficient to verify BMP implementation, maintenance, and training.

The current rule provides four levels of BMP implementation based on C-139 Basin compliance with phosphorus loading targets in three consecutive years and annual limits developed in accordance with the EFA. Therefore, the requirement for additional BMP implementation levels can occur on an annual basis if limits are exceeded. The current rule provides for a voluntary individual discharge monitoring program at the permit basin. Permittees who elect to implement this voluntary program can require that their compliance with their proportional share of the targets and limits be determined from the data collected through this discharge monitoring program.

The first level of BMP implementation was required when the current rule was adopted in January 2002. Each successive level requires that permittees and applicants implement

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additional BMPs each time the District determines that the C-139 Basin is out-of-compliance with the EFA. As of August 2005, all four BMP implementation levels were triggered such that each permittee must implement BMPs that equate to 35 BMP equivalent points as described in Appendix B1 of Chapter 40E-63, F.A.C.

In August 2006, the following provision under the current rule was triggered.

“If the C-139 Basin is determined to be “Out-of-compliance” a fourth time the District will notify all permittees via certified mail and initiate a rulemaking effort pursuant to Chapter 120, F.S. to establish a program to bring the C-139 Basin back into compliance. All Permit conditions will remain in effect and compliance monitoring will continue until the modified rule is adopted unless an administrative process under Chapter 120, F.S. indicates otherwise.”

1.2 Proposed Changes to Current Rule Regarding BMP Implementation

According to the proposed rule, the “C-139 Basin” means “those lands described in the EFA, Section 373.4592(16), F.S. or lands outside those boundaries which discharge to the C-139 Basin or to the canals or structures described in Rule 40E-63.401(1), F.A.C.” The addition of “lands outside those boundaries” as used in the sentence above is a proposed change to current rule.

The proposed changes to current rule require that existing permittees in the C-139 Basin renew their permits within 30 days from the effective date of this proposed rule and, at that time, modify their BMP Plan such that the following requirement is met.

Of the 35 BMP equivalent points, a minimum of 20 BMP equivalent points shall meet the following criteria:

- (a) A minimum of 10 BMP equivalent points in nutrient control practices².
- (b) A minimum of 5 BMP equivalent points in water management practices³,

² “Nutrient Control Practices” means “a category of BMPs that minimizes nutrient input and the movement of nutrients off-site by efficient and controlled application of nutrients (e.g., organic and chemical fertilizers, soil amendments, and residuals.)”

³ “Water Management Practices” means “a category of BMPs that minimizes the quantity and improves the quality of off-site discharges which carry nutrients downstream. BMPs for water management include discharge and irrigation management practices to reduce runoff”.

- (c) A minimum of 5 BMP equivalent points in particulate matter and sediment control practices⁴. Pasture management BMPs, as described in the Rule's Appendix B1, incorporated by reference in subsection 40E-63.435(1), F.A.C., can provide equivalent points towards this category, if applicable.

A "Best Management Practice (BMP)" means "a practice or combination of practices determined by the District, in cooperation with the Department of Environmental Protection (Department) and FDACS, based on research, field testing, and expert review, to be the most effective and practicable on-location means, including economical and technological considerations, on-farm means of improving water quality in agricultural and urban discharges to a level that balances water quality improvements and agricultural productivity." A "BMP Plan" means a combination of BMPs that meets, but is not limited to, the requirements of Rule 40E-63.435 and Rule 40E-63.437, F.A.C., as determined by the District.

A "BMP Equivalent Point" means the numerical value assigned to a BMP as provided in Appendix B1, incorporated by reference in subsection 40E-63.435(1), F.A.C. The points are used for regulatory permit review to ensure a comparable level of effort in BMP implementation among permittees. The points are an indication of relative BMP effectiveness. The points are based on expert review, technical publications, best professional judgment, and cooperative workshops with stakeholders.

Requirements of each BMP and BMP equivalent points are provided in Appendix B1 (incorporated by reference in subsection 40E-63.435(1), F.A.C.). The BMPs and point system described in Appendix B1 are unchanged from current rule except that eight BMP descriptions were added and the point score for "No Nutrients Imported Via Direct Land Application" was increased from 15 to 20. The new BMP descriptions provide clarification on practices that can be implemented which were included under other BMPs in the current rule, or rewording of the BMP for clarity. The additions are five water management practices BMPs.

The revisions to the water management practices BMPs are:

- (1) The original "No direct discharge" (15 BMP points), which required overland sheet flow over the entire property and no direct point discharge, was separated into two

⁴ "Particulate Matter and Sediment Control Practices" means a category of BMPs that minimizes the movement off-site of nutrients in particulate matter and sediments by controlling the amount of eroded soil and plant matter in discharges.

BMPs under the proposed amendments: “Overland sheet flow over entire property” (15 BMP Points), and “No Point Discharge of Surface Water” (15 points),

(2) The original “Reduced Flow through Water Table Management” (5 points), which required decreasing discharge by optimizing drainage and irrigation schedules and/or by using low volume irrigation methods, was separated into three BMPs under the proposed amendments:

- “Low Volume Irrigation” (5 points),
- “Precision Irrigation Scheduling” (10 points), requiring “Low Volume Irrigation”, and use of soil moisture measuring equipment and irrigation decision tools, and
- “Tail water recovery system” (10 points), as part of a planned irrigation system in which facilities are installed and operated to collect and transport irrigation tailwater and/or runoff that would have been discharged offsite without the system,

(3) The original detention BMPs (1/2-inch or 1-inch level) were supplemented with the proposed “Water resources management for pastures” to clarify implementation methods in pasture areas where water control structures may not be used.

The approved BMP Plan must be fully implemented with 90 days from the effective date of this proposed rule except under certain circumstances as described in the rule.

Each water year upon rule adoption, the District will determine if the C-139 Basin was in compliance with the EFA phosphorus loading requirements during the previous year using the proposed revised Appendix B2 titled “C-139 Basin Performance Measure Methodology”. The revised Appendix B2 is similar to the current Appendix B2 except that it incorporates improved methods for estimating targets and limits based on rainfall intensity and monthly distribution. The method included in the current rule does not consider rainfall distribution for estimating targets and limits.

If the District determines that the C-139 Basin is not in compliance, water quality improvement activities⁵ will be required for permit basins⁶ except in the following situations:

- The permit basin is located in a sub-basin that is determined to not exceed its proportional share of the basin-wide loading based on District-collected data for the sub-basin or, if applicable, its Permit Basin Discharge Monitoring Program results are determined not to exceed the proportional share in accordance with Appendix B3.1, Permittee Annual Phosphorus Load Determination Based on Sub-basin Monitoring and the Permit Basin Discharge Monitoring Program”, and “Appendix B3.2, Criteria for Required Phosphorus Reductions”.
- District approved early BMPs, as described in subsection 40E-63.438(1)(a), F.A.C., were fully implemented in the permit basin during a water year that was used to deem the C-139 Basin out of compliance (this provision applies only to the parcels where the early BMPs apply),
- A District approved demonstration project including a verification plan, as described in subsection 40E-63.438(1)(b), F.A.C., was conducted within the permit basin during a water year that was used to deem the basin out of compliance (this provision applies only to the land uses or crops to which the project applies).
- The permit basin, or portion thereof, has been issued and meets the conditions of a determination of impracticability as described in subsection 40E-63.461(6), F.A.C.
- The performance measure determination includes the permit basin UAL from either of the two water years immediately following a water year for which the permit basin was required to implement water quality improvement activities.

For sub-basins that exceed their proportional share of the phosphorus load, the District will determine the assigned unit area load. The assigned unit area load can be the sub-

⁵ “Water Quality Improvement Activities “ means a combination of modifications to a BMP Plan proposed by a permittee to meet the required total phosphorus reduction requirements of Appendix B3.2 (incorporated by reference in subsection 40E-63.446(2)(a), F.A.C.)

⁶ Permit Basin “means a parcel or group of parcels served by one or more discharge structures that collectively represent all of the discharge from that area of land. A permit may have one or more permit basins. The boundaries of a permit basin are determined by the District based on available hydrologic data to define, to the extent practicable, the land area discharging to each sub-basin.

basin unit area load or the measured unit load at the permit basin if the permittee volunteered or has been required to implement a discharge monitoring program. The District has established criteria to determine the assigned unit area load under different scenarios. The required total phosphorus reduction requirements for each of the permit basins is the difference between the assigned unit area load and the proportional share unit area load based on the required basin-wide levels.

In order to achieve the required total phosphorus reduction requirements, permittees will need to implement Water Quality Improvement Activities. The first year that can result in additional activities after an out-of-compliance determination is water year 2013. Additional water quality improvement activities after 2013 can be required no more frequently than every three years.

The use of conditions when remedial action is not required such as the use of performance measures at the sub-basin level and the provision for a minimum of three years between compliance results that would require additional water quality improvement activities are a departure from the current rule.

The District will provide written notice to permittees regarding the C-139 Basin compliance results. These results will be obtained from the District's implementation of the:

- (1) C-139 Basin procedures described in Appendix B2, and;
- (2) Sub-basin and permit basin performance procedures described in Appendix B3.1.

The notice will also include whether water quality improvement activities are required of the permittee. The District shall transmit the written notices no later than August of each year. The notices shall describe permittees' required actions for proposing water quality improvement activities based on these assessments.

If the C-139 Basin is determined to be out-of-compliance with the water quality requirements of Part IV pursuant to 40E-63.461, F.A.C., the permittee shall propose water quality improvement activities as follows.

- (a) The permittee shall submit a letter modification application for the District's consideration, within 120 days of the District's transmittal of the notice that the C-139 Basin is not in compliance. The submittal shall include the section entitled "Water Quality Improvement Activities" of Form 1045.
- (b) The submittal shall include a proposal for water quality improvement activities along with the estimated phosphorus reductions to be achieved in accordance with 40E-

63.461(3), F.A.C., or a verification plan in accordance with 40E-63.461(4), F.A.C. The phosphorus reductions shall be the minimum levels necessary to meet the permit basin's proportional share of required total phosphorus reductions as determined by the District (Appendices B3.1 and B3.2, incorporated by reference in subsection 40E-63.446(2)(a), F.A.C.). The proposal shall include a schedule to ensure that full implementation of an approved BMP Plan incorporating any proposed water quality improvement activities is in effect as soon as feasible and no later than April 30 following the District's transmittal of the notice that the C-139 Basin is not in compliance, unless otherwise approved by the District. An alternate implementation schedule may be approved by the District with based on the scope of the proposed activities. A permittee shall be required to implement intermediate water quality improvement activities or BMPs, as applicable, if an alternate implementation schedule is approved.

1.3 Determination of C-139 Basin Compliance and Required Total Phosphorus Reduction Level for Permit Basins

The proposed Appendix B2 "C-139 Basin Performance Measure Methodology" sets forth the method for determining whether the C-139 Basin is in compliance with the EFA by assessing whether phosphorus discharges from the C-139 Basin are maintained at or below a certain threshold. This threshold is the collective average annual phosphorus load based proportionally on the historical rainfall during the baseline period of October 1, 1978 through September 30, 1988. The determination requires annual calculation of the phosphorus load leaving the outfall structures from the C-139 Basin.

Load is the amount of phosphorus carried past a monitoring point by the movement of water. The average annual base period phosphorus load was 38.2 metric tons. The "Target" load is the predicted total phosphorus load that represents the baseline period using rainfall conditions in the year when compliance is being evaluated. The "Limit" load is the upper 90 percent confidence limit for the "Target" load. Evaluation of the C-139 Basin for phosphorus load performance will be based upon the following:

1. If the actual measured phosphorus load from the C-139 Basin in a post-baseline May 1 through April 30 period is less than the model phosphorus load estimate (target), then the C-139 Basin will be determined to meet its performance measure, that is, it will not have exceeded the collective average annual phosphorus loading that would have occurred during the baseline period adjusted for hydrologic variability.
2. The performance determination will be suspended if the adjusted rainfall for the May 1 through April 30 water year is outside the range of 27.97 inches to 66.21 inches and the actual measured phosphorus loading exceeds the target in any May 1 through April 30 period. Any period(s) for which the performance determination is suspended will be excluded from the calculation of the three-year average annual

phosphorus load, and will be excluded from the determination of whether the target has been exceeded in three or more consecutive May 1 through April 30 periods.

3. If the actual measured phosphorus loading from the C-139 Basin exceeds the model phosphorus load estimate (target) in three or more May 1 through April 30 periods, and if not suspended due to rainfall, then the C-139 Basin will be determined to exceed its performance measure, that is, it will have exceeded the collective average annual phosphorus loading that would have occurred during the baseline period adjusted for hydrologic variability.
4. If the actual measure phosphorus loading from the C-139 Basin exceeds the upper 90% confidence level of the target (herein after referred to as the limit), in any May 1 through April 30 period, and if not suspended due to rainfall, the C-139 Basin will be determined to exceed its performance measure, that is, it will have exceeded the collective average annual phosphorus loading that would have occurred during the baseline period adjusted for hydrologic variability.
5. The target, limit and adjusted rainfall will be calculated according to the following equations and explanation:

$$\text{Target} = \exp (-17.0124 + 4.5995 X + 3.9111 C - 1.0055 S)$$

$$\text{Explained Variance} = 74.2\%, \text{ Standard Error of Estimate} = 0.5440$$

Predictors (X, C, S) are calculated from the first three moments (m_1, m_2, m_3) of the 12 monthly rainfall totals (r_i , $i=1$ to 12, inches) for the current year:

$$m_1 = \text{Sum} [r_i] / 12$$

$$m_2 = \text{Sum} [r_i - m_1]^2 / 12$$

$$m_3 = \text{Sum} [r_i - m_1]^3 / 12$$

$$X = \ln (12 m_1)$$

$$C = [(12/11) m_2]^{0.5} / m_1$$

$$S = (12/11) m_3 / m_2^{1.5}$$

$$\text{Limit} = \text{Target} \exp (1.440 \text{ SE})$$

$$\text{SE} = \text{standard error of predicted } \ln(L) \text{ for May-April interval}$$

$$\begin{aligned} \text{SE} = & 0.5440 [1 + 1/10 + 4.8500 (X-X_m)^2 + 8.1932 (C-C_m)^2 + \\ & 0.9247 (S-S_m)^2 + 4.5950 (X-X_m) (C-C_m) - \\ & 0.3624 (X-X_m) (S-S_m) - 4.0048 (C-C_m) (S-S_m)]^{0.5} \end{aligned}$$

$$\text{Adjusted Rainfall} = \exp [X + 0.8503 (C - C_m) - 0.2186 (S - S_m)]$$

Where :

Target = predicted load for future rainfall conditions (metric tons/yr)

Limit = upper 90% confidence limit for Target (metric tons/yr)

Adjusted Rainfall = equivalent rainfall for mean C and S variables (inches)

X = the natural logarithm of the 12-month total rainfall (inches)

C = coefficient of variation calculated from 12 monthly rainfall totals

S = skewness coefficient calculated from 12 monthly rainfall totals

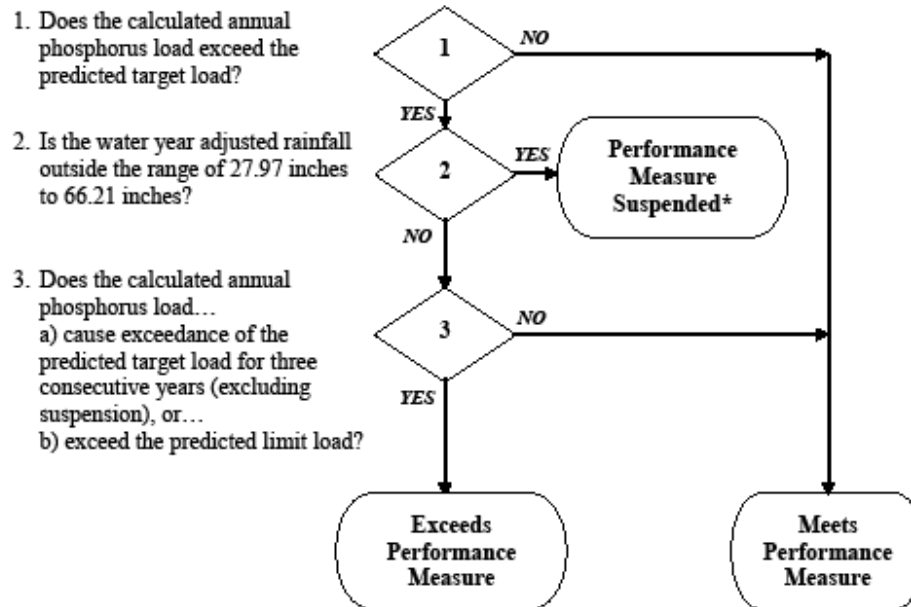
X_m = average value of the predictor in calibration period = 3.8434

C_m = average value of the predictor in calibration period = 0.9087

S_m = average value of the predictor in calibration period = 0.8200

The first predictor (X) indicates that load increases exponentially with total annual rainfall. The second and third predictors (C & S) indicate that the load resulting from a given annual rainfall is higher when the distribution of monthly rainfall has higher variance or lower skewness. For a given annual rainfall, the lowest load occurs when rainfall is evenly distributed across months and the highest load occurs when all of the rain falls in one month. Real cases fall in between. This process is illustrated in the flow chart provided in Figure B-3 of Appendix B2 and is reproduced on the next page.

Figure B-3
Flowchart – C-139 Basin Annual Performance Determination



* If the target is exceeded in a May 1 through April 30 period, and the District determines that the adjusted rainfall for the period is outside the range of 27.97 inches to 66.21 inches, the target and limit will be suspended and the C-139 Basin will not be determined to exceed its performance measure for that period only. Any period(s) for which the target and limit is suspended will be excluded from the determination of whether the target has been exceeded in three or more consecutive May 1 through April 30 periods. That is, the C-139 Basin will exceed its performance measure when the target is exceeded for three May 1 through April 30 periods, without an intervening May 1 through April 30 period in which the C-139 Basin has been determined to meet its performance measure, even though the three periods may be interrupted by periods of suspension.

In the event that the C-139 Basin is out of compliance, the requirements for permittees to implement water quality improvement activities will be based on the permittee's proportional share of phosphorus loading. This proportional share is calculated using the method described in the proposed Appendix B3.1, "Permittee Annual Phosphorus Load Determination Based on Sub-basin Monitoring and Permit Basin Discharge Monitoring Program". This Appendix establishes the procedures for calculating the actual phosphorus unit area load (Actual UAL) for sub-basins and monitored permit basins and their corresponding proportional share of phosphorus unit area load (Proportional share UAL). These measures will be calculated each water year as follows.

"Assigned (assigned UAL)" is the phosphorus load per unit acre (lbs/acre) assigned to a sub-basin or permit basin for the water year evaluation of exceedance of the proportional share UAL. The assigned UAL incorporates all adjustments of the observed load representing the sub-basin or permit basin described in Appendix B3.1 which is incorporated by reference in 40E-63.446(2), F.A.C.

"Target Unit Area Load (target UAL)" in pounds per acre is the C-139 Basin Compliance model phosphorus load estimate (target) calculated in accordance with Appendix B2, which is incorporated by reference in subsection 40E-63.446(1), F.A.C., and divided by the C-139 Basin Acres.

"Limit Unit Area Load (limit UAL)" in pounds per acre is the upper 90% confidence limit of the C-139 Basin Compliance model phosphorus load estimate (also known as the limit) calculated in accordance with Appendix B2, which is incorporated by reference in subsection 40E-63.446(1), F.A.C., and divided by the C-139 Basin acres.

"Proportional Share Unit Area Load (proportional share UAL)" in pounds per acre is the calculated maximum allowable phosphorus load in proportion to land area. The proportional share UAL shall be based on the target UAL if C-139 Basin non-compliance is based on exceedance of the target, and/or on the limit UAL if the C-139 Basin non-compliance is based on exceedance of the limit.

"C-139 Basin Acres" is the total acreage within the C-139 Basin Boundaries described in the Everglades Forever Act, section 373.4592(16), F.S. adjusted for any identified changes to the hydrologic drainage area.

The calculation of the proportional share UAL is provided as follows.

(A) If the C-139 Basin is out-of-compliance as a result of exceeding the target three years in a row (as described in Appendix B2, which is incorporated by reference in subsection 40E-63.446(1), F.A.C., "Evaluation of the C-139 Basin for compliance...", paragraph 3):

1. the proportional share UAL is the arithmetic average of the three target UAL values calculated for the three water years (excluding any suspension due to rainfall), and
 2. a sub-basin or permit basin will be deemed to have not exceeded its proportional share of the loading if the average of the three annual assigned UAL values corresponding to the three water years causing the out of compliance condition is less than or equal to the proportional share UAL.
- (B) If the C-139 Basin is out of compliance as a result of exceeding the limit in a single year (as described in Appendix B2, which is incorporated by reference in subsection 40E-63.446(1), F.A.C, "Evaluation of the C-139 Basin for compliance...", paragraph 4):
1. the proportional share UAL is the same as the limit UAL calculated for that water year, and
 2. a sub-basin or permit basin will be deemed to have not exceeded its proportional share of the loading if the assigned UAL for the water year in question is less than or equal to the proportional share UAL.
- (C) If the C-139 Basin is out-of-compliance exceeding both the target for three years and limit the current year (e.g. target, target, limit):
1. both the current water year limit UAL and the average of the three target UAL values (excluding any suspension due to rainfall) are utilized for assessment of a proportional share UAL, and
 2. a sub-basin or permit basin will be deemed to have not exceeded its proportional share of the loading if both the average of the three annual assigned UAL is less than or equal to the average of the three target UAL values and the current water year assigned UAL is less than or equal to the limit UAL.

Permit basins will be evaluated from the largest to smallest sub-basin that they belong to, and then based on their individually monitored permit basin data, if applicable. If a single sub-basin level to which a permit basin belongs is determined to meet the proportional share UAL, water quality improvement activities will not be required based on subsection 40E-63.446(2), F.A.C., regardless of additional sub-basin level or permit basin monitoring results. Three tiers of sub-basins have been defined for the C-139 Basin as indicated in Table B-3, which relates each initial primary, secondary and tertiary sub-basin to its larger or smaller units.

Table B-3: Primary, Secondary and Tertiary Sub-basin Levels

Primary Sub-basins	Secondary Sub-basins	Tertiary Sub-basins
L1		
L3	L2	L2W
		L2E
		L2S
	DF	DFW
		DFE
	SM	SMW
		SME

Appendix B3.2 “Criteria for Required Phosphorus Reductions” describes the method for determining the percent reduction in total phosphorus required for those permittees whose permit basin(s) is out-of-compliance. The water quality improvement strategy is to require that any additional required improvements to the permittee’s BMP Plan or water quality improvement activities be based on their ability to achieve the percentage total phosphorus reduction levels specified by the District (required total phosphorus reductions). Permittees will propose additional improvements to the BMP Plan and expected reductions. These reductions may be estimated based on the most current applicable technical references or based on a monitoring program that confirms estimated total phosphorus reductions (verification plan).

The method to estimate the percent required total phosphorus reduction level is indicated below:

1. The total phosphorus reduction levels will be based on the limit Unit area load (UAL), the target UAL, the proportional share UAL and the assigned UAL derived for each permit basin pursuant to Appendices B2 and B3.1, which are incorporated by reference in subsection 40E-63.446(1) and (2)(a), F.A.C.
2. If the C-139 Basin is out-of-compliance as a result of exceeding the target three years in a row (as described in Appendix B2, “Annual Performance Determination”, paragraph number 3, incorporated by reference in subsection 40E-63.446(1), F.A.C.), the required total phosphorus reduction for each permit basin will be calculated as the percent difference between the arithmetic average of the assigned UAL values calculated on the year that non-compliance occurs and the two previous years and the

proportional share UAL (excluding any suspension due to rainfall as described in Appendix B2, which is incorporated by reference in subsection 40E-63.446(1), F.A.C.)

Required TP reduction level (%) = 100% x

(Average (Assigned UAL in Years 1, 2, 3) - Proportional Share UAL) / Average of (Assigned UAL in Years 1, 2, 3)

3. If the C-139 Basin is out of compliance as a result of exceeding the limit in the current year (as described in Appendix B2, "Annual Performance Determination", paragraph 4, which is incorporated by reference in subsection 40E-63.446(1), F.A.C.), the required percentage total phosphorus reduction will be calculated for each permit basin as the percent difference between its assigned UAL and its proportional share UAL on the year that non-compliance occurs.

Required TP reduction level (%) =

100% x (Assigned UAL – Proportional Share UAL) / Assigned UAL

4. If the C-139 Basin is out-of-compliance exceeding both the target for three years in a row and the limit the current year (e.g. target, target, limit), the required total phosphorus reduction shall be the greater of those calculated from (2) and (3) above.

The criteria for District approval of BMP Plan improvements or water quality improvement activities is as follows. Under a C-139 Basin wide out of compliance scenario, the level of effort required for improvements to the BMP Plan may vary across permit basins based on the required total phosphorus reduction level for each one. As described in 40E-63.461(2)(b), F.A.C., the total phosphorus removal efficiency of the activities described within the proposal shall aim to meet the required total phosphorus reduction applicable to the permit basin.

An applicant may submit a proposal for voluntary implementation of additional BMPs (Early BMPs), or a voluntary BMP Demonstration Project that includes a BMP performance verification plan, for District review.

1.4 Alternative BMP Demonstration Project

The proposed rule provides the option for voluntary permittee participation in research and demonstration projects which may account for no more than 20 BMP equivalent points as approved by the District. This provision is not included in the current rule. An additional objective of Part IV is added to Section 40E-63.400 "Purpose and Policy" as follows: "(3)(d) to develop and conduct research and demonstration projects to improve

and confirm the effectiveness of BMPs for reducing phosphorus and other constituents that are not being significantly improved by either Stormwater Treatment Areas (STAs) or BMPs”..

A permittee may propose an “Alternative BMP Demonstration Project” using the following criteria. If a demonstration project is proposed to meet the BMP implementation requirements of subsection 40E-63.437 (3), F.A.C., a proposed project scope of work shall be submitted for District review and approval based on the following criteria.

- (a) The scope of eligible projects shall include, at a minimum, the demonstration or research hypothesis, a description of implementation, the technical basis and scientific methods that will be employed, the performance indicators that will be measured such as water quality, water quantity, soil testing, or as applicable, the progress and final reports that will be produced to verify progress and results, and a schedule that details the beginning date, critical milestones and ending date of the project.
- (b) The 35 BMP equivalent point requirement shall be met in the permit basin where the project is proposed. The proposed demonstration shall account for no more than 20 BMP equivalent points as approved by the District. The remaining 15 BMP equivalent points shall include 10 BMP equivalent points in the nutrient control practices category and 5 BMP equivalent points in the water management practices category.
- (c) The proposed BMP equivalent points for the demonstration project will only be considered for the period of project implementation, the permit basin where the project is located, and for the crops or land uses to which the project applies.
- (d) BMP equivalent points shall be initially determined by the District prior to issuance of a permit based on the BMP equivalent points established in Appendix B1 (incorporated by reference in subsection 40E-63.435(1), F.A.C.). Additional BMP equivalent points may be approved by the District if the applicant provides reasonable assurance through plans, test results, water quality data or other information, that the BMP project will demonstrate improvement in phosphorus removal efficiency in comparison to standard BMP implementation methods.
- (e) Once the demonstration project is complete and a final report is submitted in accordance with the approved scope, the permittee shall submit a letter modification application requesting that the approved BMP Plan be modified to incorporate the BMP or water quality improvement activity if the District determines that the BMP was successfully developed under the project. The application shall include the information described under Rules 40E-63.430, 40E-63.435, and 40E-63.437, F.A.C., as applicable, and shall describe how the report recommendations for BMP implementation will apply to the applicable crops or land uses for District review. The District shall re-

view the BMP equivalent points initially assigned and may adjust them based on the reported phosphorus reduction levels and approved methods for implementation of the proposed BMP or water quality improvement activity. If the permittee decides that the BMP resulting from the demonstration project is not to be proposed for continued implementation, the permittee is required to submit a permit modification proposing a BMP Plan, as described in Rules 40E-63.435 or 40E-63.437, F.A.C., as applicable. The application for modification of the approved BMP Plan shall be submitted no later than 30 days after the project completion date pursuant to the District-approved scope.

1.5 Alternative BMP Plans

The proposed rule provides the option for permittees to implement alternative BMP Plans. Applicants may propose to satisfy the water quality requirements of the proposed rule by employing a BMP Plan or water quality improvement activities other than those described in 40E-63.435(1) and (2), F.A.C. The applicant shall provide reasonable assurance, through the information required below and the requirements indicated in 40E-63.435(3), (4), and (5) and (6), F.A.C.⁷, that the alternative contains the equivalent or

⁷ Section 40E-63.435 (3), (4), (5) and (6), F.A.C. state:

“(3) If, at the time a BMP Plan is proposed for approval, the District has previously determined the C-139 Basin to be out-of- compliance, and the permit basin has an approved BMP Plan including water quality improvement activities, the proposed BMP Plan shall include continuation of the approved BMP Plan and water quality improvement activities; or propose an equivalent alternative for District consideration. The applicant shall provide reasonable assurance that the alternative contains the equivalent or greater phosphorus reduction effectiveness of the approved BMP Plan and water quality improvement activities. The proposal must provide the basis that the BMP Plan and water quality improvement activities would have met the criteria indicated in subsection 40E-63.461(3), and (4), F.A.C., as applicable, for the years when the C-139 Basin was determined by the District to be out-of-compliance and water quality improvement activities were required.

(4) An education and training program for the management and operation staff responsible for implementing and monitoring the approved BMP Plan. The training may be provided in-house or arranged by the permittee or other educational resources.

(5) A description of records and documentation to be maintained on-site or at a suitable location that is readily available for District review. The records and documentation shall be sufficient to verify BMP implementation, maintenance, and training, as described in the post-permit compliance section, Appendix C of the Guidebook (incorporated by reference in subsection 40E-63.430(2), F.A.C.) on the form entitled “C-139 Basin Annual Report – Certification of BMP Implementation”.

(6) A proposed implementation schedule. Except for BMP Plans required immediately upon amendment of this part of Chapter 40E-63, F.A.C., as described in Rule 40E-63.420, F.A.C., implementation of new BMPs shall be completed within 90 days after the date of District approval. Alternate implementation schedules may be

greater phosphorus reduction effectiveness of a 35-point BMP plan. A BMP Plan shall take into account site-specific conditions, potential phosphorus sources, primary phosphorus species, and transport mechanisms; and ensure that a thorough approach to implementation and maintenance will be implemented. In order to seek approval of an alternative BMP Plan, applicants must submit the information specified for the applicable alternative as part of the permit application process.

(1) Alternative Type BMP. If an application proposes BMPs not listed in Appendix B1 (incorporated by reference in subsection 40E-63.435(1), F.A.C.), , the application shall also include the following information for District approval:

- (a) A description of the Best Management Practice rationale for the BMP selected;
- (b) a detailed explanation of the proposed BMP;
- (c) a schedule for implementation of the BMP;
- (d) sample documentation of the BMP implementation, how the BMP will be verified;
- (e) technical basis for the reduction effectiveness of the proposed BMP. The applicant shall be required to demonstrate effectiveness through a proposed monitoring program or through representative technical references including modeling results approved by the District. If approved, the District will determine the appropriate BMP equivalent point credit consistent with Appendix B1 (incorporated by reference in subsection 40E-63.435(1), F.A.C.)

(2) Alternative BMP Points per Category. If the BMP Plan does not meet the minimum number of equivalent points per BMP category as required in subsection 40E63.435(2), F.A.C., the application shall include a site assessment demonstrating that an alternative BMP Plan will provide an equivalent or greater reduction effectiveness than using the standard approach.

The site assessment shall evaluate phosphorus imports and transport in discharges; current BMPs and implementation methods; other practices not covered under BMPs (e.g., grazing, irrigation, nutrient and water management); and representative water quality and soil data. Water quality data that can be used for the assessment include

considered by the District if the applicant demonstrates through reasonable assurance that an equivalent level of phosphorus source control is provided.”

those available from the District sub-basin or synoptic (grab) monitoring programs, or properly collected grab samples or using field kits of adequate precision by the applicant.

- (3) Alternative BMP Demonstration Project. This option was described in Section 4.0 above.

1.6 Changes in Permit Types and Application Requirements

This section describes the proposed changes to Permit Types and the proposed changes to application requirements.

Individual Permit Repealed

Under current rule, there are three permit types: No Notice General, General, and Individual. Under the proposed rule, there are two permit types: No Notice General and General. The Individual permit type would be repealed. According to the District, there are no Individual Permits in the C-139 Basin.

Under current rule, an applicant shall apply for an Individual Permit if the applicant is proposing:

- (a) A discharge monitoring program, pursuant to Rule 40E-63.462, F.A.C.;
- (b) A BMP not described in Appendix B1 of Chapter 40E-63, F.A.C.; or
- (c) A BMP implementation schedule that exceeds 90 days, unless the situation qualifies for an exception as described in Rule 40E-63.420(2), F.A.C.

An Individual Permit may be issued to any operating entity or entities, owners, or lessees of all parcels identified in the permit that are individually or collectively responsible for implementing the BMP Plan for all lands specified within the permit, as applicable.

Changes to No Notice General Permit Eligibility

Under current rule, No Notice General Permits for Use of Works of the District within the C-139 Basin are granted to permittees for the surface water system operating permit for parcels of land that connect to or make use of the Works of the District within the C-139 Basin, subject to the requirements of Part IV, including Rule 40E-63.444(1)(e), (f), (g), and (i), F.A.C., and the conditions specified below:

- (a) The land is not subject to the agricultural privilege tax, pursuant to the EFA, Section 373.4592(7)(a), F.S.; and

- (b) The land is served by a properly permitted and operated surface water management system (Environmental Resource Program, ERP, or Surface Water Management Permit, SWM).

Under the proposed rule, No Notice General Permits within the C-139 Basin are hereby granted to the landowners of parcels of land that connect to or make use of the Works of the District within the C-139 Basin, subject to the requirements of this part of Chapter 40E-63, F.A.C., including paragraphs 40E-63.444(1)(d), (g),(h), (i), (j), (l), (m), (r), (s), (t) and (u), F.A.C., and the conditions specified below.

- (a) The parcel is not part of the common facilities of a water management system as defined in 40E-63.402(15), F.A.C., of water control districts or drainage districts pursuant to Chapter 298, F.S., or any other entity operating a central drainage system already permitted under Chapter 737, F.S.; and,
- (b) The parcels are inactive, or add up to less than 40 acres in size under the same ownership. "Inactive" means land parcels that are not used for agriculture, urban, commercial, industrial or other development, as determined by the District. It also includes lands in their undeveloped native state (unless used as pastures). Lands may be determined by the District as temporarily inactive if they are not operated or are vacant due to changes in ownership or land use. The District's determination applies only to the requirements of this part of Chapter 40E-63, F.A.C., and,
- (c) The following BMPs are implemented by the landowner, lessees and operators, if applicable, and the property must be made available for inspection by District staff or other delegated agents within 14 days after written notice.
 1. Phosphorus is only applied to correct phosphorus deficiencies based on soil testing or tissue testing, or for turf and landscape areas, phosphorus is only applied to meet initial establishment and growth needs (fertilizer composition less than 2% for an application rate not to exceed 0.25 lbs P_2O_5 /1000 ft² per application, nor exceed 0.50 lbs P_2O_5 /1000 ft² per year).
 2. Fertilizer or other soil amendments containing phosphorus are not applied within 10 feet of any pond, stream, lake, water course, or any designated wetland.
 3. Spill prevention practices for nutrients are implemented: and
 4. Runoff is managed in accordance with surface water or environmental resource permits, if applicable.

These conditions are new relative to the current rule.

District Notice to Require General Permit Instead of No Notice General Permit

Also new under the proposed rule is that “the District shall require the submission of applications for General Permits from No Notice General Permit holders if the District determines that the property exceeds its proportional share of phosphorus loading based on representative water quality data for the property, as determined in Appendix B3.1 (incorporated by reference in subsection 40E-63.446(2)(a), F.A.C.) Notice of the requirement shall be provided to parcel owners in writing. Applications for new General Permits shall be submitted to the District within 45 days from the date of the notice.

Changes in Application Requirements of General Permits

The following changes to General Permit application requirements are proposed.

1. Applications for General Permits would require that the applicant include a delineation of “drainage features depicting the permit basin, general direction of flow, inflow points, and discharge points off-site for delineation of permit basins, as defined in subsection 40E-63.402(10), F.A.C.”
2. Any changes in drainage or operations not identified previously that could affect the surface water management system, must be reported in writing in advance to the District to determine if an Environmental Resource/Surface Water Management Permit is required.
3. If not previously authorized by a District permit under this part of Chapter 40E-63, F.A.C., the permittee shall submit a permit modification application 30 days in advance of conducting any:
 - 3.1 Changes in BMPs; or
 - 3.2 Change in land practice affecting the approved BMP Plan; or
 - 3.3 Changes in water management that may affect the Sub-basin Monitoring Program (e.g., resulting from completing Environmental Resource/Surface Water Management Permit-authorized water management system changes.)
4. Within 30 days of issuance of the permit, as of the effective date of the amendments to this part of Chapter 40E-63, F.A.C., for lessees that are not co-

applicants, the permittee shall provide written certification that the lessees have received a copy of the permit and agree to implement the BMP Plan and be bound by the terms and conditions of the permit, including any amendments thereto.

5. For leases executed after the effective date of the amendments to this part of Chapter 40E-63, F.A.C. (in which the lessee is not a co-applicant), within 30 days of its date of execution, the permittee shall provide written certification by the lessee or a copy of the lease indicating the lessee's agreement to implement the BMP Plan and be bound by the terms and conditions of the permit, including any amendments thereto.
6. Authorizations from other agencies for disposal or application of wastewater residuals (biosolids), animal manure, solid waste, fill material, or other materials containing phosphorus within the C-139 Basin, shall not relieve permittees from complying with the provisions of this Rule. Water quality monitoring data will be required by the District to demonstrate no potential impacts on phosphorus loading.

Changes in Permit Applications Fees

Permit application fees are unchanged from current rule. Because the Individual Permit has been repealed, applicants that would have needed to pay the higher fees associated with this permit type will see a cost reduction.

An additional permit modification called a "Letter Modification" was added to the proposed rule with a fee of \$0, or no charge. The need for letter modifications was added to certain permit actions under the proposed rule.

1.7 Impracticability

Under the proposed rule, permittees may elect to demonstrate that water quality improvement activities are impracticable. This option is not provided under current rule. Any such request for determination of impracticability must be submitted to the District under a permit modification application. For the District to consider the application for approval, the submittal shall:

- (a) Specify all of the BMPs and activities that were implemented previously and provide evidence to show that no additional BMPs and activities or refinements for the reduction of phosphorus can be reasonably accomplished at the site or sites of operation.

- (b) Propose the expected amount of phosphorus discharge in comparison to the C-139 Basin's phosphorus load targets and limits, calculated in accordance with Appendices B3.1 and B3.2 (incorporated by reference in subsection 40E-63.446(2)(a), F.A.C.), for the range of historic rainfall conditions in accordance with Appendix B2 (incorporated by reference in subsection 40E-63.446(1), F.A.C.) No increasing trend in phosphorus from the property, as determined by the District, will be allowed under any scenario. The District will review the proposed performance level in reference to available representative historic data.
- (c) Propose a discharge monitoring plan in accordance with Rule 40E-63.462, F.A.C., to verify that the proposed performance level is met. In the event that the farm configuration is not conducive to a discharge monitoring program, the District may consider requests for the use of alternate representative locations or monitoring for concentration only. Upon District approval of the monitoring plan, special limiting conditions (such as applicable conditions from Rule 40E-63.464, F.A.C.) will be incorporated to the permit.
- (d) Such requests shall apply only to the permit basin or portion thereof (e.g., land use, crop or acreage) which demonstrated further activities are impracticable.
- (e) The District shall send a copy of each such request to the Department of Environmental Protection.
- (f) Determinations of impracticability will be valid until the next permit renewal cycle.

1.8 Verification Plan

Current and proposed rule establishes a BMP compliance verification and enforcement program to ensure that phosphorus discharges from the Basin do not exceed historic levels, based upon water quality monitoring data from the period October 1, 1978 to September 30, 1988.

Under current rule, the permittee may verify the effectiveness of proposed BMPs not listed in Appendix B1 of Chapter 40E-63, F.A.C. through a proposed monitoring program or by reference to applicable research data. No other verification requirements associated with BMP effectiveness are provided in current rule other than the Permit Basin Discharge Monitoring Program which is described later in this Section.

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The proposed rule defines “Verification Plan” as “a water quality monitoring program to verify the expected effectiveness of a BMP Plan or proposed water quality improvement activities in accordance with Rule 40E-63.461(4), F.A.C.”

Under the proposed rule, if the C-139 Basin is determined to be out-of-compliance with the water quality requirements of Part IV pursuant to section 40E-63.446, F.A.C., the permittee shall propose water quality improvement activities. The submittal shall include a proposal for water quality improvement activities along with the estimated phosphorus reductions to be achieved in accordance with 40E-63.461(3), F.A.C., or a verification plan in accordance with 40E-63.461(4), F.A.C.

The permittee may provide evidence of the percent total phosphorus removal efficiency using the available data as described in the proposed rule or submit and implement a verification plan described as follows.

All water quality improvement activities proposals shall indicate the expected range of percent total phosphorus removal efficiency resulting from the proposal as follows.

- (a) The expected or assumed range of percent total phosphorus removal efficiency shall equal or exceed the percent required total phosphorus reduction applicable to the permit basin.
- (b) The expected or assumed total phosphorus removal efficiency shall be based on data from the most current representative technical references including peer reviewed or published BMP research and demonstration projects, with consideration of permit basin specific conditions such as identified when a site-assessment is completed pursuant to 40E-63.437(2), F.A.C.
- (c) Each proposal shall include a detailed description of the technical basis and copies of documents as applicable. All proposed total phosphorus reductions shall be based on scientific studies, calibrated models, or data collection representative of the C-139 Basin for District approval.

If the permittee is unable to demonstrate that the required total phosphorus reductions can be achieved in accordance with (b) above, a verification plan shall be required.

If a permittee opts to or is required to conduct a monitoring program to confirm that required total phosphorus reductions will be achieved, a permittee shall propose a verification plan in addition to the proposal for improvements to an approved BMP Plan or water quality improvement activities. All verification plan proposals shall include the following information for District review and approval.

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- (a) The description of who will be responsible for project implementation.
- (b) The proposed reporting procedures during and at completion of the project.
- (c) A Final report at completion that describes how the recommendations for BMP implementation will be applicable to the crops or land uses to meet the required total phosphorus reduction, or
- (d) The tools that will be used to verify total phosphorus reduction levels such as water quality and quantity monitoring to determine total phosphorus loading pre- and post-BMP improvement and to estimate total phosphorus reduction efficiency. Total phosphorus and phosphorus speciation data collected at the District sub-basin monitoring locations may serve as representative monitoring.
- (e) The parameters under which total phosphorus reduction levels will be measured and verified so that findings are repeatable and applicable within the C-139 Basin conditions (climatic conditions, soils, geology, etc.)
- (f) A schedule not to exceed three calendar years from the date of District approval of the proposal. Once the confirmatory verification is completed and a final report is submitted in accordance with the approved scope, the permittee shall submit a letter modification application in accordance with Rule 40E-63.439, F.A.C., and subsections 40E-63.461(2) and (3), F.A.C, to either:
 - a. modify the approved BMP Plan to incorporate changes based on the final report recommendations for the District's consideration, or
 - b. propose other water quality improvement activities consistent with the requirements of this rule.

1.9 Permit Basin Discharge Monitoring Program

The proposed rule regarding the Permit Basin Discharge Monitoring Program is very similar to current rule except for the following.

- It has been edited to be consistent with the other provisions of the proposed rule.
- It provides clarification regarding the requirements of this Program.

- It incorporates by reference the “Flow Calibration Guidelines Developed in Support of Chapter 40E-63, F.A.C., Everglades BMP Permit Program”. This document is unchanged from its current version.
- It adds a requirement that: “During periods of off-site discharge, water quality composite samples shall be collected by automatic sampler, preserved, and the composite sample shall be: a) removed from the sample collection site and delivered to the laboratory no later than 21 days from the time the first individual sample was taken and, b) analyzed for total phosphorus no later than 28 days from the time the first individual sample was taken”.
- It adds the option that permittees may be required to implement a Permit Discharge Monitoring Program.

This Section describes the Permit Basin Discharge Monitoring Program as provided in the proposed rule.

- (1) In addition to implementing an approved BMP Plan, permittees may elect or be required to participate in a discharge monitoring program pursuant to Rules 40E-63.437, 40E-63.438, paragraph 40E-63.444(1)(r), subsection 40E-63.461(4) or 40E-63.461(6), F.A.C., and be subject to:
 - (a) For permittees electing a discharge monitoring program or permittees required to implement a monitoring program pursuant to subsection 40E-63.461(6), F.A.C.: alternative, site-specific evaluations of compliance with phosphorus load targets and limits for the areas represented by the monitoring plan when the C-139 Basin is collectively determined to be out-of-compliance in accordance with Chapter 40E-63, F.A.C., Appendix B2 (incorporated by reference in subsection 40E-63.446(1), F.A.C.); and
 - (b) Compliance with permit conditions in accordance with Rule 40E-63.444, F.A.C
- (2) To implement a discharge monitoring program, permittees must provide a permit application with the following information.
 - (a) An acceptable discharge (quantity and quality) monitoring plan that provides reasonable assurance that annual water discharge and total phosphorus load are accurately documented.
 - (b) All flow quantity discharge from the property shall be calculated using a proposed method by a Florida-registered Professional Engineer in a flow calibration report

approved by the District. A calibration report shall be required for each pump, culvert or other discharge structure. Uncontrolled off-site discharges, such as overland sheet flow, shall also be quantified in the report. Each calibration report shall contain, at a minimum: data collection methodology, instrumentation and procedures; the actual field data collected; the basis for the full operating range represented by the data; the methodology for development of the calibration equation; operational information needed to calculate flow with a temporary backup methodology to be used if the primary equipment becomes inoperable; and the final calibration equation and primary method for calculating the flow.

This portion is new under the proposed rule: “A plan that includes the items specified in the “Flow Calibration Guidelines Developed in Support of Chapter 40E-63, F.A.C. Everglades BMP Permit Program” (incorporated by reference in subsection 40E-63.462(2)(d), F.A.C.), generally provides reasonable assurance that methods to measure water quantity will be reasonably accurate, however, other alternatives may be proposed by the applicant and authorized by the District”.

- (c) A schedule to install equipment and implement the monitoring plan no later than 30 days after issuance of the permit; and
- (d) Other site specific information required by Appendix B3.1 (incorporated by reference in subsection 40E-63.446(2), F.A.C.)

For those applicants proposing to implement the permit basin discharge monitoring program, the District-approved monitoring plan will be incorporated into an amended General Permit and the following limiting conditions shall be met. These limiting conditions will be attached to the General Permit.

- (1) The discharge (quantity and quality) monitoring plan shall provide reasonable assurance that the annual water discharge and total phosphorus load are accurately documented.
- (2) The approved discharge monitoring plan shall be incorporated by reference and made part of this permit.
- (3) The equipment shall be installed and the monitoring shall start no later than 30 days after the permit issuance date. Within 60 days after the permit issuance date, the permittee shall contact the District to verify that installation of the monitoring equipment is complete and to schedule an inspection;
- (4) The permittee shall implement the discharge monitoring plan in accordance with the permit and shall submit to the District any proposed modification of the plan by

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submitting an application to modify the permit for review and approval prior to implementation.

- (5) The location of sample collection shall be such that water sampled is representative of all water from the monitored area that discharges off-site.
- (6) All water quality sample collection, preservation, handling, transport, and chain-of-custody documentation shall be conducted in accordance with an approved Comprehensive Quality Assurance Plan as specified in the approved discharge monitoring plan. All laboratory analyses shall be conducted by a laboratory with proper certification for the specified parameter (e.g. phosphorus);
- (7) In the event that water quality automatic sampling equipment becomes inoperable for any reason, grab samples shall be temporarily taken on a daily basis during flow events and composited for a maximum of 14 days for total phosphorus analysis. Reasonable effort must be made to render the automatic sampling equipment operable within 14 days;
- (8) Monitoring conditions may be reduced or adjusted upon submission of data and/or studies that provide the basis for such, reasonably demonstrating that equivalent data will be obtained with the reduction or adjustment in monitoring;
- (9) The District will provide at least one week notice to the permittee of the intent to conduct a quality assurance field audit of the sampling collection procedures;
- (10) The water quantity and quality data shall be submitted to the District no later than 60 days from the last day of the sampling period being reported. Water quantity and quality data shall be submitted to the District in an approved electronic format on a monthly basis.
- (11) All flow quantity discharged from the property shall be calculated using a method proposed by a Florida-registered Professional Engineer in a Calibration Report approved by the District. A Calibration Report shall be required for each pump, culvert or other discharge structure. The report shall also quantify uncontrolled off-site discharges, such as overland sheet flow. Each Calibration Report shall contain, at a minimum: data collection methodology, instrumentation and procedures; the actual field data collected; the basis for the full operating range represented by the data; the methodology for development of the calibration equation; operational information needed to calculate flow with a temporary backup methodology to be used if the primary equipment becomes inoperable; and the final calibration equation and primary method for calculating the flow. Any modification

to the approved calibration shall require an application to modify the existing permit.

- (12) During periods of off-site discharge, water quality composite samples shall be collected by automatic sampler, preserved, and the composite sample shall be: a) removed from the sample collection site and delivered to the laboratory no later than 21 days from the time the first individual sample was taken and, b) analyzed for total phosphorus no later than 28 days from the time the first individual sample was taken.

1.10 Early Implementation of Water Quality Improvement Activities

An applicant may request approval for early implementation by opting to submit a proposal for voluntary implementation of additional BMPs (early BMPs), or a voluntary demonstration project that includes a BMP performance verification plan, for District review as follows.

- (1) Either proposal shall be submitted together with an application for a new permit, permit renewal, or as a letter modification.
 - (a) For optional early BMPs the application shall provide information for meeting the criteria below.
 1. A description of the BMP or group of BMPs (early BMPs) that are proposed in addition to those required by rule at the time of application (Rule 40E-63.435 or subsection 40-63E.461(3), F.A.C., as applicable.) The proposal shall include the specific methods for implementation and maintenance of the early BMPs.
 2. The proposal shall provide reasonable assurance through technical documentation, and the requirements indicated in sections 40E-63.435(4) and (5), F.A.C., that the combined effect of the optional early BMPs and rule-required BMPs will ensure a phosphorus loading reduction for the identified permit basin or parcels sufficient for the C-139 Basin to consistently achieve compliance with the Target, as described in Appendix B2 (incorporated by reference in subsection 40E-63.446(1), F.A.C.) The District will review whether the proposed loading reduction levels would be conducive to meeting the Target Unit Area Load (UAL) based on the most recent five years of water quality data.
 3. The proposal shall include an implementation schedule.

- (b) For voluntary demonstration projects, the application shall propose a BMP or water quality improvement measure demonstration project that meets the following conditions.
 - 1. Complies with the criteria described under section 40E-63.437(3)(a), F.A.C.
 - 2. Projects estimated phosphorus reductions based on available technical references, and
 - 3. Proposes a verification plan through a Discharge Monitoring Program to confirm and quantify the estimated phosphorus reductions. The verification plan shall meet the criteria described in subsection 40E-63.461(4), F.A.C.
- (2) Upon District approval of the voluntary early BMP implementation project or demonstration project with a verification plan, the permittee will be subject to the BMP reporting and verification requirements of this Chapter for those voluntary initiatives, as described in permit conditions. Permittees cannot be deemed out of compliance solely for failure to implement the early initiatives, however, the permittee cannot qualify with the conditions of 40E-63.446(2)(b) and 40E-63.446(2)(c), F.A.C., unless:
 - (a) The early BMPs are implemented.
 - (b) Reporting and verification requirements for the voluntary early implementation projects are met, as determined by the District, and
 - (c) The permittee is in compliance with the BMP Plan required by the permit.

Section 2.0

Number of Individuals and Entities Likely Required to Comply

2.1 General

Under current rule, owners of land whose water management systems connect with and make use of the canals, structures and other Works of the District within the C-139 Basin are required to comply with Chapter 40E-63, Part IV, “Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin” per Rule 40E-63.400(1), F.A.C. Permits granted by the District under this rule are called “C-139 Basin Pollutant Source Control Permits”.

Under the proposed rule, the individuals and entities required to comply with Rule 40E-63.400(1), F.A.C. as summarized above, are the same. However, the definition of the C-139 Basin was clarified to account for any new surface inflow in accordance with the Everglades Forever Act (statutory) definition of the C-139 Basin by adding the statement: “or lands outside those boundaries which discharge to the C-139 Basin or to the canals or structures described in Rule 40E-63.401(1)”. This revision does not change the current number of persons and entities required to comply with the proposed rule. However, there is the potential that future changes in land uses surrounding the C-139 Basin may require additional persons and entities outside of the C-139 Basin to comply with the proposed rule. The number of these future persons and entities is not known.

2.2 No Notice General Permits and General Permits

The current rule allows for No Notice General Permits for owners of parcels of land that connect to or make use of the Works of the District within the C-139 Basin that are not subject to the Agricultural Privilege Tax pursuant to the Everglades Forever Act, Section 373.4592(7)(a), F.S., and that the land is served by a properly permitted and operated surface water management system (Environmental Resource Program, ERP, or Surface Water Management Permit, SWM). Owners of all other land parcels within the C-139 Basin are required to apply for either an Individual permit or a General permit.

Under the proposed rule, No Notice General Permits are provided to owners of land parcels meeting the conditions listed below:

- (1) The parcel is not part of the common facilities of a water management system as defined in subsection 40E-63.402(15), F.A.C., of water control districts or drain-

nage districts pursuant to Chapter 298, F.S., or any other entity operating a central drainage system already permitted under Chapter 373, F.S.; and

- (2) The parcels are “Inactive”¹ or add up to less than 40 acres under the same ownership; and
- (3) Basic BMPs are implemented.

All other land parcels would be required to apply for and maintain a General Permit.

2.3 Individual Permits

Under the proposed rule, the Individual permit type would be repealed. Activities previously permitted under an Individual permit could be implemented under a General Permit in the proposed rule. There are no Individual Permits in the C-139 Basin.

2.4 Methodology

C-139 Basin Works of the District permit data from the South Florida Water Management District and the property database maintained by the Hendry County Property Appraiser’s office were used to identify the sizes and uses of parcels located in the C-139 Basin and those parcels whose owners pay the Agricultural Privilege Tax.²

Some of the properties in the C-139 Basin are owned by the same person, persons or entities. For the purposes of this SERC, all properties under common ownership or served by the common facilities of a surface water management system are counted as one permit. Also, there may be more than one person listed as the owner of a property, so the number of individuals and entities affected by the proposed rule is larger than the number of permits.

For discussion purposes, the C-139 Basin is segregated into the larger agricultural and conservation area comprising about 158,811 acres and the smaller generally non-agricultural area comprised of Montura Ranches Estates, Flaghole Estates and Eckerd Family Youth Alternatives which totals about 9,569 acres. The total land area in the C-

¹ Inactive means land parcels that are not used for agriculture, urban, commercial, industrial or other development, as determined by the District. It also includes lands in their undeveloped native states (unless used as pastures). Lands may be determined by the District as temporarily inactive if they are not operated or are vacant due to changes in ownership or land use. The District’s determination applies to the requirements of this part of Chapter 40E-63, F.A.C.

² The Hendry County Property Appraiser’s property database was found at www.hendryprop.com.

139 Basin is the sum of these two land areas, or 168,450 acres. Each of these two areas is described below.

2.5 Agricultural Land Uses and Conservation Areas

The numbers of required General Permits that are in agricultural land uses or that are conservation areas under the current rule and the proposed rule were evaluated. Under the current rule, there are 27 C-139 Basin Pollutant Source Control General Permits³ in agricultural land uses and four General Permits covering lands that were converted from agriculture to conservation. The land areas associated with these permits range from 121 acres to 53,000 acres. These 31 General Permits represent about 60 landowners and operators.

Under the current and proposed rules, the 27 General Permits issued to the agricultural operations would need to be renewed. Under the current rule, the five owners of the four conservation areas with General Permits would need to renew their General Permits because these properties do not have a properly permitted and operated surface water management system. Under the proposed rule the owners of these four conservation areas would qualify for a No Notice General Permit rather than a General Permit. These lands would likely meet the conditions of No Notice General Permits under 40E-63.415: they are not part of the common facilities of a water management system, they meet the definition of Inactive land use, and they would implement the basic BMPs.

2.6 Non-Agricultural Area

Eckerd Family Youth Alternatives, Inc., Central County Water Control District, Montura Ranches Estates, and Flaghole Estates⁴ are the main non-agricultural areas in the C-139 Basin. A description of permitting requirements for the property owners in these areas under the current and proposed rules is as follows.

1. Eckerd Family Youth Alternatives, Inc. is classified as a Non-Profit entity that owns 269 acres of non-agricultural land (a youth camping ground) in the C-139 Basin. The land is served by a properly permitted and operated surface water management system. Under the current rule this land qualifies for a No Notice General Permit. Under the proposed rule, the property would require a General Permit because it is greater than 40 acres.
2. The Central County Water Control District is classified by the property appraiser's office as a Water Management District. Central County's purposes are to reclaim,

³ Herein referred to as General Permits.

⁴ This is the portion of Flaghole that is located within the C-139 Basin.

drain, and irrigate the land within its boundaries and to construct, acquire by donation, or purchase recreational facilities and areas for the benefit of its residents.⁵ The Central County Water Control District operates a surface water management system permitted by the South Florida Water Management District. The Central County Water Control District's service area is the Montura Ranches Estates, which is located in the northern C-139 Basin.⁶ The Central County Water Control District has many land parcels located inside and outside the Montura Ranches Estates. This District was created in 1970 under Chapter 70-702 by a special Act of the Florida Legislature. Under current rule, this entity has a No Notice General Permit because it has a properly permitted and operating surface water management system. Under the proposed rule, this entity would be required to have a General Permit because it is part of the common facilities of a water management system operated by a water control district, drainage district, or central drainage system.

3. Montura Ranches Estates is primarily a residential area located in the northwest portion of the C-139 Basin. It represents about 8,660 acres or about 5 percent of the C-139 Basin acreage. Under the current rule, the properties in Montura Ranches Estates are granted No Notice General Permits because none of the properties is assessed an Agricultural Privilege Tax and because these lands are served by the Central County Water Control District. Review of the Hendry County Property Appraisers Office records indicates that 21 properties in Montura Ranches are in agricultural use. However, none of the landowners of these properties pays the Agricultural Privilege Tax. For purposes of this SERC it is considered that under the current rule properties paying the Agricultural Privilege Tax would be required to obtain a General Permit, or become co-applicants of a General Permit if served by common surface water management systems (e.g., agricultural properties in Montura Ranches Estates.)

Under the proposed rule, properties in Montura Ranches Estates would be granted No Notice General Permits if the land area under single ownership is Inactive or is less than 40 acres. Data review indicates that, except for property owned by Weekly Brothers Leasing, LTD., all other parcels would qualify for No Notice General Permits. The numbers of properties in Montura Ranches Estates associated with each land use classification are provided in Table 2.1.

⁵ Central County Water Control District, Hendry County, Florida, "Financial Report for the Fiscal Year Ended September 30, 2008 obtained from www.myflorida.com, page 12.

⁶ From map of Districts in Collier, Glades and Hendry counties obtained from: http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/collier_glades_hendry_09.pdf

4. Weekly Brothers Leasing, LTD owns about 300 acres of native pastureland that drain into the Central County Water Control District within Montura Ranches Estates. An Agricultural Privilege Tax is not paid on this property. Therefore, this landowner is exempt from current rule. Under the proposed rule, this landowner would be required to be a co-permittee with the Central County Water Control District.
5. A portion of Flaghole Estates (640 acres) is located within the C-139 Basin. This area consists of land parcels from one to 30 acres. The smaller parcels have single-family or mobile homes. The larger parcels are pastureland. Review of the Hendry County Property Appraisers Office records indicates that 18 properties are in agricultural use and that eight owners of 12 of these properties pay the Agricultural Privilege Tax. For purposes of this SERC, the criteria to determine which properties would require a General Permit under current rule is the same as for Montura Ranches Estates. The numbers of properties in Flaghole Estates associated with each land use classification are provided in Table 2.1. There are 12 properties paying the Agricultural Privilege Tax that account for 8 permits and 10 landowners and operators who are required to have a General Permit under the current rule. Under the proposed rule, these properties would be granted No Notice General Permits because they are smaller than 40 acres under common ownership.
6. Counting commonly owned properties as one No Notice General Permit, there are 4,807 No Notice General Permits under the current rule associated with 6,474 individual persons and entities in Montura Ranches Estates and Flaghole Estates. These permits include the agricultural properties that do not pay the Agricultural Privilege Tax and the non-agricultural properties presented in Table 2.1. The combined acreage of properties with the same owner for all but seven of these owners is less than 40 acres. These seven owners have more than 40 acres but the land use of the properties is Vacant Residential according to the property database. It is assumed that these properties would fall under the "Inactive" definition in the proposed rule.

Table 2.1
Number of Properties in Montura Ranches Estates and Flaghole Estates
From the Hendry County Property Appraiser's Office (a)

Land Use	Flaghole Estates (b)	Montura Ranches Estates	Total
NON-AGRICULTURAL			
Vacant Residential	15	5,022	5,037
Mobile Home	25	978	1,003
Single Family Home	14	210	224
Vacant Commercial	0	5	5
Government	2	2	4
Commercial	0	9	9
Total	56	6,226	6,282
AGRICULTURAL THAT DOES NOT PAY AGRICULTURAL PRIVILEGE TAX			
Pasture	1	9	10
Semi-Improved Pasture	3	2	5
Native Pasture	2	2	4
Poultry/Bees/Fish	0	5	5
Ornamentals/ Misc Agriculture	0	3	3
Total	6	21	27
AGRICULTURAL THAT PAYS AGRICULTURAL PRIVILEGE TAX			
Pasture	7	0	7
Semi-Improved Pasture	4	0	4
Native Pasture	1	0	1
Total	12	0	12

(a) Some of the properties counted in this table are under the same ownership. The number of properties where properties owned by the same persons or entities is counted only once is less than the number of properties presented in this table. Also, a property can have more than one owner. For example, combining properties with common owners of the 12 agricultural properties in Flaghole Estates that pay the Agricultural Privilege Tax results in 8 permits associated with 10 individual persons and entities.

(b) The portion of Flaghole within the C-139 Basin.

Source: Hendry County Property Appraiser's Office Property Database, www.hendryprop.com.

2.7 Summary of Results

A summary of the estimated number of individuals and entities required to comply with the current rule and the proposed rule are provided in Table 2.2.

Table 2.2
Estimated Number of Persons and Entities Required to Comply
With the Current and Proposed C-139 Basin Works of the District Rule (a)

Property / Owner Description	Current Rule		Proposed Rule	
	Number of Permits	Number of Landowners and Operators	Number of Permits	Number of Landowners and Operators
A. General Permits Required				
In Agricultural or Conservation Area -				
Landowner Pays Agricultural Privilege Tax (b)	27	55	27	55
Land in Conservation, Owner does not have permitted & operating Surface Water Management System	4	5	0	0
Landowner Pays Ag Privilege Tax in Flaghole (c)	8	10	0	0
Government (Central County Water Control District) (d)	0	0	1	2
Commercial (Eckerd Family Youth Alternatives, Inc.)	0	0	1	1
Land in SE Corner of C-139 Basin that was in Aquaculture and now is Inactive	1	1	0	0
Total General Permits Required	40	71	29	58
B. No Notice General Permits				
Properties Located in Montura Ranches and Flaghole (e)	4,807	6,474	4,815	6,484
Land in Conservation, Owner does not have permitted & operating Surface Water Management System	0	0	4	5
Government (Central County Water Control District)	1	2	0	0
Commercial (Eckerd Family Youth Alternatives, Inc.)	1	1	0	0
Land in SE Corner of C-139 Basin that was in Aquaculture and now is Inactive	0	0	1	1
Total No Notice General Permits	4,809	6,477	4,820	6,490
Total General and No Notice General	4,849	6,548	4,849	6,548

(a) Given the currently known land uses, parcel sizes and Agricultural Privilege Tax payments as of March 2010. This table excludes an inactive land parcel owned by the District on the SE Corner of the C-139 Basin. The numbers in Table 2.2 cannot be compared to the numbers in Table 2.1 because the data used to create Table 2.1 must first be evaluated to combine the properties that have the same owner in order to create Table 2.2.

(b) Land uses include pasture, vegetables, citrus groves and sugarcane. Based on General Permit data provided by the South Florida Water Management District in April 2010 and includes information to determine number of permits, number of landowners and number of operators.

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(c) *Number of permits and number of landowners based on individual property tax records of the agricultural properties in Montura Ranches and Flaghole Estates and on a list of properties whose owners pay the Agricultural Privilege Tax. This list was obtained from the Hendry County Property Appraiser's Office property database. The number of permits assumes that all parcels under the same ownership are included in one permit. Does not include operators because such data were not readily available from public information sources.*

(d) *Number of Landowners and Operators under Proposed Rule includes the Central County Water Control District and Weekly Brothers Leasing LTD.*

(e) *Based on property data from the Hendry County Property Appraiser's Office property database. To estimate the numbers of permits and persons and entities who would qualify as a No Notice General Permittee under the proposed rule, the number of General Permittees who pay the Agricultural Privilege Tax and who are less than 40 acres is added to the number of permits and landowners under current rule ($4,815 = 4,807 + 8$ and $6,484 = 6,474 + 10$).*

General Permits. Under current rule, about 71 landowners and operators associated with 40 permits are required to apply for and maintain General Permits in compliance with Chapter 40E-63, Part IV, "Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin". Under the proposed rule, about 58 landowners and operators associated with 29 permits would be required to apply for and maintain General Permits.

No Notice General Permits. Under current rule, about 6,477 landowners and operators associated with 4,809 permits are currently No Notice General Permits in compliance with Chapter 40E-63, Part IV, "Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin". Under the proposed rule, about 6,490 landowners and operators associated with 4,820 permits would be granted No Notice General Permits.

Section 3.0

Cost to the District and Any Other State and Local Government Entity

3.1 Cost to the District to Implement and Enforce the Proposed Rules

The cost to the District includes any additional staff hours to implement and enforce the proposed rule relative to the current rule. The activities that would need to be conducted by the District under the current rule and the proposed rule and the frequency that these activities must take place are provided in Table 3.1. Some of these activities take place at permit renewal while others only take place if the C-139 Basin is out-of-compliance. Many of these activities already take place under the current rule. Other activities are only required under the proposed rule.

Table 3.1
District Activities and Frequency Required Under the Current Rule and the Proposed Rule

Activity	Current Rule	Proposed Rule
BMP Permit Application and Issuance (every 5 years)		
1. BMP Plan Approvals to meet proposed rule - Year 1	No	Yes
2. Permit Application Review and Issuance – Year 1 & re-newals on five year periods	Yes	Yes
BMP Permit Compliance (annual)		
3. BMP Plan Field Verification – Years 1 through 10	Yes	Yes
4. BMP Annual Report Review – Years 1 through 10	Yes	Yes
5. Permit Basin Discharge Monitoring Plan Processing – Years 1 through 10	Yes	Yes
Water Quality Compliance		
6. Model development in accordance with proposed rule – Year 1 only	No	Yes
7. Performance Measure Determination at the Basin wide level – Years 1 through 10	Yes	Yes
8. Performance Measure Determination at the Sub-basin and Permit Basin level		
8a. In Years when C-139 Basin is in compliance	No	Yes
8b. In Years when C-139 Basin is out-of-compliance	Yes, permit basin level only	Yes
Other Permit Modification Applications – In Years when C-139 Basin is out-of-compliance		
9. Review of Proposed Water Quality Improvement Activities (WQIA) and Implementation	No	Yes
10. Review of Impracticability Requests	No	Yes
11. Review of Demonstration Projects with Verification Plans	No	Yes

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The additional hours needed for District staff to complete these activities are based on a comparison of whether or not each activity is required under the current rule and under the proposed rule. Also, the estimated numbers of General Permits for which the District would potentially need to address under many of these activities are estimated to be 40 under current rule and 29 under the proposed rule. This reduction in the number of General Permits will reduce the estimated hours needed for some activities such as permit application review and assistance, BMP Plan field verification, and BMP Annual Report review.

The estimated number of hours needed to complete each activity in a given year was based on the nature of the activity, whether or not General Permits are up for renewal (every 5 years), and the frequency in which the C-139 Basin is determined by the District to be out-of-compliance. The estimated number of hours and District cost associated with three different out-of-compliance frequencies is provided in this Section. Estimated costs to the District are provided when the C-139 Basin is out-of-compliance: (1) once every ten years; (2) never; and (3) three times every ten years. The first frequency represents an “average” anticipated out-of-compliance frequency, the second frequency represents a “minimum” and the third represents a “maximum”.

The District calculated the average hourly cost of engineer and scientist classifications that would most likely provide the services needed for implementation and enforcement. The average hourly cost is \$138.36 and includes salary, employee benefits and overhead.

The estimated difference in needed staff hours between the activities required by the proposed rule and those of the current rule were multiplied by this hourly cost to obtain an estimate of the cost to the District associated with the proposed rule. The results are provided in Table 3.2 under “Average” out-of-compliance frequency, Table 3.3 under “Minimum” out-of-compliance frequency and Table 3.4 under “Maximum” out-of-compliance frequency. The hours and costs are estimated each year of a 10 year period in order to demonstrate the variability of labor hours needed from year to year under the proposed rule.

Under the “Average” out-of-compliance frequency provided in Table 3.2, the one out-of-compliance year was hypothetically placed in Year 4. In reality, an out-of-compliance determination could occur in any year. The additional staff hours needed per year as a result of the proposed rule ranges from 483 to 1533 (out-of-compliance year). For seven of the 10 years, the additional staff hours is estimated to be 483. The number of full-time-equivalent staff needed to implement and enforce the proposed rule ranges from 0.26 to 0.83. The District’s annual cost of these additional staff hours ranges from

\$66,800 to \$212,100. Actual costs will depend on the frequency in which the C-139 Basin is out-of-compliance. Under the “Average” out-of-compliance frequency scenario, the average annual cost is estimated to be \$88,000 associated with 0.34 full-time-equivalent staff.

Under the “Minimum” out-of-compliance frequency provided in Table 3.3, there are no years when the C-139 Basin is out-of-compliance. The additional staff hours needed as a result of the proposed rule ranges from 483 to 808. For eight of the 10 years, the additional staff hours is estimated to be 483. The number of full-time-equivalent staff needed to implement and enforce the proposed rule ranges from 0.26 to 0.44. The District’s annual cost of these additional staff hours ranges from \$66,800 to \$111,800. Under the “Minimum” out-of-compliance frequency scenario, the average annual cost is estimated to be \$73,000 associated with 0.29 full-time-equivalent staff.

Under the “Maximum” out-of-compliance frequency provided in Table 3.4, the C-139 Basin is out-of-compliance three times every ten years. The additional staff hours needed as a result of the proposed rule ranges from 483 to 1533. The latter additional hours is needed during the three out-of-compliance years. For five of the 10 years, the additional staff hours is estimated to be 483. The number of full-time-equivalent staff needed to implement and enforce the proposed rule ranges from 0.26 to 0.83. The District’s annual cost of these additional staff hours ranges from \$66,800 to \$212,100. Under the proposed rule, additional water quality improvement activities after 2013 would be required no more frequently than every three years. Thus, this scenario represents the highest out-of-compliance frequency possible. Under the “Maximum” out-of-compliance frequency scenario, the average annual cost is estimated to be \$116,600 associated with 0.46 full-time-equivalent staff.

Table 3.2
Estimated Cost of the Proposed Rule to the South Florida Water Management District
If the C-139 Basin is Out-of-Compliance Once Every 10 Years (Average)

Item	Year										Total Every 10 Years	Average Annual
	1	2	3	4	5	6	7	8	9	10		
Out-of-compliance Years/Permit Renewal Years (a)	No/Yes	No/No	No/No	Yes/No	No/No	No/Yes	No/No	No/No	No/No	No/No		
Proposed rule, hours	5,174	3,016	3,016	4,066	3,016	4,974	3,016	3,016	3,016	3,016	35,326	3,533
Baseline, hours	4,366	2,533	2,533	2,533	2,533	4,366	2,533	2,533	2,533	2,533	28,996	2,900
Difference, hours	808	483	483	1,533	483	608	483	483	483	483	6,330	633
Labor Cost including salaries, benefits and overhead	\$111,791	\$66,825	\$66,825	\$212,098	\$66,825	\$84,120	\$66,825	\$66,825	\$66,825	\$66,825	\$875,787	\$87,579
No. of Full Time Equivalent Persons	0.44	0.26	0.26	0.83	0.26	0.33	0.26	0.26	0.26	0.26	3.44	0.34

(a) In this table, the actual year(s) when the C-139 Basin is out-of-compliance is hypothetical.

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Table 3.3
Estimated Cost of the Proposed Rule to the South Florida Water Management District
If the C-139 Basin is Never Out-of-Compliance in 10 Years (Minimum)

Item	Year										Total Every 10 Years	Average Annual
	1	2	3	4	5	6	7	8	9	10		
Out-of-compliance Years/Permit Renewal Years (a)	No/Yes	No/No	No/No	No/No	No/No	No/Yes	No/No	No/No	No/No	No/No		
Proposed rule, hours	5,174	3,016	3,016	3,016	3,016	4,974	3,016	3,016	3,016	3,016	34276	3427.6
Baseline, hours	4,366	2,533	2,533	2,533	2,533	4,366	2,533	2,533	2,533	2,533	28996	2899.6
Difference, hours	808	483	483	483	483	608	483	483	483	483	5280	528
Labor Cost including salaries, benefits and overhead	\$111,791	\$66,825	\$66,825	\$66,825	\$66,825	\$84,120	\$66,825	\$66,825	\$66,825	\$66,825	\$730,514	\$73,051
No. of Full Time Equivalent Persons	0.44	0.26	0.26	0.26	0.26	0.33	0.26	0.26	0.26	0.26	2.87	0.29

(a) In this table, the actual year(s) when the C-139 Basin is out-of-compliance is hypothetical.

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Table 3.4
Estimated Cost of the Proposed Rule to the South Florida Water Management District
If the C-139 Basin is Three Times Out-of-Compliance in 10 Years (Maximum)

Item	Year										Total Every 10 Years	Average Annual
	1	2	3	4	5	6	7	8	9	10		
Out-of-compliance Years/Permit Renewal Years (a)	No/Yes	No/No	No/No	Yes/No	No/No	No/Yes	Yes/No	No/No	No/No	Yes/No		
Proposed rule, hours	5,174	3,016	3,016	4,066	3,016	4,974	4,066	3,016	3,016	4,066	37426	3742.6
Baseline, hours	4,366	2,533	2,533	2,533	2,533	4,366	2,533	2,533	2,533	2,533	28996	2899.6
Difference, hours	808	483	483	1,533	483	608	1,533	483	483	1,533	8430	843
Labor Cost including salaries, benefits and overhead	\$111,791	\$66,825	\$66,825	\$212,098	\$66,825	\$84,120	\$212,098	\$66,825	\$66,825	\$212,098	\$1,166,333	\$116,633
No. of Full Time Equivalent Persons	0.44	0.26	0.26	0.83	0.26	0.33	0.83	0.26	0.26	0.83	4.58	0.46

(a) In this table, the actual year(s) when the C-139 Basin is out-of-compliance is hypothetical.

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3.2 Cost to Any Other State and Local Government Entities of Implementing and Enforcing the Proposed Rules

Other than entities located in the C-139 Basin that will need to comply with the proposed rule as described in Section 2.0, including the Central County Water Control District and the State of Florida, no other State or local government entity will be required to implement and enforce the proposed rule. Costs to State and local government entities as applicants and permittees are addressed as transaction costs in Section 4.0 of this Statement of Estimated Regulatory Costs.

3.3 Anticipated Effect on State or Local Revenues

The proposed rule is not expected to affect State or local government revenues.

Section 4.0

Transactional Costs

4.1 General

This Section provides estimates of the transactional costs associated with the proposed revisions to Chapter 40E-63, Part IV, "Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin. According to Chapter 120.541, Florida Statutes (2009), the Statement of Estimated Regulatory Costs shall include:

"A good faith estimate of the transactional costs likely to be incurred by individuals and entities, including local government entities, required to comply with the requirements of the rule. As used in this paragraph, "transactional costs" are direct costs that are readily ascertainable based upon standard business practices, and include filing fees, the cost of obtaining a license, the cost of equipment required to be installed or used or procedures required to be employed in complying with the rule, additional operating costs incurred, and the cost of monitoring and reporting."

These transactional costs may be incurred by property owners, farm operators and lessees whose water management systems connect to and make use of the canals, structures, and other Works of the District within the C-139 Basin. The C-139 Basin is located in northeast Hendry County, just southwest of Clewiston, Florida and Lake Okechobee.

The information regarding Transactional Costs in this SERC incorporates the best available information to assess how the rule will impact the C-139 Basin Pollutant Source Control permittees and applicants. The estimated transactional costs associated with each proposed rule revision are provided and many were normalized to cost per acre averaged over the entire property. Applicants and permittees are encouraged to use their own situation and the information and unit costs provided in this SERC to obtain an understanding of how the proposed rule will impact their own operations.

Permittees who have judiciously implemented effective best management practices (BMPs) will be least impacted by the proposed rule in terms of transactional costs. In addition, many of the BMPs that permittees will be required to implement as a result of the proposed rule may already be required under other rules, or fully or partially implemented as standard operating procedure for the agricultural operation.

4.2 Summary Description of Costs

Types of costs that may be incurred by the individuals and entities, and sections of this document where these costs are discussed are:

1. Costs by No Notice General Permittees to implement basic BMPs as described in the proposed rule. (See Section 4.3)
2. For current No Notice General permittees who would be required to apply for a General permit due to the change in requirements under the proposed rule, the permit application cost and the cost to implement additional BMPs as required under this rule would be incurred. Currently three entities have been identified that will need to apply for a General Permit under the proposed rule. (See Sections 4.4 and 4.5)
3. Costs that may be incurred by applicants for General Permits due to changes in the application requirements. (See Section 4.5)
4. Cost to General Permittees to revise their BMP Plans so that they comply with the allocation of 20 of the 35 BMP points to nutrient control practices (10 BMP points), water management practices (5 BMP points), and particulate matter and sediment control practices and/or pasture management BMPs, as applicable (5 BMP points). (See Sections 4.6 and 4.7)
5. In the event that the District determines that the C-139 Basin is out-of-compliance, permittees may incur costs to develop a plan of proposed water quality improvement activities and implement these activities. The magnitude of cost will depend on the percent total phosphorus reduction, if any, required from each permit basin. The first year when a compliance assessment can trigger water quality improvement activities is water year 2013. Additional water quality improvement activities after 2013 would be required no more frequently than every three years. (See Sections 4.6 and 4.7)
6. Cost to develop and implement a verification plan that is “a water quality monitoring program to verify the expected effectiveness of a BMP Plan or proposed water quality improvement activities in accordance with Rule 40E-63.460(4), F.A.C.” This verification plan would be required if the permittee is unable to demonstrate that the required total phosphorus reductions can be achieved based on data from the most current representative technical references including peer reviewed or published BMP research and demonstration projects, with consideration of permit basin specific conditions such as when a site-assessment is completed pursuant to 40E-63.437(2). (See Section 4.8)

7. Cost to develop and implement a Permit Basin Discharge Monitoring Program if required by the District pursuant to 40E-63.437, 40E-63.438, and 40E-63.444(1)(r). (See Section 4.8)
8. Cost to demonstrate that water quality improvement activities are impracticable, including the cost of a discharge monitoring plan, to those individuals and entities who elect to utilize this option. This option is a cost-saving benefit to permittees and applicants. (See Section 4.9.2)

The requirement that all General permittees in the C-139 Basin renew their permits within 30 days of the effective date of this proposed rule will not incur costs to these permittees relative to the current rule. This is because they were automatically granted permit extensions in 2007 in order to postpone permit renewal until this proposed rule is adopted.

The estimated transactional costs associated with each of the eight types of costs listed above are provided as follows.

4.3 Estimated BMP Costs to No Notice General Permittees

Landowners, lessees and operators who must comply with the conditions of a C-139 Basin No Notice General Permit will be required to implement the following BMPs. The property must be made available for inspection by District staff or other delegated agents within 14 days after written notice.

1. Phosphorus is only applied to correct phosphorus deficiencies based on soil or tissue testing or, for turf and landscape areas, phosphorus is only applied to meet initial establishment and growth needs (fertilizer composition less than 2% for an application rate not to exceed 0.25 lbs P_2O_5 / 1000 ft² per application nor exceed 0.50 lbs P_2O_5 / 1,000 ft² per year);
2. Fertilizer or other soil amendments containing phosphorus are not applied within 10 feet of any pond, stream, lake, water course, or any designated wetland;
3. Spill prevention practices for nutrients are implemented; and,
4. Runoff is managed in accordance with surface water or environmental resource permits, if applicable.

These BMPs are not expected to incur significant costs to No Notice General permittees. The nutrient management BMPs (1, 2, and 3, above) require minimal application of

phosphorus nutrients and implementation of spill prevention practices and, thus, do not require any particular purchase of materials or additional labor requirements. Regarding water management BMPs (4, above), the requirement consists of maintaining compliance with current surface water or environmental resource permits, so there is no additional cost associated with the proposed rule.

In the event that a soil and/or plant tissue test is needed to correct phosphorus deficiencies, the current cost per standard soil fertility test conducted by the University of Florida, Institute of Food and Agricultural Sciences (IFAS) is \$7. This test determines pH, lime requirement, P, K, Ca, and Mg. The plant tissue analysis is also conducted by IFAS and the cost is \$10 per test. Plant tissue analysis includes: N, P, K, Ca, and Mg (in percent); and B, Cu, Fe, Mn, and Zn (in ppm) The Hendry County Cooperative Extension Office in LaBelle, Florida will mail the sample or samples to IFAS for testing and will assist in interpreting the results. These costs are applicable to all types of No Notice General Permittees, including agricultural operations and homeowners.

4.4 Current No Notice General Permittees Required to Apply for a General Permit

Owners of land parcels 40 acres or larger under the same ownership that are not inactive will be required to obtain a General permit. Under current rule, land uses not in agriculture are not required to have a General Permit. The term inactive means “land parcels that are not used for agriculture, urban, commercial, industrial or other development, as determined by the District. It also includes lands in their undeveloped native state (unless used as pastures)”.

In the event that a No Notice General Permittee under the current rule would be required to obtain a General permit under the proposed rule, the land owner would need to apply for a General Permit and pay the permit application processing fee. The permit application processing fees are \$250 for a new permit, \$250 for a renewal permit, \$100 for a permit modification and \$100 for a permit transfer. The applicant will also be required to implement BMPs specified in Appendix B1 of the proposed rule and comply with all requirements of the proposed rule which are described and quantified in this Section. Please refer to section 4.6 regarding a discussion of potential BMP implementation costs for entities covered by No Notice General permits under the current rule that would be required to obtain General permits under the proposed rule.

4.5 Costs Due to Changes in General Permit Application Requirements

Some changes to the requirements for General Permit applications may incur costs to individuals and entities. These costs were estimated and are provided in Table 4.1 for each proposed change. Actual costs may differ from those presented in this table to the

extent that the hourly wage rate, the multiplier to account for employment benefits and overhead, and/or the hours required for the applicant to address the requirement are different from the values provided. The cost estimates provided in the Table attempt to consider the most common anticipated activities of the applicant.

Table 4.1
Estimated Costs to Comply with Changes in General Permit Application Requirements

Proposed Requirement	Number of Hours		Cost per Hour (a)	Total Cost	
	Low	High		Low	High
Delineation of "drainage features depicting the hydrologic drainage area, general direction of flow, inflow points, and discharge points off-site for delineation of Permit Basins"	0 (b)	8	\$47.18	\$0	\$377
Notification and Certification that lessees have received a copy of the permit and agree to implement the BMP Plan and be bound by the terms and conditions of the permit, including any amendments.	0 (c)	4	\$47.18	\$0	\$189
If the permittee applies materials that contain phosphorus, such as biosolids, water quality monitoring data may be required by the District to demonstrate no potential impacts on phosphorus loading.	See Section 4.8 for an estimated cost to implement a Permit Basin Discharge Monitoring Program. Estimated cost is \$5.26 per acre represented by the monitoring site.				

(a) Actual cost per hour will vary depending on the wages or salaries of those who provide the services. An average hourly wage rate of \$15.73 is used times a factor of 3.0 to account for employee salary/wages, employee benefits and overhead. The \$15.73 per hour wage rate represents the median hourly wage rate of all full-time employees in Florida in 2006 and is from Florida Statistical Abstract, 2008, Table 6.13, Wages: Median Weekly Earnings of Full-time Wage and Salary Workers by Sex in Florida, Other Sunbelt States, and the United States, 2006, page 275, University of Florida, Bureau of Economic and Business Research. The 3.0 factor is from Hazen and Sawyer in-house sources.

(b) The existing delineation as described in the permit or based on post-permit compliance inspections or the hydrologic evaluation conducted by the District may be sufficient or changes may be required as part of an ERP permit. Therefore, the landowner may not be required to submit any additional information as a result of the proposed rule.

(c) The cost would be \$0 if the landowner does not have a lessee or the lessee is a co-applicant.

4.6 General Permittee Revisions to the BMP Plan and Implementation of Water Quality Improvement Activities

There are two situations when General permittees will need to make changes to their BMP Plan and/or implement additional BMPs. The first situation is immediately after adoption of the proposed rule and the second situation is when the District finds that the

C-139 Basin was not in compliance with the Everglades Forever Act during the previous year. Each situation is discussed in turn.

Revise the Permittee's BMP Plan. Upon adoption of the proposed rule, General Permittees will need revise their BMP Plans so that they comply with the allocation of 20 of the 35 BMP points to nutrient control practices (10 BMP points), water management practices (5 BMP points), and particulate matter and sediment control practices and/or pasture management BMPs, as applicable (5 BMP points).

The approved BMP Plan must be fully implemented with 90 days from the effective date of the proposed rule except under certain circumstances as described in the rule. The cost to these permittees will vary depending on each permittee's current allocation of BMP points among BMP categories in their existing BMP Plans.

The District reviewed the currently permitted BMP Plans in the C-139 Basin and BMP inspection reports and data to determine the BMPs that are likely implemented but not claimed for BMP credit under the current permit. The District concluded that some of these BMPs may already be implemented in some of the permit basins but not documented, and that some BMPs may be partially implemented. Examples of partial implementation are described below:

- Control discharge structures exist to provide water management detention. However, there is no assurance that water table levels are followed to optimize runoff storage and reduce total phosphorus loading in discharges.
- Soil tests are being conducted to determine the phosphorus nutrients in the soil. However, there is no assurance that standard phosphorus application recommendations are used or that there is technical documentation to justify that any deviations from those recommendations do not result in excess application of phosphorus fertilizers.

The District determined certain assumptions establishing a low- to high-cost range scenario based on best professional judgment and the post permit compliance data described above. These estimated costs per acre, the additional BMPs, and the acres associated with these additional BMPs are provided in Table 4.2.

Table 4.2
Estimated Costs of Additional BMPs That May Need to Be Implemented
By General Permittees At Permit Renewal After Proposed Rule Adopted

Land Uses or Crops	Additional BMPs Identified	Cost per Acre	Acres - Current General Permits	Acres Affected by Additional Cost		Total Cost Range	
				Low End	High End	Low End	High End
Pasture	Water Resources Management for Pasture	\$1.17	72,944	0	24,072	\$0	\$28,050
	Sub-total Pasture					\$0	\$28,050
Sugarcane	Nutrient Application Control	\$0.00	4,152	0	0	\$0	\$0
	Nutrient Spill Prevention	\$0.00				\$0	\$0
	Nutrient Application Based on Soil Testing	\$0.00				\$0	\$0
	Sub-total Sugarcane					\$0	\$0
Citrus Groves	Nutrient Application Control	\$6.11	15,559	0	7,780	\$0	\$47,494
	Nutrient Spill Prevention	\$0.55				\$0	\$4,279
	Nutrient Application Based on Soil Testing	\$0.00				\$0	\$0
	Particulate Matter and Sediment Controls	\$8.48				\$0	\$65,970
	Sub-total Citrus Groves					\$0	\$117,743
Vegetables	Nutrient Application Control	\$6.11	28,169	5,634	22,535	\$34,423	\$137,690
	Nutrient Spill Prevention	\$0.55				\$3,099	\$12,394
	Nutrient Application Based on Soil Testing	\$5.50				\$30,986	\$123,944
	Particulate Matter and Sediment Controls	\$6.92				\$0	\$155,944
	Sub-total Vegetables					\$68,507	\$429,972
TOTAL			120,824	5,634	54,386	\$68,507	\$575,764
Average Cost per Acre						\$0.57	\$4.77

Pasture. In Table 4.2, the additional BMP called “Water Resources Management for Pasture” consists of a combination of water conservation and management practices considering the requirements of the primary forage grasses and supplemental cattle watering and/or managing surface water via pump or controlled gravity structures to detain a minimum of ¼ inch of rain within soils, wetlands, canals and ditches. Under the low

end, it is assumed that all 17 farms and ranches already have sufficient control structure capability to manage water flows. Under the high end, it is assumed that, of the 17 ranches 2/3, or 11 of these ranches, have control discharge structures, and that 1/3, or six of these ranches, have uncontrolled structures (open water connections.) At these six ranches, infrastructure improvements may be required to provide water management detention. The estimated average cost to add a control discharge structure is about \$5,000 for each individual farm or ranch. For the 11 farms and ranches that already have these structures, the estimated cost is minimal. In the table, the cost is normalized to cost per farm acre by multiplying \$5,000 by the 17 farms and ranches and dividing by the 72,944 acres in pasture.

Sugarcane. Based on a review of BMP implementation on sugarcane farms in the C-139 Basin, the additional BMPs (nutrient application control, nutrient spill prevention, nutrient application based on soil test) are being implemented consistent with the proposed rule, even though these BMPs may not be included in the existing permitted BMP Plan. The sugarcane farms expected to need revisions to their permitted BMP Plan have above ground impoundments (AGIs), therefore it is expected that these permittees will be able to use these AGIs to qualify for particulate matter and sediment control BMP points. No additional costs to sugarcane operations are anticipated under the low or high end scenarios.

Citrus Groves. Based on a review of BMP implementation on citrus groves in the C-139 Basin, nutrient BMPs (nutrient application control, nutrient spill prevention, nutrient application based on soil test and/or plant tissue analysis) are expected to be implemented in the majority of groves. Under the low end scenario, no additional costs are anticipated. Under the high end scenario, partial additional costs (50 percent of the nutrient application control cost reported in Table 4.4 of \$12.21 per farm acre) may be required for 50 percent of the groves. As all groves in the C-139 Basin have AGIs, it is expected that these permittees will be able to use these AGIs to qualify for particulate matter and sediment control BMP points. However, canal cleaning and aquatic weed control BMPs may be required for 50 percent of these groves with AGIs under the high end scenario assuming that the AGI discharges into an internal canal or ditch prior to off-site discharge.

Vegetables. Based on a review of BMP implementation on vegetable farms in the C-139 Basin, nutrient BMPs appear to be partially implemented. Soil samples may be collected but their frequencies and nutrient recommendation methods may need to be improved. It is assumed that, under the low end scenario, 20 percent of the farms will incur additional costs equal to 50 percent of the cost the nutrient application based on soil testing BMP and 50 percent of the cost of the nutrient application control BMP. Both costs can be found in Table 4.4. For the vegetables farms that have above ground impoundments, it is expected that permittees will qualify for particulate matter and sedi-

ment control BMP points for the AGI under the low end scenario. Under the high end scenario, 80 percent of the farms will be required to incur additional costs equal to 50 percent of the nutrient application based on soil testing BMP and 50 percent of the cost of the nutrient application control BMP.

The total estimated cost across the entire C-139 Basin to implement the additional BMPs to be replaced in the BMP Plan, as required under the proposed rule, ranges from \$69,000 per year to \$576,000 per year. The actual cost is expected to be within this range and will depend on the extent to which the farms and ranches in the C-139 Basin are already implementing the additional required BMPs either to comply with other rules or as standard operating procedure. Basin-wide, the average additional cost per acre per year ranges from \$0.57 to \$4.77.

The estimated costs of the BMPs listed in the proposed Appendix B1 are provided in the following section. The transactional costs to permittees as they amend their BMP Plans will vary significantly among permittees based on size of the property, land use, the current level of implementation, and extent to which additional BMPs would need to be implemented in order to comply with the proposed rule.

Other land uses. As indicated in section 4.4, three entities covered under No Notice general permits under the current rule will be required to implement a BMP Plan under a General permit under the proposed rule. There are no significant costs anticipated based on the proposed rule, as described below:

- Eckerd Family Youth Alternatives, Inc. is served by a permitted surface water management system, which should provide BMP credit to meet water management and particulate matter and sediment control requirements. Implementation of a basic level of nutrient management BMPs, in accordance with the Turf and Landscape rule, shall be sufficient to meet the nutrient management BMP requirements of the proposed rule.
- The Central County Water Control District and Weekly Brothers Leasing, LTD are served by a permitted surface water management system, thus should be sufficient to meet water management and particulate matter and sediment control requirements. Application of nutrients by the Central County Water Control District, if any, is expected to be incidental to meet a minimal level of landscape in common areas. Lands under Weekly Brothers Leasing, LTD, are classified as native pastures, thus BMP credit due to no land application of nutrients (or minimal on a maintenance level every seven years as provided by this BMP under the current rule) is anticipated.

Permittee Implementation of Water Quality Improvement Activities. Each water year¹ upon rule adoption, the District will determine if the C-139 Basin was in compliance with the basin wide water quality performance measures established in the rule during the previous year. If the District determines that the C-139 Basin was not in compliance, then the District will identify the extent to which each of the sub-Basins² was out-of-compliance using the method described in the proposed rule.

For those sub-basins that are out-of-compliance, the District will identify the extent to which permit basins exceed the proportional share of the phosphorus load. For the permit basins that are out-of-compliance, the District will determine the required total phosphorus reduction level for each of these permit basins. For these permit basins, the permittees will need to implement “water quality improvement activities” which is defined in the proposed rule as a combination of modifications to a BMP Plan proposed by a permittee to meet the required total phosphorus reduction requirements. Improvement activities may include revising implementation methods to increase the effectiveness of existing BMPs or implementing additional BMPs.

According to the District’s Guidebook for Preparing an Application for a C-139 Basin Pollutant Source Control Permit, incorporated by reference in the proposed rule, water quality improvement activities (WQIAs) shall be identified as follows:

“If the C-139 Basin is determined to be out of compliance, the permittee shall submit an application for a letter modification within 120 days from the District’s transmittal of the notice that the C-139 Basin is not in compliance. The letter modification application shall propose WQIAs along with the proposed total phosphorus reductions to be achieved. Three options are available to estimate the proposed total phosphorus reductions:

1. Most current representative technical references such as peer reviewed or published BMP research and demonstration projects,
2. A verification plan,
3. District criteria based on most current representative technical references (see Appendix D).” Appendix D is located in the District’s Guidebook.

¹ “Water Year (WY)” means the 12-month period beginning on May 1 and ending on the following April 30.

² “Sub-basin” is “an area of land determined by the District based upon District to represent all discharges to District monitoring locations, based upon hydrologic mapping and permittee-submitted information”.

Appendix D of the Guidebook includes “Table D.1: Total Phosphorus Removal Efficiency Criteria”, which lists the BMPs provided in Appendix B1 and the corresponding total phosphorus removal efficiencies and criteria for determination of total phosphorus removal efficiency.

The first year that can result in additional activities after an out-of-compliance determination is water year 2013, as specified in the proposed Rule. Additional water quality improvement activities after 2013 would be required no more frequently than every three years.

Under the proposed rule, in Section 40E-63.446 C-139 Basin Compliance, F.A.C., the requirement for water quality improvement activities in a permit basin will not be required in a water year if the District determines that one or more of following situations exist:

- (a) The permit basin is located in a sub-basin that is determined to not exceed its proportional share of the basin-wide loading based on District-collected data for the sub-basin or, if applicable, its Permit Basin Discharge Monitoring Program results are determined not to exceed the proportional share in accordance with Appendix B3.1, incorporated by reference in subsection 40E-63.446(2), F.A.C.
- (b) District approved early BMPs, as described in subsection 40E-63.438(1)(a), F.A.C., were fully implemented in the permit basin during a water year that was used to deem the C-139 Basin out-of-compliance (this provision applies only to the parcels where the early BMPs apply).
- (c) A District approved BMP Demonstration Project, including a verification plan, as described in 40E-63.438(1)(b), F.A.C., was conducted within the permit basin during a water year that was used to deem the Basin out-of-compliance (this provision applies only to the land uses or crops to which the project applies).
- (d) The permit basin, or portion thereof, has been issued and meets the conditions of a determination of impracticability as described in subsection 40E-63.461(6), F.A.C. (this provision applies to the land where the determination applies).
- (e) The performance measure determination includes the permit basin UAL from either of the two water years immediately following a water year for which the permit basin was required to implement water quality improvement activities.

The District will provide written notice to permittees regarding the C-139 Basin compliance results. Notice will also include whether water quality improvement activities are required of the permittee. The District shall transmit the written notices no later than Au-

gust of each year. The notices shall describe permittees' required actions for proposing water quality improvement activities based on these assessments.

If the C-139 Basin is determined to be out-of-compliance with the water quality requirements of Part IV pursuant to 40E-63.446, F.A.C., the permittee shall propose water quality improvement activities as follows.

(a) The permittee shall submit a letter modification application for the District's consideration, within 120 days of the District's transmittal of the notice that the C-139 Basin is not in compliance. The submittal shall include the section entitled "Water Quality Improvement Activities" of Form 1045.

(b) The submittal shall include a proposal for water quality improvement activities along with the estimated phosphorus reductions to be achieved in accordance with 40E-63.461(3), F.A.C. Instead of providing estimates of phosphorus reduction, the permittee may submit a verification plan in accordance with 40E-63.461(4), F.A.C. The phosphorus reductions shall be the minimum levels necessary to meet the permit basin's proportional share of required total phosphorus reductions as determined by the District.

The proposal shall include a schedule to ensure that full implementation of an approved BMP Plan incorporating any proposed water quality improvement activities is in effect as soon as feasible and no later than April 30 following the District's transmittal of the notice that the C-139 Basin is not in compliance. A permittee's alternate implementation schedule may be approved by the District with justification based on the scope of the proposed activities. A permittee shall be required to implement intermediate water quality improvement activities or BMPs, as applicable, if an alternate implementation schedule is approved.

The actual additional BMPs that are implemented by permittees as a result of non-compliance with the Everglades Forever Act, as described above, would depend on the extent to which phosphorus loads would need to be reduced in each permit basin. In the event that no additional BMPs and activities or refinements for the reduction of phosphorus can be reasonably accomplished at the site or sites of operation, the permittee may apply to the District for a determination of impracticability, as described in the proposed rule. If impracticability is approved by the District, the permittee would need to implement a discharge monitoring program as described in the proposed rule.

The estimated costs of the BMPs listed in Appendix B1 of the proposed rule are provided in the following section. As indicated in Section 1 of this SERC, the BMPs listed under the current and the proposed rule are the same with few exceptions where BMP names or definitions were clarified. This list of BMPs provides the basis for identifying water quality improvement activities. The transactional costs to C-139 Basin Pollutant

Source Control General permittees as they implement additional water quality improvement activities will vary significantly among permittees based on the degree to which their permit basin is out of compliance as measured by the required total phosphorus reduction level, the size of the property, the hydrologic characteristics of the property, and the land use.

4.7 Estimated Costs of Best Management Practices

The BMPs that may be implemented by General permittees if water quality improvement activities are required include but is not limited to those listed in Appendix B1 of the proposed rule. In many cases it is expected that water quality improvement activities will consist of optimized methods of already permitted BMPs.

The BMPs of Appendix B-1 are organized into five categories:

- Nutrient Control Practices
- Water Management Practices
- Particulate Matter and Sediment Controls
- Pasture Management – These BMPs can provide equivalent points towards the Particulate Matter and Sediment Control Practices category.
- Other – Permittees may seek approval for an equivalent alternative through the District permit process as described in the proposed 40E-63.437 “Alternative BMP Plans”.

For the purposes of this SERC, the estimated costs of all BMPs listed in Appendix B1 of the proposed rule are provided in this sub-section for a complete overview. However, not all BMPs may be applicable to the C-139 Basin conditions, or they may have already been implemented under the BMP Plan criteria.

Nutrient Control Practices BMPs. The list of nutrient control practices BMPs included in Appendix B1 of the proposed rule is provided in Table 4.3. The estimated costs to implement these BMPs are provided in Tables 4.4 through 4.6.

Table 4.3
Nutrient Control Practices Listed in Appendix B1 of Proposed Rule

Best Management Practice (BMP)	Description
Nutrient Application Control - 2.5 points	Uniform and controlled boundary application of nutrients with a minimum 4' setback from canals with no overlapping application for each application method (e.g. banding at the root zone or side-dressing, pneumatic controlled-edge application such as AIRMAX);
	Fertilization through low volume irrigation system applied at root zone (fertigation); controlled placement by fertilization under plastic near root.
Nutrient Spill Prevention - 2.5 points	Formal spill prevention protocols (storage, handling, transfer, and education / instruction). For pasture, also includes restricted placement of stored feed and housekeeping to prevent spillage near storage and transfer areas (feed and molasses).
Manage Successive Vegetable Planting to Minimize P - 2.5 points	Avoid successive planting of vegetables or other crops having high phosphorus needs to avoid phosphorus build up in soils. Includes successive planting with no successive phosphorus application.
Recommended Nutrient Application based on Plant Tissue Analysis	Avoid excess application of phosphorus by determining plant nutrient requirements for adjustments during next growing season (crop specific). 2.5 points
	Pastures with Bahia grass – Plant tissue analysis along with soil test is required to make nutrient application recommendation. 2.5 points
	Citrus – Results are applied to the current season phosphorus requirements. 5 points
Recommended Nutrient Application based on Soil Testing – 5 points	Avoid excess nutrient application by determining phosphorus requirements of soil and follow standard recommendations for application rates (crop specific), or recommendations based on the analysis of optimum economic crop response to added phosphorus specific to the soil and crop. The disposal or application of waste water residuals (biosolids), animal manure, or other materials containing phosphorus shall not exceed the phosphorus requirements of the crop.
Split Nutrient Application – 5 points	More efficient plant uptake of phosphorus by applying small portions of total recommended phosphorus at various times during the growing season. Not to exceed total recommendation based on soil test.
Slow Release P Fertilizer – 5 points	Avoid flushing excess phosphorus from soil by using specially treated fertilizer that releases phosphorus to the plant over time.

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Table 4.3
Nutrient Control Practices Listed in Appendix B1 of Proposed Rule

Best Management Practice (BMP)	Description
Reduce Phosphorus Fertilization - 5 points	Reduce the phosphorus application rate by at least 30% below standard recommendations based on soil tests and development of site – specific (reduced) recommendations or application methods. Provide basis for reduction credit.
No Nutrients Imported Via Direct Land Application – 20 points	No Application of phosphorus, in any form, to the soil for amendments or plant nutrients. Pastures can claim this BMP and still apply fertilizer if done at maintenance or less than optimum production levels no more frequently than once every 6 years. Not applicable to new plantings.
No Nutrients Imported Indirectly Through Cattle Feed – 15 points	No phosphorus import to the basin through cattle feed (Pastures where no nutrients are imported via direct land application can claim this BMP if the only feed additives are mineral supplements or molasses.) Cost is similar to net income impact of reduced cattle stocking rate.
Nutrient Management Plan – 5 to 25 points	A plan to manage the amount, source, placement, form and timing of nutrient application to optimize yields and minimize the movement of phosphorus nutrients to surface and ground waters that ultimately discharge off-site. (See Text for additional description)

A Nutrient Management Plan is listed in the last row of Table 4.3. According to Appendix B1 of the proposed rule, the Nutrient Management Plan is:

“a plan to manage the amount, source, placement, form, and timing of nutrient application to optimize yields and minimize the movement of phosphorus nutrients to surface and ground waters that ultimately discharge off-site. A site management plan and budget for tracking phosphorus shall be developed. The plan shall consider all nutrient sources (including but not limited to soil residual, crop residual, animal residual, organic and chemical fertilizer, soil amendments and supplements, irrigation water quantity and timing, animal nutrient supplements) versus the required amounts of nutrients. The plan shall utilize testing, analysis, and agricultural industry standards to determine nutrient needs. At a minimum, the plan shall address the timing, placement and method of nutrient application; optimization of nutrient uptake; prevention of nutrient movement off-site; site descriptions such as aerial photographs, crop maps, and soil maps; implementation plans and schedules; sediment control BMPs; pasture management BMPs; and water quality monitoring for input into the mass balance prepared for the phosphorus budget. These actions shall be developed in accordance with

Section IV, Code 590 of the United States Department of Agriculture Natural Resources Conservation Service Conservation Practice Standard, NE-T.G. Notice 600, January 2009, hereby incorporated by reference. The Plan must be approved by NRCS or a qualified technical service provider. However, other alternatives may be considered by the District with technical justification. A Nutrient Management Plan can be a component of a Conservation Plan which includes the objective of reducing phosphorus discharges on lands with cattle operations. The District will assign BMP points to each Nutrient Management Plan based on the relative level of treatment proposed, as evidenced by the applicant through plans, test results or other information submitted with the application.”

Section IV, Code 590 of the United States Department of Agriculture Natural Resources Conservation Service Conservation Practice Standard, NE-T.G. Notice 600, January 2009 is provided in Appendix A of this SERC.

The estimated costs provided in Table 4.4 are expressed as annualized installation and O&M costs per farm acre. The total estimated annual cost for a 300 acre farm and a 2,500 acre farm are also provided.³ The total annual cost is calculated as the annualized cost per acre times the number of acres.

³ Under the proposed rule, all but two of the General permittees are agricultural operations. The land area of the General permittees located in the C-139 Basin range from 121 acres to 53,024 with a median land size of 2,560 acres.

Table 4.4
Nutrient Control Practices - Estimated Costs of BMPs
To Minimize Phosphorus Loads to C-139 Works of the District, 2010 dollars

BMPs	Annual Cost per Farm Acre	Annual Cost – 300 Acre Permit	Annual Cost – 2,500 Acre Permit
Reduced Phosphorus Fertilization (soil and plant tissue testing, split applications, fertilizer placement and type): (a)			
Improved, Unimproved, Rangeland and Wooded Pasture, Sod / Turf Grass	\$2.20	\$660	\$5,500
Row Crops (vegetables), Ornamentals	\$11.00	\$3,300	\$27,500
Citrus and Sugarcane (b)	\$0.00	\$0	\$0
Nutrient Spill Prevention (c)	\$0.55	\$166	\$1,383
Nutrient Application Control - Fertilization through low volume irrigation system applied at root zone (fertigation); controlled placement by fertilization under plastic near root. (d)	\$12.21	\$3,662	\$30,515
No Nutrients Imported Indirectly Through Cattle Feed – Cost is similar to net income impact of reduced cattle stocking rate. (e)	\$66.28	\$19,884	\$165,698
No Nutrients Imported Via Direct Land Application	No cost, assuming no loss in production		
Nutrient Management Plan	Cost will vary based on contents of plan. See cost of individual measures in these cost tables.		
Manage Successive Vegetable Planting to Minimize Phosphorus Application	Cost will vary depending on vegetable type and net returns.		

(a) From South Florida WMD, St. Lucie River Watershed Protection Plan, Appendix B prepared by Soil and Water Engineering Technology, Inc., January 2009, pages B-5 through B-13. Costs are net of fertilizer cost savings.

(b) Cost associated with reduced phosphorus applications is usually less than the fertilizer cost saving because no negative impacts to the crops are expected.

(c) For each 100 acres, 1 hour per year for farm labor education and implementation at \$11.06 per hour and 1 hour per year for farm mgmt planning and education at \$22.12 per hour.

(d) See Table 4.5.

(e) See Table 4.6.

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Documentation of the estimated costs for all but two of the nutrient control practices BMPs are provided in Table 4.4. For the two BMPs that are not, the itemized estimated costs of the nutrient application control BMP and the no nutrients imported indirectly through cattle feed BMP are provided in Tables 4.5 and 4.6. The estimated change in net revenue from the BMP called no nutrients imported indirectly through cattle feed will be similar to the effect of reducing cattle stocking rates from about 1.33 head per 2 acres to 1 head to 2 acres.⁴ The estimated net income reduction from reducing the cattle stocking rate is provided in Table 4.6. However, based on the reported practices by cattle operations in the C-139 Basin, 100 percent report that they do not provide feed to their cattle or they maintain a low cattle density of about 1 head per two acres, or they implement both practices. Thus, none of the existing cattle operations are expected to incur the net income reduction provided in Table 4.4.

Table 4.5
Estimated Cost to Fertilize Through Low Volume Irrigation System

Item	Units	Cost per Unit	No. of Units	Total Cost
Injection Equipment Purchase and Installation (a)	Farm Acres	\$75	300	\$22,500
Total Cost amortized over 10 years at 10% interest				\$3,662
Annualized Cost per Farm Acre (b)				\$12.21

(a) Cost per Acre from Del Bottcher, Soil and Water Engineering Technology, Inc., April 23, 2010. Assumes that the low volume irrigation system is already in place.

(b) Annual O&M cost is \$0 because it is less expensive to apply fertilizer through the irrigation system than to apply mechanically.

⁴From Dr. Del Bottcher, President, Soil and Water Engineering Technology, Inc., Gainesville, Florida, April 23, 2010.

Table 4.6
Change in Net Revenue from Reduced Stocking Rate
Or No Nutrients Imported Indirectly Through Cattle Feed

NOTE: Existing C-139 Basin Cattle Operations Do Not Import Nutrients Through Cattle Feed or Their Cattle Stocking Rate is Already Consistent with the Cattle Stocking Rate BMP (a)

Item	Baseline	Cattle Stocking Rate BMP
	(1.33 head per 2 acres)	(1 head per 2 acres)
Cow Density (cows / acre)	0.67	0.50
Sale Price per Pound (weighted average calf and cull) (a)	\$1.16	\$1.16
Pounds Sold Annually Per Acre (b)	260.60	195.94
Marginal Cost per Cow Per Year (c)	\$54.36	\$54.36
Total Revenue per Acre	\$303.28	\$228.03
Total Marginal Cost per Acre	\$36.15	\$27.18
Net Revenue Per Acre Per Year	\$267.14	\$200.86
Difference in Net Revenue Per Acre		-\$66.28

(a) From Florida Agricultural Statistics Service, "Livestock, Dairy, Poultry Summary, 2008", page 30, nass-fl@nass.usda.gov

(b) From South Florida Water Management District, LOADSS Update and Verification Project Report, prepared by Soil and Water Engineering Technology, Inc., January 1999, Task 5 - page 11.

(c) Marginal cost is cost of minerals and molasses per cow per year from LOADSS. Amount of minerals and molasses per cow per year from Table 3A, Task 5- page 13, LOADSS Update and Verification Project Report, Contract C-7611, Final Report for the South Florida Water Management District, submitted by Soil and Water Engineering Technology, Inc., January 1999. See also USDA, 2008 Costs per Bred Cow - Supplemental Feed cost is \$31 to \$54 per bred cow, depending on area of the United States.

Water Management Practices BMPs. The list of water management practices BMPs included in Appendix B1 of the proposed rule that are related to water retention or detention is provided in Table 4.7.

Table 4.7
Water Management Practices Related to Water Retention and Detention Listed
In Appendix B1 of Proposed Rule

Best Management Practice (BMP)	Description
Improvements to Water Management System Infrastructure to Further Increase Water Quality Treatment by Delayed or Minimized Discharge - 5 points	Recirculation of water inside farm boundaries to improve water quality prior to off-site discharge includes: fallow field flood water with no direct discharge (instead dispose of via evapotranspiration, seepage, use as irrigation water); or Increasing water detention using properly constructed canal berms.
½ Inch Detained – 5 points	Delayed discharge (based on measuring daily rain events using a rain gage).
1 Inch Detained - 10 points	Delayed discharge (based on measuring daily rain events using a rain gage).
Water Resources Management for Pastures – 5 points	Combination of water conservation and management practices considering the requirements of the primary forage grasses and supplemental cattle watering. Managing surface water via pump or controlled gravity structures to detain a minimum of ¼ inch of rain within soils, wetlands, canals and ditches.
Approved and Operational Surface Water Reservoir (Certified) – 10, 10 and 15 points	Properly permitted, constructed and maintained storage system meeting specified Environmental Resource Permit (ERP) Basis of Review criteria (version in effect at the time of permitting or in effect at the time of permit modification for modified systems): System meets Section 5.2.1 Water Quality Criteria-Volumetric Requirements System meets Section 6.2 Water Quantity Criteria-Discharge Rate System meets Section 6.3 Water Quantity Criteria-Design Storm (Must have a valid SFWMD construction and operation permit for the surface water system.)
Temporary Holding Pond – 15 points	Temporary agricultural activities (as described in Chapter 40E-400, FAC.) with a properly constructed and permitted temporary holding pond.
Overland Sheet Flow over Entire Property – 15 points	No drainage improvements made to a land area so that it drains through overland sheet flow, or drainage improvements such as ditches have been removed to restore overland sheet flow drainage to the land area.
No Point Discharge of Surface Water – 15 points	Voluntarily disabling of offsite discharge structures or other permanent means to prevent point discharge from a land area.

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The estimated costs to implement these water management practices BMPs related to retention and detention are provided in Table 4.8. The estimated costs are expressed as annualized installation and O&M costs per farm acre. The total estimated annual cost for a 300 acre farm and a 2,500 acre farm are also provided. The total annual cost is calculated as the annualized cost per acre times the number of acres.

Table 4.8
Water Management Practices related to Water Retention and Detention
Estimated Costs of BMPs to Minimize Phosphorus Loads
To C-139 Works of the District, 2010 dollars

BMPs	Annual Cost per Farm Acre	Annual Cost – 300 Acre Permit	Annual Cost – 2,500 Acre Permit
Off-Season In-Field Retention (b)	\$3.52	\$1,056	\$8,800
Wetland Restoration: (b)			
All Pastures, Row Crops, Sod/Turf Grass, Sugarcane	\$3.52	\$1,056	\$8,800
Citrus	\$14.08	\$4,224	\$35,200
Water Management (irrigation and drainage with riser board control for row crops/sod/turf grass/ornamentals and with in-field retention for sugarcane) (b)	\$7.04	\$2,112	\$17,600
Stormwater Retention / Detention: (b)			
Improved Pasture	\$14.08	\$4,224	\$35,200
Unimproved Pasture, Rangeland and Wooded Pasture	\$7.04	\$2,112	\$17,600
Row Crops (vegetables) / Ornamentals	\$70.40	\$21,120	\$176,000
Sugarcane	\$35.20	\$10,560	\$88,000
Citrus	\$140.80	\$42,240	\$352,000
Sod / Turf	\$35.20	\$10,560	\$88,000
Temporary Holding Pond	Cost will vary significantly based on pond size, depth and use and hydrologic characteristics of the property.		
Overland Sheet Flow over Entire Property	Cost will vary significantly based on extent to which drainage improvements would need to be made and amount of land taken out of production. Land may become more wet, more often and less productive. These BMPs would only be implemented if they do not significantly affect land productivity and net income.		
No Point Discharge of Surface Water			

(a) Properly permitted, constructed and maintained storage system meeting specified Environmental Resource Permit (ERP) Basis of Review criteria (version in effect at the time of permitting or in effect at the time of permit modification for modified systems).

(b) From South Florida WMD, St. Lucie River Watershed Protection Plan, Appendix B prepared by Soil and Water Engineering Technology, Inc., January 2009, pages B-5 through B-13.

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The list of water management practices BMPs included in Appendix B1 of the proposed rule that are related to irrigation is provided in Table 4.9.

Table 4.9
Water Management Practices Related to Irrigation Listed in Appendix B1 of Proposed Rule

BMPs	Description
Low Volume Irrigation – 5 points	Use of low volume irrigation methods, e.g. drip irrigation, microjet irrigation.
Tailwater Recovery System – 10 points	A planned irrigation system in which facilities have been installed and the system is operated to collect, store, and transport irrigation tailwater and/or rainfall runoff that would have been discharged offsite without the system.
Precision Irrigation Scheduling – 10 points	Combination of low volume irrigation and soil-moisture measuring equipment, specialized irrigation decision tools (e.g. computer software), and/or remote sensing tools to ascertain real-time crop needs to maximize irrigation system performance and to develop precise irrigation scheduling (time, location and amount).

The estimated costs to implement these irrigation-related BMPs are provided in Table 4.10. The itemized estimated costs associated with Tailwater Recovery, including pond construction, presented in Table 4.10, are provided in Table 4.11.

Table 4.10
Water Management Practices Related to Irrigation - Estimated Costs
Of BMPs to Minimize Phosphorus Loads to C-139 Works of the District
2010 dollars

Best Management Practice (BMP)	Annual Cost per Farm Acre	Annual Cost – 300 Acre Permit	Annual Cost – 2,500 Acre Permit
Tailwater Recovery from Retention / Detention Ponds. Existing ponds are used. (b)	\$10.56	\$3,168	\$26,400
Tailwater Recovery System including pond construction (c)	\$161	\$48,369	\$403,078
Low Volume Irrigation (a)	\$155	\$46,392	\$386,599
Precision Irrigation Scheduling - On-Farm Decision Support System, Water Flow Meters and Soil Moisture Monitoring System (d)	\$60	\$17,898	\$149,152

(a) See Table 4.11, Tailwater Recovery.

(b) From South Florida WMD, St. Lucie River Watershed Protection Plan, Appendix B prepared by Soil and Water Engineering Technology, Inc., January 2009, pages B-5 through B-13.

(c) See Table 4.12 and Table 4.13, Low Volume Irrigation.

(d) See Table 4.14, Precision Irrigation System.

Table 4.11
Estimated Cost of a Tailwater Recovery System, Including Pond Excavation

Item	Value
Number of Acres	300
% of Acres That is Tailwater Recovery Pond (a)	0.02
Total Acres of Tailwater Recovery Pond	6.0
Excavation Cost per Cubic Yard (EQIP EXMAT), 2007 dollars (b)	\$3.50
Cubic Yards Excavated	82,442
Total Excavation Cost, 2007 dollars	\$288,549
Shaping Cost per Acre-Foot (Light) (EQIP EXMAT) (b)	\$660
Acre-Feet Shaped	51.10
Total Shaping Cost	\$33,726
Filter, self-cleaning screen (EQIP No. 447) (b)	\$9,285
Pump with diesel engine, tailwater, horizontal well, about 100 gpm (EQIP 533) (b)	\$21,000
Aluminum Pipe Cost per Foot, 36 inch, 14 gage (EQIP EXMAT, PIPE) (b)	\$49
Feet of pipe for pond water intake	30
Total Pond Intake Cost	\$1,470
Pipe from well to pond, cost per foot of pipe, 12" PVC (EQIP 430-DD) (b)	\$17.70
Feet of pipe from well to pond	1,807
Total Piping Cost	\$31,992
Total Installation Cost	\$386,023
Total Cost per Acre	\$1,287
Total Annual Cost Per Acre Per Year Amortized at 10% over 20 years, 2007 dollars	\$151.14
Total Annual Cost Per Acre Per Year Amortized at 10% over 20 years, 2010 \$	\$158.58
Annual Operations and Maintenance Cost, 2010 dollars	
Management Cost per acre of pond (c)	\$132.72
Total Annual O&M Cost	\$796.32
Total Annual O&M Cost per Farm Acre Per Year, 2008 dollars	\$2.65
Total Annualized Installation and O&M Cost per Farm Acre per Year	\$161.23

(a) Size of the tailwater recovery pond is based on site specific parameters such as pond depth, the runoff volume and rate, and the required level of water control where the tailwater is returned to the irrigation system. For this cost estimation, 2 acres of pond with an average depth of 10 feet per 100 acres of irrigated land is assumed. Also, the pond is located at the edge of the property and the water supply well is located at the center of the property.

(b) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007. For Filter, self-cleaning screen, cost is from State of Florida, Area III Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Area III represents counties west and south of Hendry County.

(c) Management includes cleaning and re-grading collection facilities, inspection and removal of debris and sediment, inspection of pipeline and pump components, and routine maintenance of mechanical components in accordance with manufacturer recommendations. Annual per acre cost estimated as \$11.06 per acre labor cost times 12 hours per acre per year of pond.

The itemized estimated costs to convert a vegetable farm from a seepage irrigation system to a low volume irrigation system such as drip and micro-irrigation are provided in Table 4.12. Common vegetable crops produced in the C-139 Basin are tomatoes, peppers and green beans.

Table 4.12
Estimated Cost to Convert Vegetable Farm from Seepage Irrigation System
To Low Volume Irrigation (Drip, Micro-Jet, Micro-Sprinkler)

Item	Value Per Acre
Materials and Installation Cost (a)	
Drip System (EQIP No. 441, complete system replacement)	\$1,448
Semi-Enclosed Seepage System (EQIP No. 443)	\$525
Difference in Cost	\$923
Annualized Difference in Cost over 15 years at 10% annual interest	\$121
Annual Operations and Maintenance Cost (b)	
Increased cost of energy	\$121
Reduced cost of fertilizer, chemicals, labor and tillage operations	-\$88
Total Increase in Annual Operations and Maintenance	\$33
Total Annual Net Cost	\$155

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) From Irrigation Association Drip-Micro Common Interest Group Market Development Subcommittee, Drip-Micro Irrigation Payback Wizard, www.dripmicrowizard.com. Data based on U.S. and Florida government data sources and multiple assumptions associated with Florida-grown vegetables, pepper and eggplant with a current gravity irrigation system. Farm size is 300 acres.

The itemized estimated costs to convert a sugarcane farm from a seepage irrigation system to a low volume irrigation system such as drip and micro-irrigation are provided in Table 4.13. The likelihood of a sugarcane permittee or applicant choosing this BMP is low because of the crop characteristics and the relatively high cost of conversion to a drip system. The annualized cost per acre for vegetable crops and sugarcane ranges from \$122 to \$155. The latter value was used in Table 4.10.

Table 4.13
Estimated Cost to Convert Sugarcane Farm from Seepage Irrigation System to Low Volume Irrigation (Drip, Micro-Jet, Micro-Sprinkler)

Item	Value Per Acre
Materials and Installation Cost (a)	
Drip System (EQIP No. 441, complete system replacement)	\$1,448
Semi-Enclosed Seepage System (EQIP No. 443)	\$525
Difference in Cost	\$923
Annualized Difference in Cost over 15 years at 10% annual interest	\$121
Annual Operations and Maintenance Cost (b)	
Increased cost of energy	\$49
Reduced cost of fertilizer, chemicals, labor and tillage operations	-\$48
Total Increase in Annual Operations and Maintenance	\$1
Total Annual Net Cost	\$122

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) From Irrigation Association Drip-Micro Common Interest Group Market Development Subcommittee, Drip-Micro Irrigation Payback Wizard, www.dripmicrowizard.com. Data based on U.S. and Florida government data sources and multiple assumptions associated with Florida-grown sugarcane with a current gravity irrigation system. Farm size is 300 acres.

The itemized estimated cost to install and operate a Precision Irrigation Scheduling System is provided in Table 4.14. This system includes an On-Farm Decision Support System, Water Flow Meters and a Soil Moisture Monitoring System. Each component is discussed below in turn.

An on-farm decision support system controller provides the grower with a way to automate irrigation events. The automation input can be as simple as a manually set timer (just like the typical homeowner's lawn irrigation controller) or a sophisticated ET monitor or soil moisture sensor. On-farm decision support systems use a combination of hardware and software to control the operation of actuators, such as motors, and solenoids⁵ associated with irrigation zones, pumps and fuel powered machinery and equipment. The cost estimate for the on-farm decision support system includes the items needed to

⁵ Solenoids are used as switches and relays. A solenoid is a device consisting of a cylindrical coil of wire surrounding a movable iron core that moves along the length of the coil when an electric current is passed through it.

set up the strategy for controlling the irrigations and the mechanism to control the irrigations based on the strategy and the data being recorded by the sensor.

Water flow meters are used to keep track of the amount of water being used for irrigation and the effectiveness of irrigation strategies in minimizing the amount of irrigation water applied while maximizing crop yield and quality.

Sensors that monitor soil moisture at the root zone and provide this information to the on-farm decision support system controller help reduce irrigation water use because water is applied only when needed by the plant. According to Michael Dukes, Associate Professor, Department of Agricultural and Biological Engineering, University of Florida⁶, “An on-demand SMS controller initiates irrigation at a pre-programmed low soil moisture threshold and terminates irrigation at a high threshold. This type of controller is often used where a high level of customization or high level of control is needed such as commercial sites or other types of sites with many irrigation zones. Thus, this controller initiates and terminates irrigation events.” The cost of soil moisture sensors is included in the estimated cost of the Precision Irrigation Scheduling System. Other “smart” monitors such as ET controllers can also increase irrigation water use efficiency.

Table 4.14
Estimated Cost of Precision Irrigation System, Includes On-Farm Decision Support System Controller, Water Flow Meters and Soil Moisture Monitoring System

Item	Value
Farm Size in acres	300
1. On-Farm Decision Support System Controller	
Irrigation System Controller (a)	\$3,970
Controller Installation (b)	\$820
Valve cost (c)	\$11,068
Installation of Valves and hydraulic tubing (c)	\$4,612
Total Cost	\$20,469
Annualized Cost over 10 years at 10% annual interest	\$3,331
Annualized Cost per Acre	\$11.10
2. Water Flow Meters	
Cost of One Water Flow Meter, includes installation (d)	\$1,537
Number of Pump Stations	13.00
Total Cost, includes installation	\$19,984

⁶ Michael Dukes, “Smart Irrigation Controllers: What Makes an Irrigation Controller Smart?”, AE 442, Agricultural and Biological Engineering Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, February 2009.

Table 4.14
Estimated Cost of Precision Irrigation System, Includes On-Farm Decision Support System
Controller, Water Flow Meters and Soil Moisture Monitoring System

Annualized Cost over 15 years at 10% annual interest	\$2,627
Annualized Cost per Acre	\$8.76
3. Soil Moisture Monitoring System	
Cost of Soil Moisture Sensor - 1-12 inch and 1-24 inch per 10 Acres, includes taxes, shipping and installation (e)	\$232
Radio (f)	\$2,156
Sub-total Cost	\$2,389
Number of Units	30
Total Cost of Soil Moisture Sensors and Radios	\$71,656
Test Pump Service Unit and Coring Tool (e) (g)	\$293
Radio Receiver (h)	\$1,414
Total Cost	\$73,364
Annualized Cost over 10 years at 10% annual interest	\$11,940
Annualized Cost per Acre	\$40
Total Annualized Cost per Acre - All 3 Components	\$60

(a) Cost quote in November 18, 2008 from Contemporary Controls & Communications, Inc. of La-belle, Florida, (CCC) Estimate # 6534, on November 18, 2008. Cost increased from 2008 dollars to 2010 dollars using a factor of 1.024804 based on GDP Chained Price Index from U.S. OMB.

(b) From CCC, November 2008. Cost increased from 2008 dollars to 2010 dollars using a factor of 1.024804 based on GDP Chained Price Index from U.S. OMB.

(c) From Gary Bethune, P.E., Agricultural and Civil Engineer, Palmetto, Florida in November 2008. For 300 acre farm, six 8-inch valves are used where cost is \$1,800 per valve and installation cost with tubing is \$750 per valve. Cost increased from 2008 dollars to 2010 dollars using a factor of 1.024804 based on GDP Chained Price Index from U.S. OMB.

(d) From Gary Bethune, P.E. Agricultural and Civil Engineer, Palmetto, Florida in November 2008. For 300 acre farm, 13 pump stations are used where cost is \$1,500 per flow meter, including installation cost. Cost increased from 2008 dollars to 2010 dollars using a factor of 1.024804 based on GDP Chained Price Index from U.S. OMB.

(e) Irrrometer, Inc. is manufacturer. Cost from Forestry-Suppliers .com. Cost in 2008 updated to 2010 dollars.

(f) AquaSpy Radio Node (1,000mW) w/ Solar Panel & Viewer Software/ From B.B. Hobbs, Inc. Cost updated from 2008 dollars to 2010 dollars.

(g) Includes Service Unit. Hand vacuum pump has test gauge for checking exact calibration of irrometer gauge when air evacuated.

(h) AquaSpy Radio Receiver 1000mW, w/ "Rubber Ducky" Antenna, 6 ft., USB cable. Costs updated from 2008 dollars to 2010 dollars.

Particulate Matter and Sediment Controls BMPs. The list of particulate matter and sediment controls BMPs included in Appendix B1 of the proposed rule is provided in Table 4.15.

Table 4.15
Particulate Matter and Sediment Controls Listed in Appendix B1 of Proposed Rule

Best Management Practice
Any 2 = 2.5 points; Any 4 = 5 points; Any 6 = 10 points; Any 8 = 15 points
Maintain sustainable forage growth on pasture to reduce soil erosion/range seedings
Maintain vegetative cover in upland areas to reduce soil erosion
Reduce soil erosion with vegetation on ditch banks
Reduce sediment transport through the use of grassed waterways
Reduce sediment transport through the use of filter strips or riparian conservation buffers adjacent to waterways. No phosphorus is applied to these areas.
Reduce soil erosion with cover crops (not fertilized)
Reduce soil erosion using grassed swales and field ditch connections to laterals
Erosion control by leveling fields
Reduce sediments transported offsite by maintaining a sediment sump/trap upstream of drainage structure.
Minimize sediment buildup through a canal cleaning program.
Minimize phosphorus from plants by aquatic weed control (phosphorus source) at main discharge locations
Minimize sediment transport with slow velocity in main canal near discharge structure
Minimize sediment transport with slow field ditch drainage near pumps/structure
Minimize sediment transport into canals by constructing ditch bank berms
Reduce sediments transported offsite by using field ditch drainage sumps
Reduce sediments transported offsite by raising culvert bottoms above all ditch bottoms to minimize sediment transport
Reduce sediments transported offsite by stabilizing soil through infrastructure improvements at canal/ditch intersections (e.g. flexible plastic pipe, polymer treatment)
Reduce soil erosion with constructed ditch bank stabilization
Reduce debris and aquatic plants (phosphorus source) leaving the site by using barriers at discharge locations

The estimated costs to implement these BMPs are provided in Table 4.16. The itemized estimated costs for seven of these BMPs are provided in Tables 4.17 through 4.23.

Table 4.16
Particulate Matter and Sediment Controls - Estimated Costs of BMPs
To Minimize Phosphorus Loads to C-139 Works of the District, 2010 dollars

Best Management Practice (BMP)	Annual Cost per Farm Acre	Annual Cost – 300 Acre Permit	Annual Cost – 2,500 Acre Permit
Grass Management to maintain sustainable forage growth to reduce soil erosion (variety, mowing, chopping, burning, irrigation) (a)	\$1.76	\$528	\$4,400
Buffer Strips (a)	\$14.08	\$4,224	\$35,200
Off Season Cover Crop (a)	\$17.60	\$5,280	\$44,000
Grass Management Between Trees - Citrus only (a)	\$7.04	\$2,112	\$17,600
Grassed Waterways - Citrus only (a)	\$35.20	\$10,560	\$88,000
Erosion Control (sediment trap in front of risers) - Row Crops and Ornamentals (a)	\$3.52	\$1,056	\$8,800
Erosion Control (Buffer Strips and Sediment Traps) - Sod / Turf Grass (a)	\$17.60	\$5,280	\$44,000
Canal cleaning & aquatic weed control program (b)	\$2.77	\$830	\$6,913
Laser Leveling - Increased Frequency (c)	\$0 to \$20.85	\$0 to \$6,254	\$0 to \$52,119
Install Flashboard Risers to Slow Water Velocity in Main Canal and Field Ditches Near Discharge Structures (d)	\$5.08	\$1,524	\$12,702
Install Trash Racks in Front of Flashboard Risers to Reduce Debris and Aquatic Plants Leaving Site (e)	\$1.11	\$332	\$2,770
Create Field Ditch Drainage Sumps to Reduce Sediments Transported to Canals or Offsite (f)	\$0.44	\$132	\$1,100
Raise Culvert Bottoms Above all Ditch Bottoms to Reduce Sediments Transported to Canals or Offsite (g)	\$0.20	\$59	\$495
Reduce Sediment Transport Offsite by Stabilizing Soil at Canal/Ditch Intersections (h)	\$3.94	\$1,183	\$9,861
Cover and Stabilize Ditch Bank Berms to Minimize Sediment Transport into Canals (i)	\$646	\$193,927	\$1,616,055

(a) From South Florida WMD, St. Lucie River Watershed Protection Plan, Appendix B prepared by Soil and Water Engineering Technology, Inc., January 2009, pages B-5 through B-13.

(b) Cost estimated using 0.25 hour of farm labor per farm acre per year times \$11.06 per hour average U.S. farm wage rate in 2010 from USDA, NASS web site.

(c) Increased frequency from once every 10 years to 3 times every 10 years. See Table 4.17. Currently in the C-139 Basin fields are leveled before planting and the frequency depends on crop type. For vegetables, the land is leveled each year. For sugarcane, the land is leveled every three to four years as new sugarcane is planted. Thus, including this BMP in the BMP Plan is not likely to incur costs to the permittee or applicant.

(d) See Table 4.18.

(e) See Table 4.19.

(f) See Table 4.20.

(g) See Table 4.21.

(h) See Table 4.22.

(i) See Table 4.23.

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Table 4.17
Estimated Cost of Laser Leveling
Increased Frequency from Once Every 10 Years
To Three Times Every 10 Years

Item	Value
Farm Size in acres	300
Custom Laser Leveling, Cost per Hour, From Williams Laser Leveling	\$128
Hours of Laser Leveling per Acre, includes mobilization	0.5
Total Hours	150
Total Cost to Laser Level, One Year	\$19,215
Total Cost in years 3 and 6 of a 10 year cycle (2 times Total cost for one year)	\$38,430
Annualized Cost Per Acre over 10 years at 10% annual interest	\$20.85

Source: Williams Laser Leveling, Okeechobee, Florida, 2008 and updated to 2010 dollars using factor of 1.0248 from GDP Chained Price Index from U.S. OMB.

Table 4.18
Estimated Cost to Install Flashboard Risers to Slow Water Velocity in Main Canal and Field Ditches
Near Discharge Structures, 300 Acre Farm

Item	Units	Number of Units	Cost per Unit	Total Cost
Flashboard Riser (Corrugated aluminum and steel with Stub) (EQIP PIPE) (a) (b)				
Main Canal	Riser - 36" diameter	1	\$1,626	\$1,626
Field Ditches Near Pump	Riser - 18" diameter	10	\$997	\$9,967
Total Cost				\$11,594
Total Cost Amortized Over 15 Years at 10% annual interest				\$1,524
Annualized Cost per Farm Acre				\$5.08

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) Includes costs of all materials, equipment use and labor required to install.

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Table 4.19
Estimated Cost to Install Trash Racks in Front of Flashboard Risers to Reduce Debris and Aquatic Plants Leaving Site, 300 Acre Farm

Item	Units	Number of Units	Cost per Unit	Total Cost
Trash Rack (EQIP PIPE) (a) (b)				
Main Canal	36" diameter	1	\$367	\$367
Field Ditches Near Pump	18" diameter	10	\$216	\$2,161
Total Cost				\$2,529
Total Cost Amortized Over 15 Years at 10% annual interest				\$332
Annualized Cost per Farm Acre				\$1.11

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) Includes costs of all materials, equipment use and labor required to install.

Table 4.20
Estimated Cost to Create Field Ditch Drainage Sumps to Reduce Sediments Transported to Canals or Offsite, 300 Acre Farm

Item	Units	Number of Units	Cost per Unit	Total Cost
Excavation (EQIP EXMAT) (a) (b)	cubic yards (d)	100	\$3.67	\$367
Spoil Spreading (c)	cubic yards (d)	100	\$1.33	\$133
Total Cost				\$500
Total Cost Amortized Over 5 Years at 10% annual interest				\$132
Annualized Cost per Farm Acre				\$0.44

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202. See also R.S. Means costs of \$4 to \$5 per cubic yard, including labor and machinery.

(b) Includes costs of all materials, equipment use and labor required for excavation.

(c) Cost per cubic yard from R.S. Means 2010 cost data for Lakeland, Florida. Cost of spreading in eight inch layer with small dozer, loosely packed. See also EQIP Item 572 of \$0.84 which includes costs of all materials, equipment use and labor required for spreading of surplus or dumped spoil material.

(d) Assumes 10 sumps created and 10 cubic yards of soil per sump are excavated and spread on-farm.

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Table 4.21
Estimated Cost to Raise Culvert Bottoms Above all Ditch Bottoms to Reduce Sediments
Transported to Canals or Offsite, 300 Acre Farm

Item	Units	Number of Units	Cost per Unit	Total Cost
Excavation (EQIP EXMAT) (a) (b)	cubic yards (d)	50	\$3.67	\$184
Shaping (Medium) (EQIP EXMAT) (a) (c)	cubic yards (d)	50	\$0.83	\$42
Total Cost				\$225
Total Cost Amortized Over 5 Years at 10% annual interest				\$59
Annualized Cost per Farm Acre				\$0.20

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) Includes costs of all materials, equipment use and labor required for excavation.

(c) Includes shaping irregularities and gullies 1 to 4 feet deep, requires non-farm equipment.

(d) Assumes 10 culverts raised and 5 cubic yards of soil per culvert are excavated and placed around raised culvert.

Table 4.22
Estimated Cost to Reduce Sediment Transport Offsite by Stabilizing Soil at Canal/Ditch Inter-
sections, 300 Acre Farm

Item	Units	Cost per Unit	No. of Units	Total Cost
Outlet Pipe or Armoring Agent Installed at Discharge points of field/farm ditches to larger canals to prevent sediment scouring (a)	Outlet	\$150	60	\$9,000
Total Cost amortized over 15 years at 10% interest				\$1,183
Annualized Cost per Farm Acre				\$3.94

(a) Cost per Outlet and five acres per outlet from Del Bottcher, Soil and Water Engineering Technology, Inc., April 23, 2010.

Table 4.23
Cost to Construct, Cover and Stabilize Ditch Bank Berms to Minimize Sediment Transport
Into Canals for 300 Acre Farm

Item	Units	Number of Units	Cost per Unit	Total Cost
Cost to Create Ditch Berms with Cover (EQIP Code 580) (a)				
Shaping and Vegetation (b)	Linear Feet (d)	58,080	\$31	\$1,828,130
Total Cost Amortized Over 30 Years at 10% annual interest - Shaping and Vegetation				\$193,927
Annualized Cost per Farm Acre				\$646
Structural and Vegetation (c)	Linear Feet (d)	58,080	\$65	\$3,775,200
Total Cost Amortized Over 30 Years at 10% annual interest - Shaping and Vegetation				\$400,470
Annualized Cost per Farm Acre				\$1,335

(a) Source of costs is State of Florida, Area IV Cost Share List for Selected Conservation Practices for EQIP, FY 2007, United States Department of Agriculture, Natural Resource Conservation Service, Environmental Quality Incentive Program (EQIP). Area IV represents Hendry County. Cost converted from 2007 dollars to 2010 dollars using GDP Chained Price Index factor of 1.049202.

(b) From EQIP 580, Streambank and Shoreline Protection, Vegetative Measures with shaping only. Includes cost of all materials, equipment use and labor required to install shaping, earthfill, compaction, seedbed preparation, cultipacking, planting, perennial seed or sprigs, nurse crop, hay mulch, fertilizer and lime for establishment. Cost includes one side of ditch/canal.

(c) From EQIP 580, Streambank and Shoreline Protection, Structural and Vegetative Measures. Includes cost of all materials, equipment use and labor required to install excavation, earthfill, compaction, non-woven geotextile fabric, rock rip rap, seedbed preparation, cultipacking, planting, perennial grass, nurse crop, hay mulch, fertilizer and lime for establishment. Cost includes one side of ditch/canal.

(d) Assumes twelve 25 acre fields and each field is surrounded by one mile of ditch or canal. So, assuming that each side of the field is 1/4 mile, the total linear feet of berm needed is $[(14 \times 0.25 \times 2 \text{ sides}) + (16 \times 0.25 \times 1 \text{ side})] \times 5,280 = 58,080$ linear feet.

Pasture Management BMPs. The list of pasture management BMPs included in Appendix B1 of the proposed rule is provided in Table 4.24.

Table 4.24
List of Pasture Management BMPs Listed in Appendix B1 of Proposed Rule

Best Management Practice
Includes restricted placement of stored feed, feeders, mineral, and molasses stations to reduce concentrated areas near drainage ditches, when applicable – 2.5 points
Provide restricted placement of cowpens to reduce concentrated areas near drainage ditches - 2.5 points
Provide shade structures to prevent cattle in waterways – 2.5 points
Alternative cattle water sources: restricted placement of water to reduce concentrated areas near drainage ditches – 2.5 points
Restrict cattle from waterways through fencing of canals in a manner that protects water quality – 10 points
Low cattle density (1 head/2 acres, nonirrigated pasture) by providing comprehensive prescribed grazing – 5 points

The estimated costs to implement these BMPs are provided in Table 4.25. The itemized estimated costs for the reduced cattle stocking rate BMP is provided in Table 4.26. The BMP cattle stocking rate of 1 head per 2 acres is the approximate baseline stocking rate of the C-139 Basin so there is not expected to be a significant net revenue reduction associated with this BMP. .

Table 4.25
Pasture Management - Estimated Costs of BMPs
To Minimize Phosphorus Loads to C-139 Works of the District, 2010 dollars

Best Management Practice (BMP)	Annual Cost per Farm Acre	Annual Cost – 300 Acre Permit	Annual Cost – 2,500 Acre Permit
Placement of Feeder / Minerals and Water (a)	\$0.70	\$211	\$1,760
Provide Alternative Shade to move cattle from streams (a)	5.28	\$1,584	\$13,200
Improved Watering Facilities to move cattle from streams (a)	\$3.52	\$1,056	\$8,800
Critical Area Fencing (a)	\$14.08	\$4,224	\$35,200
Reduced Stocking Rate from 1.33 head per 2 acres to 1 head per 2 acres (b)	\$66.28	\$19,884	\$165,698

(a) From South Florida WMD, St. Lucie River Watershed Protection Plan, Appendix B prepared by Soil and Water Engineering Technology, Inc., January 2009, pages B-5 through B-13.

(b) See Table 4.26.

Table 4.26
Change in Net Revenue from Reduced Stocking Rate
Or No Nutrients Imported Indirectly Through Cattle Feed (a)

Item	Baseline	Cattle Stocking Rate BMP
	(1.33 head per 2 acres)	(1 head per 2 acres)
Cow Density (cows / acre)	0.67	0.50
Sale Price per Pound (weighted average calf and cull) (a)	\$1.16	\$1.16
Pounds Sold Annually Per Acre (b)	260.60	195.94
Marginal Cost per Cow Per Year (c)	\$54.36	\$54.36
Total Revenue per Acre	\$303.28	\$228.03
Total Marginal Cost per Acre	\$36.15	\$27.18
Net Revenue Per Acre Per Year	\$267.14	\$200.86
Difference in Net Revenue Per Acre		-\$66.28

(a) From Florida Agricultural Statistics Service, "Livestock, Dairy, Poultry Summary, 2008", page 30, nass-fl@nass.usda.gov

(b) From South Florida Water Management District, LOADSS Update and Verification Project Report, prepared by Soil and Water Engineering Technology, Inc., January 1999, Task 5 - page 11.

(c) Marginal cost is cost of minerals and molasses per cow per year from LOADSS. Amount of minerals and molasses per cow per year from Table 3A, Task 5- page 13, LOADSS Update and Verification Project Report, Contract C-7611, Final Report for the South Florida Water Management District, submitted by Soil and Water Engineering Technology, Inc., January 1999. See also USDA, 2008 Costs per Bred Cow - Supplemental Feed cost is \$31 to \$54 per bred cow, depending on area of the United States.

4.8 Verification Plan and Permit Basin Discharge Monitoring Program

Water discharged from the C-139 Basin is monitored by the District for phosphorous load quality and quantity. In addition, the permittee may implement a Permit Basin Discharge Monitoring Program upstream of District monitoring sites on Permit Basins. In some cases the permittee may be required to implement such a program pursuant to the following proposed sections of Part IV of Chapter 40E-63, F.A.C.

- a) 40E-63.437: Permittees may be required to implement a Permit Basin Discharge Monitoring Plan on a case-by-case basis as determined by the conditions indicated below:

40E-63.437(1): Permit applicants that propose BMPs other than those included in Appendix B1 of the rule may be required to demonstrate the effectiveness of these BMPs through a discharge monitoring program.

40E-63.437(2): Permit applicants that propose a BMP Plan with fewer BMP points per BMP category than required and where there is no existing water quality monitoring data to justify the alternate approach (e.g., District sub-basin or grab monitoring programs).

40E-63.437(3): Permit applicants that propose demonstration projects for BMP points and the applicant proposes water quality monitoring to request BMP points in addition to those established in Appendix B1.

- b) 40E-63.438: Early Implementation of water quality improvement activities. If a voluntary demonstration project is proposed, a verification plan (40E-63.461(4)) through a discharge monitoring program shall be implemented to confirm and quantify the estimated phosphorus reductions.
- c) 40E-63.444(1)(r): For sites with application of wastewater residuals (biosolids), animal manure, solid waste, fill material, or other materials containing phosphorus a Permit Basin Discharge Monitoring Program is required to demonstrate no potential impacts on phosphorus loading.
- d) 40E-63.461(4): If the C-139 Basin is determined to be out of compliance, permittees shall propose water quality improvement activities (WQIA). The WQIA shall include the estimated total phosphorus reductions to be achieved (these total phosphorus reductions shall be the minimum levels necessary to meet the Permit Basin's proportional share of required total phosphorus reductions as determined by the District). If the permittee is unable to demonstrate that the required total phosphorus reductions can be achieved, a verification plan (or Permit Basin Discharge Monitoring Program) shall be required.
- e) 40E-63.461(6): If a permittee submits a request for determination of impracticability, the permittee must propose a discharge monitoring plan in accordance with rule 40E-63.462, F.A.C. to verify that the proposed performance level is met.

A summary of the scale, time frame, data analysis and parameter data collected for each incidence in which a Permit Basin Discharge Monitoring Program is required is provided in Table 4.27.

Table 4.27
Summary of Proposed Water Monitoring Requirements under 40E-63, Part IV, "Everglades Regulatory Program: Pollutant Source Controls, C-139 Basin"

Reason for Monitoring	Scale	Time Frame	Data Analysis	Parameter Data Collected
Voluntary Permit Basin Discharge Monitoring Program	Permit basin level	Continuous to estimate the proportional share of the load, or as selected by permittee	Performance measure evaluation by the District	Total phosphorus concentration and flow
Water Quality Improvement Activity (WQIA) Verification Plan	Permit basin level or smaller (e.g. land use, crop or acreage)	Up to three years	BMP Plan Performance Effectiveness evaluation by the Permittee	Total phosphorus concentration and flow, except if permittee or applicant proposes specific reduction related to water phosphorus speciation, soil P, tissue P, site-specific rainfall, etc.
As Required by 40E-63.437, F.A.C., Alternative BMP Points Per Category	Permit basin level or smaller (e.g. land use, crop or acreage)	At renewal and based on permit modification applications. Up to 3 years for demonstration projects.		
Optional Early Implementation of Water Quality Improvement Activities under 40E-63.438, F.A.C.	Permit basin level or smaller (e.g. land use, crop or acreage)	At renewal and based on permit modification applications		
Application of residuals as required by 40E-63.444(1)(r), F.A.C.	Permit basin level		Evaluation by the District	Total phosphorus concentration and flow. May include soil testing.
Determination of Impracticability under 40E-63.461(6), F.A.C.	Permit Basin level or smaller (e.g. land use, crop or acreage)	Continuous and can be renewed on five-year cycles	BMP Plan Performance Effectiveness evaluation by the District and at the permit renewal cycle	Total phosphorus concentration and flow

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The estimated itemized cost to prepare a verification plan or a Permit Basin Discharge Monitoring Program and the estimated cost to implement this plan are provided in Table 4.28. The estimated cost does not include the cost associated with evaluating the phosphorus performance of a BMP plan that the permittee may be required to provide under certain conditions as summarized in Table 4.27. This cost will depend on the specific BMP being tested and the hourly labor cost of the person conducting the evaluation.

Assuming that each discharge monitoring point is associated with 2,500 acres⁷, the estimated cost is \$5.26 per acre per year. This cost includes plan development and discharge water quality sampling and quantity monitoring and reporting consistent with Appendix B of the District's Guidebook for Preparing an Application for a C-139 Basin Pollutant Source Control Permit.

Table 4.28
Estimated Annual Cost of Water Quality Sampling and Quantity Monitoring
Under a Permit Basin Discharge Monitoring Program

Item	Unit	Cost per Unit	Number of Units	Total Cost
Capital Cost				
Prepare Verification Plan or Permit Basin Discharge Monitoring Program	Labor Hours	\$130	16	\$2,080
Automatic Sampler	1 Sampler	\$3,000	1	\$3,000
Rainfall Gauge	1 Gauge	\$150	1	\$150
Water Flow Meter	1 Meter	\$1,500	1	\$1,500
Equipment Housing	Lump sum	\$1,500	1	\$1,500
Field Installation	Labor Hours	\$47.18	16	\$755
Calibration by Professional Engineer (P.E.)	Labor Hours	\$130	16	\$2,080
Total Capital Cost				\$11,065
Annualized One Time Cost over 5 Years at 10% annual interest rate				\$2,919
Annual O&M Cost				
Laboratory Cost	Per Sample	\$20	87	\$1,740
Data Collection and Reporting	Labor Hours	\$47.18	180	\$8,492
Total Annual O&M Cost				\$10,232
Total Annualized Cost				\$13,150
Number of Acres per Monitoring Site				2,500
Annualized Cost Per Permit Acre				\$5.26

Source: Estimates based on Appendix B of District's Guidebook for Preparing an Application for a C-139 Basin Pollutant Source Control Permit and cost per unit estimates from Hazen and Sawyer in-house sources. Water flow meter assumes that water is discharged to canals via a weir and an ultrasonic level transmitter is used. Water samples are collected during each discharge event and delivered to lab. The amount of water discharged is recorded during each discharge event. Rainfall is recorded by hand each day. Water flow calculations are calibrated by a professional engineer (P.E.) after water meter installation and every five years. The number of days when a discharge event occurs is 24% of 365 days based on 1 day per week (14%) of significant rainfall during the 6 winter months and 1 day per 3 days (33%) of significant rainfall during the 6 summer months.

⁷ which is the median acreage of the existing C-139 General Permits

4.9 Alternatives That May Reduce Transactions Cost

The proposed rule provides alternatives for permittees to reduce transaction costs. Under the proposed rule, permittees may elect to implement an alternative BMP Plan instead of following the standard criteria; they can apply for early implementation of water quality improvement activities, they can conduct permit basin water quality monitoring or they can apply for a determination that additional water quality improvement activities are impracticable.

4.9.1 Early BMPs and Demonstration Plan

According to the Guidebook for Preparing an Application for a C-139 Basin Pollutant Source Control Permit, if the C-139 Basin is determined out-of-compliance in the future, remedial actions or water quality improvement activities are not required if applicants opt to voluntarily implement additional BMPs (early BMPs) or a BMP demonstration project that includes a BMP performance verification plan. Either proposal shall be submitted with an application for a new permit, permit renewal, or as a Letter Modification. The following applicable items need to be included in the application:

Early BMPs

- Description of the BMP or group of BMPs that will be implemented in addition to those required by Rule at the time of the application (Section 40E-63.435 or 40E-63.461(3), F.A.C.)
- The specific methods for implementation and maintenance
- Technical documentation supporting the proposed loading reduction levels. The proposed loading reduction levels shall be in accordance with 40E-63.438(1)(a)2, F.A.C.
- The implementation schedule

Demonstration Plan with the Verification Plan

- Proposed Scope of Work (SOW) (as required in Section 40E-63.437(3)(a), F.A.C.)
- Projected phosphorus removal efficiencies (include technical supporting documentation)
- Verification plan (shall meet the criteria described in 40E-63.461(4), F.A.C.). The proposal shall include (but is not limited to):

- Complete Part V of Form 1045 – C-139 Basin Optional Discharge Monitoring Plan;
- Installation and implementation schedule;
- Description of the monitoring program;
- Description of the monitoring sites;
- Description of proposed sample collection methods and schedule;
- Description of proposed sample handling and laboratory analyses;
- Description of data review procedures;
- Description of backup plan if there is equipment malfunction”

4.9.2 Determination of Impracticability

Under the proposed rule, permittees may elect to demonstrate that water quality improvement activities are impracticable. This option is not provided under current rule. Impracticability is described in subsection 40E-63.461(6), F.A.C.

Any such request for determination of impracticability must be submitted to the District under a permit modification application. The permit modification fee is \$100. For the District to consider the application for approval, the submittal shall include the following.

(a) Specify all of the BMPs and activities that were implemented previously and provide evidence to show that no additional BMPs and activities or refinements for the reduction of phosphorus can be reasonably accomplished at the site or sites of operation.

(b) Propose the expected amount of phosphorus discharge in comparison to the C-139 Basin's phosphorus load targets and limits, calculated in accordance with Appendices B3.1 and B3.2, incorporated by reference in subsection 40E-63.446(2), F.A.C., for the range of historic rainfall conditions in accordance with Appendix B2, incorporated by reference in subsection 40E-63.446(1), F.A.C. No increasing trend in phosphorus from the property, as determined by the District, will be allowed under any scenario. The District will review the proposed performance level in reference to available representative historic data.

(c) Propose a discharge monitoring plan in accordance with rule 40E-63.462, F.A.C. to verify that the proposed performance level is met. In the event that the farm configura-

tion is not conducive to a discharge monitoring program, the District may consider requests for the use of alternate representative locations or monitoring for concentration only. Upon District approval of the monitoring plan, special limiting conditions (such as applicable conditions from rule 40E-63.464, F.A.C.) will be incorporated to the permit.

(d) Such requests shall apply only to the Permit Basin or portion thereof (e.g., land use, crop or acreage) which demonstrated further activities are impracticable.

(e) The District shall send a copy of each such request to the Department of Environmental Protection.

(f) Determinations of impracticability will be valid until the next permit renewal cycle.

The cost to the permittee to complete "Part VIII. Impracticability" of the permit form will vary by permittee depending on the scope of the BMPs and land uses for which impracticability is being sought. The permittee would need to provide evidence to show that no additional BMPs and activities or refinements for the reduction of phosphorus can be reasonably accomplished at the site or sites of operation. In addition, the permittee would need to propose a discharge monitoring program in accordance with rule 40E-63.462, F.A.C. to verify that the proposed performance level is met. The estimated cost associated with developing and implementing a discharge monitoring program was provided in Section 4.8 of this Section.

Section 5.0

Impacts to Small Businesses, Small Cities and Small Counties

In accordance with Section 120.54(3)(b)2.a, Fla. Stat., the District is required to consider the impact of its rules on small businesses, small cities, and small counties. Small business is defined in Section 288.703(1), Fla. Stat., as “an independently owned and operated business concern employing 200 or fewer permanent full-time employees and that, together with its affiliates, has a net worth of not more than \$5 million or any firm based in this state which has a Small Business Administration (SBA) 8(a) certification”. Small cities is defined in Section 120.52(18), Fla. Stat., as “any municipality that has an unincorporated population of 10,000 or less according to the most recent decennial census”. A small county is defined in Section 120.52(19), Fla. Stat., as “any county that has an unincorporated population of 75,000 or less according to the most recent decennial census”.

The proposed rule is not expected to incur costs to small businesses, small cities and small counties unless the business, city or county owns, leases or operates on properties where water management systems connect to and make use of the canals, structures, and other Works of the District within the C-139 Basin. The C-139 Basin is located in northeast Hendry County, just southwest of Clewiston, Florida and Lake Okeechobee.

There are no small cities which are required to comply with the proposed rule. Hendry County’s population in 2000 was 36,210 according to the U.S. Census. The 2007 population estimate for Hendry County is 39,651.¹ While Hendry County is a small county, it does not own or operate property that would require a General Permit. A search of the Hendry County Property Appraiser database available at www.hendryprop.com, did not locate any property in the C-139 Basin owned by Hendry County.

It is not known how many of the General and No Notice General permittees are small businesses because publicly available information regarding businesses in this small geographic area could not be located. The estimated transactional costs associated with the proposed rule are provided in Section 4.0 of this SERC.

¹The Hendry County 2000 and 2007 populations are from Florida Statistical Abstract, 2008, published by the University of Florida, Bureau of Economic and Business Research, Warrington College of Business Administration, Gainesville, Florida, pages 8 and 13.

In the event that a small business, small city or small county must comply with the proposed rule, the potential transactional costs are provided in Section 4.0 of this document.

APPENDIX A

Section IV, Code 590 of the
United States Department of Agriculture
Natural Resources Conservation Service
Conservation Practice Standard, NE-T.G. Notice 600
January 2009

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

NUTRIENT MANAGEMENT

(Ac.)

CODE 590

DEFINITION

Managing the amount, source, placement, form and timing of the application of plant nutrients and soil amendments.

PURPOSE

- To budget and supply nutrients for plant production.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To minimize agricultural nonpoint source pollution of surface and ground water resources.
- To protect air quality by reducing nitrogen emissions (ammonia and NO_x compounds) and the formation of atmospheric particulates.
- To maintain or improve the physical, chemical and biological condition of soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where plant nutrients and soil amendments are applied.

CRITERIA

General Criteria Applicable to All Purposes

A nutrient budget for nitrogen, phosphorus, and potassium shall be developed that considers all potential sources of nutrients including, but not limited to animal manure and organic by-products, waste water, commercial fertilizer, crop residues, organic matter, legume credits, and irrigation water.

Plans for nutrient management shall specify the source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing nitrogen and/or phosphorus movement to surface and/or ground waters.

For additional guidance on nutrient management planning, refer to Practice Specification for Nutrient Management (S-590).

Realistic yield goals shall be clearly documented and shall be established using the best available records and information from similar fields and management systems in the location of interest.

Appropriate assessment tools shall be used to evaluate the risk for nutrients to be lost to erosion, runoff, and leaching. Erosion, runoff and water management practices will be installed, as needed, on fields that receive nutrients.

Plans for nutrient management shall comply with all applicable Federal, state, and local laws and regulations.

Plans for nutrient management shall be developed in accordance with policy requirements of the NRCS General Manual Title 450, Part 401.03 (Technical Guides, Policy and Responsibilities) and Title 190, Part 402 (Ecological Sciences, Nutrient Management, Policy); technical requirements of the NRCS Field Office Technical Guide (FOTG); procedures contained in the National Planning Procedures Handbook (NPPH), and the NRCS National Agronomy Manual (NAM) Section 504, Amendment NE16.

Persons who review or approve plans for nutrient management shall be certified through any certification program acceptable to NRCS within the state.

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Soil Sampling and Laboratory Analyses (Testing). Nutrient planning shall be based on current soil test results developed in accordance with the University of Nebraska recommendations.

Soil samples shall be collected and prepared according to the University of Nebraska NebGuide G1740 "Guidelines for Soil Sampling".

Soil test analyses shall be performed by laboratories that have successfully met the requirements and performance standards of the Soil Science Society of America. Required soil test analysis shall use procedures that have been calibrated or interpreted by the University of Nebraska. Soil testing shall include analyses for any nutrients for which specific information is needed to develop the nutrient management plan. Request analyses pertinent to monitoring or amending the annual nutrient budget, e.g. pH, electrical conductivity (EC), soil organic matter, nitrogen, phosphorus and potassium.

Supplemental Testing. Additional test results shall be used as a supplement to nutrient planning. Grid or zone soil testing, tissue sampling and testing, chlorophyll meters, and corn stalk nitrate test where used shall be collected and prepared in accordance with University of Nebraska guidance and recommendations. Testing shall include analysis for any nutrients for which specific information is needed to develop the nutrient plan.

Nutrient Application Rates. Recommended nutrient application rates shall be based on the University of Nebraska recommendations (and/or industry practice when recognized by the university) that consider current soil test results, plant tissue results where relevant, realistic yield goals and management capabilities.

The planned rates of nutrient application, as documented in the nutrient budget, shall be determined based on the following guidance:

- Nitrogen Application - Planned nitrogen application rates shall match the University of Nebraska recommended rates as closely as possible, except when manure or organic by-products are a source of nutrients. Refer to Appendix A for a list of NebGuides. When manure or organic by-

products are a source of nutrients, see "Additional Criteria" below.

- Phosphorus Application - Planned phosphorus application rates shall match the recommended rates.
- Potassium Application - Potassium shall not be applied in situations in which it causes unacceptable nutrient imbalances in crops or forages. When forage quality is an issue associated with excess potassium application, state standards shall be used to set forage quality guidelines.

Most Nebraska soils are capable of supplying enough potassium for excellent corn yields. The University of Nebraska recommendations for potassium are based on the sufficiency concept. A chemical test procedure for potassium does not measure total potassium in the soil. The value from the chemical analysis is an index of the soil's ability to supply potassium to different crops. See NebGuides for tables useful in determining potassium fertilizer needs for crops.

- Lime - Lime shall be applied, as needed, to adjust soil pH to an adequate level for crop nutrient availability and utilization.
- Other Plant Nutrients (i.e. sulfur, iron, and zinc) - The planned rates of application of other nutrients shall be consistent with University of Nebraska guidance.
- Starter Fertilizers - When starter fertilizers are used, they shall be included in the overall nutrient budget, and applied in accordance with the University of Nebraska recommendations.

Nutrient Application Timing. Timing and method of nutrient application (particularly nitrogen) shall correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, livestock waste control system limitations, weather and climatic conditions, risk assessment tools (e.g., leaching index, P index), and field accessibility.

Nutrient Application Methods. Application methods to reduce the risk of nutrient transport to surface and ground water, or into the atmosphere shall be employed.

To minimize nutrient losses:

- Apply nutrient materials uniformly to application area(s), except when variable-rate application is employed using site-specific management.
- Nutrients shall be applied considering the plant growth habits, irrigation practices, and other conditions so as to maximize availability to the plant and minimize the risk of runoff, leaching, and volatilization losses.
- Avoid application of anhydrous ammonia on wet soils or other situations where application slots will not seal adequately.

Nutrient applications associated with irrigation systems shall be applied in accordance with the requirements of Irrigation Water Management (Code 449).

Any irrigation distribution system through which chemical fertilizers, manure (liquid wastes) or pretreatment wastes (municipal effluent) are distributed shall be equipped with properly designed and operating valves and components to prevent backflows into the water sources(s) and/or contamination of groundwater, surface water or soil.

All local, state and federal applicable laws and regulations must be followed for fertigation where:

- Persons planning to apply commercial fertilizer through an irrigation system must contact the local Natural Resources District (NRD) to determine what permits are necessary.
- In addition to contacting the local NRD, persons applying liquid wastes or municipal effluent through an irrigation system must contact the Nebraska Department of Environmental Quality to determine if any permits are necessary.

Additional Criteria Applicable to Manure and Organic By-Products as a Plant Nutrient Source

When animal manures or organic by-products are applied, a P-Index risk assessment of the potential for phosphorus transport from the field or MU shall be completed to adjust the amount, placement, form and timing of

application of nutrient sources, as recommended by the University of Nebraska.

Manure and Organic By-Product Nutrient Application Timing. Manure and/or organic by-products shall not be applied to frozen, snow-covered or saturated soil if the potential risk for runoff exists.

Manure and Organic By-Product Nutrient Application Rates. Manure and organic by-product samples shall be collected and prepared according to the University of Nebraska recommendations (NebGuide G1450 "Sampling Manures for Nutrient Analysis").

The application rate (in/hr) of liquid materials applied shall not exceed the soil intake/infiltration rate and shall be adjusted to minimize ponding and to avoid runoff. The total application shall not exceed the available water holding capacity of the soil within the crops root zone and shall be adjusted, as needed, to minimize loss to subsurface tile drains.

The planned rates of nitrogen and phosphorus application recorded in the plan shall be determined based on the following guidance.

Nitrogen Application Rates

- When manure or organic by-products are used, the nitrogen availability of the planned application rates shall match plant uptake characteristics as closely as possible, taking into consideration the timing of nutrient application(s) in order to minimize leaching and atmospheric losses.
- Management activities and technologies shall be used that effectively utilize mineralized nitrogen and that minimize nitrogen losses through denitrification and ammonia volatilization.

Phosphorus Application Rates

- When manure or organic by-products are used, the planned rates of phosphorus application shall be consistent with one of the following:
 - ◇ P-Index Rating. Nitrogen-based manure application on "Low" or "Medium" risk sites; phosphorus-based or no manure application on

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“High” risk sites; and no manure application on “Very High” risk sites. Refer to Nebraska Agronomy Technical Note 107 “Nebraska Phosphorus Index: Background and User Guide” or NebGuide EC195.

- ◇ Soil Test. Nitrogen-based manure application on sites for which the soil test recommendation calls for phosphorus application; phosphorus-based or no manure application on sites for which the soil test recommendation calls for no phosphorus application.

Additional Criteria Applicable to Biosolids Applied as a Plant Nutrient Source

Biosolids (sewage sludge) shall be applied in accordance with USEPA regulations. (40 CFR Parts 403 (Pretreatment) and 503 (Biosolids) and other state and/or local regulations regarding the use of biosolids as a nutrient source.

When sewage sludge (biosolids) is applied, the accumulation of potential pollutants (including arsenic, cadmium, copper, lead, mercury, selenium, and zinc) in the soil shall be monitored in accordance with the US Code, Reference 40 CFR, Parts 403 and 503, and/or any applicable state and local laws or regulations. Refer to practice standard Waste Management (code 633) for additional guidance.

Additional Criteria to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere

USEPA-designated non-attainment areas for criteria atmospheric pollutants that are nutrient management-related can be found at <http://www.epa.gov/oar/oagps/greenbk>. Within these areas, any component(s) of nutrient management (i.e., amount, source, placement, form, timing of application) identified by risk assessment tools as a potential source of atmospheric pollutants shall be adjusted, as necessary, to minimize the loss(es).

When tillage can be performed, surface applications of manure and fertilizer nitrogen formulations that are subject to volatilization on the soil surface (e.g., urea) shall be

incorporated into the soil within 24 hours after application.

When manure or organic by-products are applied to grassland, hayland, pasture or minimum-till areas the rate, form and timing of application(s) shall be managed to minimize volatilization losses.

When liquid forms of manure are applied with irrigation equipment, operators will select weather conditions during application that will minimize volatilization losses.

Operators will handle and apply poultry litter or other dry types of animal manures when the potential for wind-driven loss is low and there is less potential for transport of particulates into the atmosphere.

Weather and climatic conditions during manure or organic by-product application(s) shall be recorded and maintained in accordance with the operation and maintenance section of this standard.

Additional Criteria to Improve the Physical, Chemical and Biological Condition of the Soil

Nutrients shall be applied and managed in a manner that maintains or improves the physical, chemical and biological condition of the soil.

Minimize the use of nutrient sources with high salt content unless provisions are made to leach salts below the crop root zone.

To the extent practicable nutrients shall not be applied when the potential for soil compaction and rutting is high.

CONSIDERATIONS

The use of management activities and technologies listed in this section may improve both the production and environmental performance of nutrient management systems. Document the activity or technology in the nutrient management plan. Note additional management to perform the activity and/or technology.

Action should be taken to protect National Register listed and other eligible cultural resources.

The nutrient budget should be reviewed annually to determine if any changes are needed for the next planned crop.

For sites on which there are special environmental concerns, other sampling techniques may be appropriate. These include soil profile sampling for nitrogen, Pre-Sidedress Nitrogen Test (PSNT), Pre-Plant Soil Nitrate Test (PPSN) or soil surface sampling for phosphorus accumulation or pH changes.

Additional practices to enhance the producer's ability to manage manure effectively include modification of the animal's diet to reduce the manure nutrient content, or utilizing manure amendments that stabilize or tie-up nutrients.

When available soils test information should be no older than one year when developing new plans, particularly if animal manures are to be used as a nutrient source. If no current soils tests are available, it is recommended that testing be completed within a year to establish base-line information.

Excessive levels of some nutrients can cause induced deficiencies of other nutrients.

If increases in soil phosphorus levels are expected, consider a more frequent (annual) soil testing interval.

To manage the conversion of nitrogen in manure or fertilizer, use products or materials (e.g. nitrification inhibitors, urease inhibitors and slow or controlled release fertilizers) that more closely match nutrient release and availability for plant uptake. These materials may improve the nitrogen use efficiency (NUE) of the nutrient management system by reducing losses of nitrogen into water and/or air.

Additional information on application rates for other nutrients can be obtained from current NebGuides or Extension Circulars (refer to Appendix A for a complete list of references).

- Sulfur – Sulfur deficiencies generally occur only in sandy soils. Research, however, has shown that applying sulfur to sandy soils will not always increase yields. Studies have shown that the organic matter content of the soil also must be a consideration.
- Iron – Most soils in Nebraska contain adequate amounts of iron, yet iron

chlorosis (yellowing) occurs in some areas of the state in some crops. Deficiency symptoms will appear primarily on younger leaves. Some crops grown in Nebraska are quite tolerant to low levels of available iron, while others, such as soybean, sorghum and field beans are not.

- Zinc – Some soils in Nebraska are deficient in zinc. Deficient soils often have a high pH, are low in organic matter, and occur where land leveling, terrace construction or erosion have removed topsoil. Corn is the most sensitive crop to low soil zinc levels. Zinc deficiency may occur on newer leaves first. In corn and sorghum, it is characterized by interveinal whitish bands on either side of the midrib. Zinc-deficient soybeans have stunted stems and interveinal chlorosis on younger leaves.

Considerations to Minimize Agricultural Nonpoint Source Pollution of Surface and Ground Water.

Erosion control and runoff reduction practices can improve soil nutrient and water storage, infiltration, aeration, tilth, diversity of soil organisms and protect or improve water and air quality (Consider installation of one or more NRCS FOTG, Section IV – Conservation Practice Standards).

Cover crops can effectively utilize, tie-up and/or recycle residual nitrogen. Refer to Conservation Standard for Cover Crop (Code 340) for appropriate cover crops to use for this purpose.

Apply nutrient materials uniformly to the application area. Application methods and timing that reduce the risk of nutrients being transported to ground and surface waters, or into the atmosphere include:

- Split applications of nitrogen to provide nutrients at the times of maximum crop utilization,
- Use stalk-test to minimize risk of over applying nitrogen in excess of crop needs,
- Avoid winter nutrient application for spring seeded crops,
- Band applications of phosphorus near the seed row,

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- Incorporate surface applied manures or organic by-products as soon as possible after application to minimize nutrient losses,
- Delay field application of animal manures or organic by-products if precipitation capable of producing runoff and erosion is forecast within 24 hours of the time of the planned application.

Considerations to Protect Air Quality by Reducing Nitrogen and/or Particulate Emissions to the Atmosphere.

Odors associated with the land application of manures and organic by-products can be offensive to the occupants of nearby homes. Avoid applying these materials upwind of occupied structures when residents are likely to be home (evenings, weekends and holidays).

When applying manure with irrigation equipment, modifying the equipment can reduce the potential for volatilization of nitrogen from the time the manure leaves the application equipment until it reaches the surface of the soil (e.g., reduced pressure, drop down tubes for center pivots). N volatilization from manure in a surface irrigation system will be reduced when applied under a crop canopy.

When planning nutrient applications and tillage operations, encourage soil carbon buildup while discouraging greenhouse gas emissions (e.g., nitrous oxide N₂O, carbon dioxide CO₂).

CAFO operations seeking permits under USEPA regulations (40 CFR Parts 122 and 412) should consult with their respective state permitting authority for additional criteria.

PLANS AND SPECIFICATIONS

Plans and specifications for nutrient management shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s), using nutrients to achieve production goals and to prevent or minimize resource impairment. Nutrient Management (S-590) practice specification and appropriate references in S-590 will be provided to the client. Other references listed in Nutrient Management 590 Appendix A References,

such as Neb-Guides or Extension Circulars shall be provided to the client as appropriate.

Nutrient management plans shall include a statement that the plan was developed based on requirements of the current standard and any applicable Federal, state, or local regulations, policies, or programs, which may include the implementation of other practices and/or management activities. Changes in any of these requirements may necessitate a revision of the plan.

See NPPH State Supplement, Section III – Nutrient Management Planning and Reporting Requirements (eFOTG, Section I. F. Conservation Planning) for a listing of components required in the nutrient management plan.

If increases in soil phosphorus levels are expected, the nutrient management plan shall document:

- The soil phosphorus levels at which it may be desirable to convert to phosphorus based planning,
- Results of appropriate risk assessment tools to document the relationship between soil phosphorus levels and potential for phosphorus transport from the field,
- The potential for soil phosphorus drawdown from the production and harvesting of crops, and
- Management activities or techniques used to reduce the potential for phosphorus loss.

OPERATION AND MAINTENANCE

The owner/client is responsible for safe operation and maintenance of this practice including all equipment. Operation and maintenance addresses the following:

- Periodic plan review to determine if adjustments or modifications to the plan are needed. As a minimum, plans will be reviewed and revised with each soil test cycle.
- Significant changes in animal numbers and/or feed management will necessitate additional manure sampling and analyses to establish a revised average nutrient content.

- Protection of fertilizer and organic by-product storage facilities from weather and accidental leakage or spillage.
- Calibration of application equipment to ensure uniform distribution of material at planned rates.
- Documentation of the actual rate at which nutrients were applied. When the actual rates used differ from the recommended and planned rates, records will indicate the reasons for the differences.
- Maintaining records to document plan implementation. As applicable, records include:
 - Soil, plant tissue, water, manure, and organic by-product analyses resulting in recommendations for nutrient application,
 - Quantities, analyses and sources of nutrients applied,
 - Dates and method(s) of nutrient applications,
 - Weather conditions and soil moisture at the time of application; lapsed time to manure incorporation, rainfall or irrigation event,
 - Crops planted, planting and harvest dates, yields, and crop residues removed, and
 - Dates of plan review, name of reviewer, and recommended changes resulting from the review.

Records should be maintained for five years; or for a period longer than five years if required by other Federal, state or local ordinances, or program or contract requirements.

Workers should be protected from and avoid unnecessary contact with plant nutrient sources. Extra caution must be taken when handling ammoniacal nutrient sources, or when dealing with organic wastes stored in unventilated enclosures.

Material generated from cleaning nutrient application equipment should be utilized in an environmentally safe manner. Excess material should be collected and stored or field applied in an appropriate manner.

Nutrient containers should be recycled in compliance with state and local guidelines or regulations.

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