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CLERK OF THE BOARD
OF COUNTY COMMISSIONERS
MIAMI-DADE COUNTY, FLORIDA

Memorandum

MIAMI-DADE COUNTY

Date: July 21, 2009

To: Honorable Chairman Dennis C. Moss and Members, Board of County Commissioners

From: George M. Burgess
County Manager

Agenda Item No. 14(A)(46)

Resolution No. R-1014-09

Subject: Resolution Authorizing Execution of Agreement Number 4600001822 with the South Florida Water Management District for the Biscayne Bay Surface Water Quality and Biological Monitoring Program

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Recommendation
It is recommended that the Board approve the attached resolution authorizing execution of Agreement Number 4600001822 with the South Florida Water Management District (SFWMD). This Agreement will provide Miami-Dade County with $1,148,395 over a five year period to continue surface water quality and biological monitoring in Biscayne Bay and its watershed tributaries.

Scope
This Agreement encompasses parts of Commission Districts 2 (Commissioner Rolle), 3 (Commissioner Edmonson), 4 (Commissioner Heyman), 5 (Commissioner Barreiro), 6 (Commissioner Sosa), 7 (Commissioner Gimenez), 8 (Commissioner Sorenson), 9 (Commissioner Moss), 10 (Commissioner Souto), 11 (Commissioner Martinez), 12 (Commissioner Diaz) and 13 (Commissioner Seijas).

Fiscal Impact/Funding Source
This Agreement provides the County with $216,305 in FY09-10, $222,795 in FY10-11, $229,478 in FY11-12, $236,363 in FY12-13 and $243,454 in FY13-14 for a five year total of $1,148,395. DERM will provide an equal funding match from the Stormwater Utility towards this project.

Track Record/Monitor
The Director of DERM will monitor this contract.

Background
DERM has coordinated the Biscayne Bay Restoration and Enhancement Program since 1979, conducting comprehensive pollution control/enforcement activities and environmental monitoring/restoration projects throughout Miami-Dade County. The Biscayne Bay Surface Water Quality and Biological Monitoring Program has been an important element of this effort and has been credited by the SFWMD Surface Water Improvement and Management (SWIM) Plan as having effectively demonstrated water quality impacts at several locations. The data collected from the monitoring program is a primary source in determining the success of achieving SWIM Plan water quality targets for Biscayne Bay.

The overall objective of the program is to create and maintain a long-term data set for characterization of water quality through various climatic cycles, events and watershed changes. The data are used to address Miami-Dade County water quality permitting issues and National Pollutant Discharge Elimination System activities and to develop non-degradation and Total Maximum Daily Load targets for the Biscayne Bay Watershed. Several monitoring stations are also named in the Comprehensive Everglades Restoration Plan (CERP) Monitoring and Assessment Plan as key stations for assessing the environmental response of the watershed to the activities associated with the CERP.

The existing Agreement Number ML070553 with the SFWMD was approved by the Board on July 18, 2006 as Resolution No. R-866-06 and will expire September 30, 2009.

Assistant County Manager

MEMORANDUM

(Revised)

TO: Honorable Chairman Dennis C. Moss and Members, Board of County Commissioners

DATE: July 21, 2009

FROM: R. A. Cuevas, Jr. County Attorney

SUBJECT: Agenda Item No. 14(A)(46)

Please note any items checked.

✓ **"4-Day Rule" ("3-Day Rule" for committees) applicable if raised**

_____ **6 weeks required between first reading and public hearing**

_____ **4 weeks notification to municipal officials required prior to public hearing**

_____ **Decreases revenues or increases expenditures without balancing budget**

_____ **Budget required**

_____ **Statement of fiscal impact required**

_____ **Bid waiver requiring County Mayor's written recommendation**

_____ **Ordinance creating a new board requires detailed County Manager's report for public hearing**

_____ **Housekeeping item (no policy decision required)**

_____ **No committee review**

Approved _____ Mayor

Veto _____

Override _____

Agenda Item No. 14(A)(46)

7-21-09

RESOLUTION NO. **R-1014-09**

RESOLUTION AUTHORIZING EXECUTION OF AGREEMENT NUMBER 4600001822 WITH THE SOUTH FLORIDA WATER MANAGEMENT DISTRICT FOR THE BISCAYNE BAY SURFACE WATER QUALITY AND BIOLOGICAL MONITORING PROGRAM; AND AUTHORIZING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO EXERCISE ANY AND ALL OTHER RIGHTS CONTAINED THEREIN

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board authorizes the County Mayor or County Mayor's designee to execute Agreement Number 4600001822 between Miami-Dade County and the South Florida Water Management District for the Biscayne Bay Surface Water Quality and Biological Monitoring Program, in substantially the form attached hereto and made part hereof; authorizes the County Mayor or County Mayor's designee to execute amendments to this agreement for time extension and to accept additional funds that may become available for this agreement; and authorizes the County Mayor or County Mayor's designee to exercise the provisions contained therein.

The foregoing resolution was offered by Commissioner **Joe A. Martinez**, who moved its adoption. The motion was seconded by Commissioner **Rebeca Sosa** and upon being put to a vote, the vote was as follows:

Dennis C. Moss, Chairman	**aye**		
Jose "Pepe" Diaz, Vice-Chairman	**aye**		
Bruno A. Barreiro	**aye**	Audrey M. Edmonson	**aye**
Carlos A. Gimenez	**aye**	Sally A. Heyman	**aye**
Barbara J. Jordan	**aye**	Joe A. Martinez	**aye**
Dorrin D. Rolle	**aye**	Natacha Seijas	**aye**
Katy Sorenson	**aye**	Rebeca Sosa	**aye**
Sen. Javier D. Souto	**aye**		

The Chairperson thereupon declared the resolution duly passed and adopted this 21st day of July, 2009. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: **DIANE COLLINS**
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency

Peter S. Tell

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ORIGINAL

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
LOCAL GOVERNMENTAL AGREEMENT

AGREEMENT NO. 4600001822

BETWEEN THE

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

AND

MIAMI-DADE COUNTY

THIS AGREEMENT is entered into as of _____ by and between the South Florida Water Management District (**DISTRICT**) and Miami-Dade County (**COUNTY**).

WHEREAS, the **DISTRICT** is a public corporation of the State of Florida, created by the Florida Legislature and given those powers and responsibilities enumerated in Chapter 373, Florida Statutes, to include entering into contracts with public agencies, private corporations or other persons; and

WHEREAS, the **DISTRICT** desires to provide financial assistance to the **COUNTY** for the Biscayne Bay Surface Water Quality and Biological Monitoring Program; and

WHEREAS, the Governing Board of the **DISTRICT** at its August 13, 2009 meeting, approved entering into this **AGREEMENT** with the **COUNTY**; and

WHEREAS, the **COUNTY** warrants and represents that it has no obligation or indebtedness that would impair its ability to fulfill the terms and conditions of this **AGREEMENT**; and

NOW, THEREFORE, in consideration of the covenants and representations set forth herein and other good and valuable consideration, the receipt and adequacy of which is hereby acknowledged, the parties agree as follows:

1. The **DISTRICT** agrees to contribute funds and the **COUNTY** agrees to perform the work set forth in Exhibit "A" attached hereto and made a part hereof, subject to availability of funds and in accordance with their respective authorities for the performance of monthly surface water quality monitoring throughout Biscayne Bay and its watershed canals, analyses of collected samples, data management and reporting.

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2. The period of performance of this **AGREEMENT** shall commence on October 1, 2009 and shall continue for a period of five (5) year(s).

3. The total **DISTRICT** contribution shall not exceed the amount of One Million One Hundred Forty-eight Thousand Three Hundred Ninety-four Dollars and Sixty-seven Cents ($1,148,394.67). The **DISTRICT** will provide the full amount based on the Payment and Deliverable Schedule set forth in Exhibit "B", which is attached hereto and made a part of this **AGREEMENT**. The **DISTRICT's** contribution is subject to adequate documentation to support actual expenditures within the not-to-exceed **AGREEMENT** funding limitation of $1,148,394.67. In no event shall the **DISTRICT** be liable for any contribution hereunder in excess of this amount. If the total consideration for this **AGREEMENT** is subject to multi-year funding allocations, funding for each applicable fiscal year of this **AGREEMENT** will be subject to Governing Board budgetary appropriation. In the event the **DISTRICT** does not approve funding for any subsequent fiscal year, this **AGREEMENT** shall terminate upon expenditure of the current funding, notwithstanding other provisions in this **AGREEMENT** to the contrary. The **DISTRICT** will notify the **COUNTY** in writing after the adoption of the final **DISTRICT** budget for each subsequent fiscal year if funding is not approved for this **AGREEMENT**.

4. The **COUNTY** shall submit quarterly financial reports to the **DISTRICT** providing a detailed accounting of all expenditures incurred hereunder throughout the term of this **AGREEMENT**. The **COUNTY** shall report and document the amount of funds expended per month during the quarterly reporting period and the **AGREEMENT** expenditures to date within the maximum not-to-exceed **AGREEMENT** funding limitation.

5. The **COUNTY** shall provide in-kind services in the amount of One Million One Hundred Forty-eight Thousand Three Hundred Ninety-four Dollars and Sixty-seven Cents ($1,148,394.67) in conformity with the laws and regulations governing the **COUNTY**.

6. All work to be performed under this **AGREEMENT** is set forth in Exhibit "A", Statement of Work, which is attached hereto and made a part of this **AGREEMENT**. The **COUNTY** shall submit quarterly progress reports detailing the status of work to date for each task. The work specified in Exhibit "A" shall be under the direction of the **COUNTY** but shall be open to periodic review and inspection by either party. No work set forth in Exhibit "A" shall be performed beyond September 30, 2014 unless authorized through execution of an amendment to cover succeeding periods.

7. The **COUNTY** is hereby authorized to contract with third parties (subcontracts) for services awarded through a competitive process required by Florida Statutes. The **COUNTY** shall not subcontract, assign or transfer any other work under this **AGREEMENT** without the prior written consent of the **DISTRICT's** Project Manager. The **COUNTY** agrees to be responsible for the fulfillment of all work elements included in any subcontract and agrees to be responsible for the payment of all monies due under any subcontract. It is understood and agreed by the **COUNTY** that the **DISTRICT** shall

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not be liable to any subcontractor for any expenses or liabilities incurred under the subcontract(s).

8. Both the **DISTRICT** and the **COUNTY** shall have joint ownership rights to all work items, including but not limited to, all documents, technical reports, research notes, scientific data, computer programs, including the source and object code, which are developed, created or otherwise originated hereunder by the other party, its subcontractor(s), assign(s), agent(s) and/or successor(s) as required by the Exhibit "A", Statement of Work. Both parties' rights to deliverables received under this **AGREEMENT** shall include the unrestricted and perpetual right to use, reproduce, modify and distribute such deliverables at no additional cost to the other party. Notwithstanding the foregoing, ownership of all equipment and hardware purchased by the **COUNTY** under this **AGREEMENT** shall be deemed to be the property of the **COUNTY** upon completion of this **AGREEMENT**. The **COUNTY** shall retain all ownership to tangible property.

9. The **COUNTY**, to the extent permitted by law, assumes any and all risks of personal injury, bodily injury and property damage attributable to negligent acts or omissions of the **COUNTY** and the officers, employees, servants and agents thereof. The **COUNTY** represents that it is self-funded for Worker's Compensation and liability insurance, covering bodily injury, personal injury and property damage, with such protection being applicable to the **COUNTY,** its officers and employees while acting within the scope of their employment during performance of under this **AGREEMENT**. In the event that the **COUNTY** subcontracts any part or all of the work hereunder to any third party, the **COUNTY** shall require each and every subcontractor to identify the **DISTRICT** as an additional insured on all insurance policies as required by the **COUNTY**. Any contract awarded by the **COUNTY** shall include a provision whereby the **COUNTY's** subcontractor agrees to indemnify, pay on behalf, and hold the **DISTRICT** harmless from all damages arising in connection with the **COUNTY's** subcontract.

10. The **COUNTY** and the **DISTRICT** further agree that nothing contained herein shall be construed or interpreted as (1) denying to either party any remedy or defense available to such party under the laws of the State of Florida; (2) the consent of the State of Florida or its agents and agencies to be sued; or (3) a waiver of sovereign immunity of the State of Florida beyond the waiver provided in Section 768.28, Florida Statutes.

11. The parties to this **AGREEMENT** are independent entities and are not employees or agents of the other parties. Nothing in this **AGREEMENT** shall be interpreted to establish any relationship other than that of independent entities, between the **DISTRICT**, the **COUNTY**, their employees, agents, subcontractors or assigns, during or after the term of this **AGREEMENT**. The parties to this **AGREEMENT** shall not assign, delegate or otherwise transfer their rights and obligations as set forth in this **AGREEMENT** without the prior written consent of the other parties. Any attempted assignment in violation of this provision shall be void.

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12. The parties to this **AGREEMENT** assure that no person shall be excluded on the grounds of race, color, creed, national origin, handicap, age or sex, from participation in, denied the benefits of, or be otherwise subjected to discrimination in any activity under this **AGREEMENT**.

13. The **COUNTY**, its employees, subcontractors or assigns, shall comply with all applicable federal, state and local laws and regulations relating to the performance of this **AGREEMENT**. The **DISTRICT** undertakes no duty to ensure such compliance, but will attempt to advise the **COUNTY**, upon request, as to any such laws of which it has present knowledge.

14. Either party may terminate this **AGREEMENT** at any time for convenience upon thirty (30) calendar days prior written notice to the other party. In the event of termination, all funds not expended by the **COUNTY** for authorized work performed through the termination date shall be returned to the **DISTRICT** within sixty (60) days of termination.

15. The **COUNTY** shall allow public access to all project documents and materials in accordance with the provisions of Chapter 119, Florida Statutes. Should the **COUNTY** assert any exemptions to the requirements of Chapter 119 and related Statutes, the burden of establishing such exemption, by way of injunctive or other relief as provided by law, shall be upon the **COUNTY**.

16. The **COUNTY** shall maintain records and the **DISTRICT** shall have inspection and audit rights below. The **COUNTY** shall similarly require each subcontractor to maintain and allow access to such records for audit purposes:

A. Maintenance of Records: The **COUNTY** shall maintain all financial and non-financial records and reports directly or indirectly related to the negotiation or performance of this **AGREEMENT** including supporting documentation for any service rates, expenses, research or reports. Such records shall be maintained and made available for inspection for a period of five (5) years from the expiration date of this **AGREEMENT**.

B. Examination of Records: The **DISTRICT** or designated agent shall have the right to examine in accordance with generally accepted governmental auditing standards all records directly or indirectly related to this **AGREEMENT**. Such examination may be made only within five (5) years from the expiration date of this **AGREEMENT**.

C. Extended Availability of Records for Legal Disputes: In the event that the **DISTRICT** should become involved in a legal dispute with a third party arising from performance under this **AGREEMENT**, the **COUNTY** shall extend the period of maintenance for all records relating to the **AGREEMENT** until the final disposition of the legal dispute. All such records shall be made readily available to the **DISTRICT**.

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17. Whenever the **DISTRICT's** contribution includes state or federal appropriated funds, the **COUNTY** shall, in addition to the inspection and audit rights set forth in paragraph #16 above, maintain records and similarly require each subcontractor to maintain and allow access to such records in compliance with the requirements of the Florida State Single Audit Act and the Federal Single Audit Act, as follows:

A. Maintenance of Records: The **DISTRICT** shall provide the necessary information to the **COUNTY** as set forth in Exhibit "C". The **COUNTY** shall maintain all financial/non-financial records through:

(1) Identification of the state or federal awarding agency, as applicable
(2) Project identification information included in the Catalog of State Financial Assistance (CSFA) or the Catalog of Federal Financial Assistance (CFDA), as applicable
(3) Audit and accountability requirements for state projects as stated in the Single Audit Act and applicable rules of the Executive Office of Governor, rules of the Chief Financial Officer and rules of the Auditor General and the State Projects Compliance Supplement
(4) Audit/accountability requirements for federal projects as imposed by federal laws and regulations
(5) Submission of the applicable single audit report to the **DISTRICT**, as completed per fiscal year

B. Examination of Records: The **DISTRICT** or designated agent, the state awarding agency, the state's Chief Financial Officer and the state's Auditor General and/or federal awarding agency shall have the right to examine the **COUNTY's** financial and non-financial records to the extent necessary to monitor the **COUNTY's** use of state or federal financial assistance and to determine whether timely and appropriate corrective actions have been taken with respect to audit findings and recommendations which may include onsite visits and limited scope audits.

18. All notices or other communication regarding this **AGREEMENT** shall be in writing and forwarded to the attention of the following individuals:

South Florida Water Management District

Attn: Monique Laham-Pass, Project Manager
Telephone No. (561) 753-2400 Ext. 4756
Attn: Bernadette Harrison, Contract Specialist
Telephone No. (561) 682-6378
P.O. Box 24680
3301 Gun Club Road
West Palm Beach, FL 33416-4680

Miami-Dade County

Attn: Forest Shaw, Project Manager
Department of Environmental Resources Management
701 NW 1st Court, Ste. 400
Miami, FL 33136
Telephone No. (305) 372-6864

19. **COUNTY** recognizes that any representations, statements or negotiations made by **DISTRICT** staff do not suffice to legally bind **DISTRICT** in a contractual relationship unless they have been reduced to writing and signed by an authorized **DISTRICT**

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representative. This **AGREEMENT** shall inure to the benefit of and shall be binding upon the parties, their respective assigns, and successors in interest.

20. This **AGREEMENT** may be amended, extended or renewed only with the written approval of the parties. The **DISTRICT** shall be responsible for initiating any amendments to this **AGREEMENT**, if required.

21. This **AGREEMENT**, and any work performed hereunder, is subject to the Laws of the State of Florida. Nothing in this **AGREEMENT** will bind any of the parties to perform beyond their respective authority, nor does this **AGREEMENT** alter the legal rights and remedies which the respective parties would otherwise have, under law or at equity.

22. Should any term or provision of this **AGREEMENT** be held, to any extent, invalid or unenforceable, as against any person, entity or circumstance during the term hereof, by force of any statute, law, or ruling of any forum of competent jurisdiction, such invalidity shall not affect any other term or provision of this **AGREEMENT**, to the extent that the **AGREEMENT** shall remain operable, enforceable and in full force and effect to the extent permitted by law.

23. Failures or waivers to insist on strict performance of any covenant, condition, or provision of this **AGREEMENT** by the parties shall not be deemed a waiver of any of its rights or remedies, nor shall it relieve the other party from performing any subsequent obligations strictly in accordance with the terms of this **AGREEMENT**. No waiver shall be effective unless in writing and signed by the party against whom enforcement is sought. Such waiver shall be limited to provisions of this **AGREEMENT** specifically referred to therein and shall not be deemed a waiver of any other provision. No waiver shall constitute a continuing waiver unless the writing states otherwise.

24. Any dispute arising under this **AGREEMENT** which cannot be readily resolved shall be submitted jointly to the signatories of this **AGREEMENT** with each party agreeing to seek in good faith to resolve the issue through negotiation or other forms of non-binding alternative dispute resolution mutually acceptable to the parties. A joint decision of the signatories, or their designees, shall be the disposition of such dispute.

25. This **AGREEMENT** states the entire understanding and agreement between the parties and supersedes any and all written or oral representations, statements, negotiations, or agreements previously existing between the parties with respect to the subject matter of this **AGREEMENT**.

26. Any inconsistency in this **AGREEMENT** shall be resolved by giving precedence in the following order:
(a) Terms and Conditions outlined in preceding paragraphs 1 – 24
(b) Exhibit "A" Statement of Work
(c) all other exhibits, attachments and documents specifically incorporated herein by reference

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IN WITNESS WHEREOF, the parties or their duly authorized representatives hereby execute this **AGREEMENT** on the date first written above.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT
BY ITS GOVERNING BOARD

By: _____

Frank Hayden, Procurement Director

SFWMD PROCUREMENT APPROVED

By: Bernadette Harrison

Date: 6/4/09

MIAMI DADE COUNTY

By: _____

Typed Name: _____

Title: _____

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EXHIBIT "A"
STATEMENT OF WORK

BISCAYNE BAY SURFACE WATER QUALITY AND BIOLOGICAL MONITORING PROGRAM

1.0 INTRODUCTION

This Cooperative Agreement with Miami-Dade County, Department of Environmental Resources Management (County) and the South Florida Water Management District (District) continues the long-term water quality monitoring network in South Florida estuaries for five (5) years (October 01, 2009 to September 30, 2014). This cooperative program has established a substantial period of record that serves as a baseline to evaluate estuarine restoration efforts as well as to identify potential impacts on this valuable resource from upstream water management activities.

The water quality monitoring network established in this Agreement is identified as a primary source of data for evaluation of effects of various Comprehensive Everglades Restoration Plan (CERP) projects on Biscayne Bay. It is also the source of data for water quality assessment within the Southern Estuaries element of the CERP RECOVER Monitoring and Assessment Plan.

2.0 PROJECT PURPOSE, GOALS AND OBJECTIVES

The District and the County initiated and maintained this monitoring program to identify areas of ecological concern and to provide a clear understanding of baseline conditions using both systematic and investigative monitoring. The main purpose has been to characterize water quality spatially and seasonally, and to detect long-term trends. Additionally, the program has also been used to identify specific "hotspots", develop and monitor comprehensive stormwater improvement programs, develop non-degradation criteria, and develop freshwater response relationships.

An objective of the program is to maintain the long-term dataset for characterization of water quality through various climatic cycles, events and watershed changes. County data is used to address Miami-Dade County water quality permitting issues and to support various non-degradation and Total Maximum Daily Load (TMDL) planning activities for the Biscayne Bay Watershed. As such, the focus of the County's sampling is in canals and receiving waters in Biscayne Bay. Several County stations are named in RECOVER's Monitoring and Assessment Plan (MAP) as key stations for assessment of environmental response to the CERP.

3.0 SCOPE OF WORK

The County shall conduct monthly surface water quality monitoring at eighty-five (85) stations throughout Biscayne Bay and its watershed canals. Water samples shall be

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collected and analyzed for physical, chemical and biological parameters. Additionally the county shall conduct monitoring at eleven (11) benthic stations and a rapid visual evaluation at 102 random sites in Biscayne Bay. Each established benthic site will be sampled annually during the month of June

3.1 Water Quality Sample Collection and Analysis Protocol:

a) The County shall be responsible for following the requirements under Florida Administrative Code (F.A.C.) 62-160 Florida Department of Environmental Protection (FDEP) Quality Assurance Rule, the Quality Assurance Project Plan (QAPP), and the applicable Field Sampling Standard Operating Procedures (SOPs) for the collection of samples. In accordance with the Quality Assurance Rule, the County must possess and maintain a Field Quality Manual in accordance with FDEP SOP 001/01 Section FA3300.

b) Any variances from the minimum requirements under F.A.C. 62-160, the QAPP, or the FDEP SOPs must be approved in writing (email is adequate) by the District Field Contract Manager prior to implementation. This includes any changes in sampling procedures or quality assurance/quality control (QA/QC) protocols.

c) The County shall ensure that only qualified and properly trained staff conduct sampling and/or field measurements for this project. The County staff shall demonstrate knowledge of FDEP Sampling SOPs and QAPP for the collection method requested within this Agreement, and the operation of field instruments/equipment. The County shall document and keep a permanent file of training in employee's files to be available during audits and/ or if requested.

d) The County shall submit a list of sampling personnel that are or will be assigned to the project, as well as any updates on personnel to the District Contract Manager during the term of this Agreement.

e) The County shall provide all deployed equipment, multi-parameter water quality probes and calibration standards. The County shall maintain an adequate stock of all supplies to ensure that measurements are collected according to schedule.

f) All field probes used for field measurements shall be calibrated before and verified after each day of sampling and documented accordingly per FDEP-SOP requirements. All calibration documentation shall be provided to the District Contract Manager as a part of the quarterly report.

g) The County shall ensure that the proper equipment protocols, as identified in the QAPP, are used to collect each sample. The County laboratory and any subcontract laboratory that samples may be sent shall be National Environmental Laboratory Accreditation Program (NELAP) certified as per Chapter 64E F.A.C. All laboratories shall be certified for all specific method/analyte combinations that are analyzed for this project.

h) The District may review field sampling and laboratory quality assurance/quality control (QA/QC) procedures and conduct field and laboratory audits as desired at any time.

i) All in-situ field measurements and site conditions observed during sample collection shall be recorded on waterproof field sheets using indelible marker as directed by the DEP SOP 001/01.

j) The County shall be notified, in writing, 30 days in advance of any project related changes, including those related to sampling frequencies, parameter lists, etc.

k) If the District detects a problem with a sample result, the District Contract Manager shall notify the County Project Manager in writing via email. The County shall address and resolve quality assurance issues within 45 days of notification. The District Contract Manager shall communicate any deficiencies to the County prior to payment authorization. In addition, the District will not reimburse the County for data that are not of acceptable quality.

4.0 WORK BREAKDOWN STRUCTURE

Task 1 - Quality Assurance Project Plan and Quality Manual

A Quality Assurance Project Plan (QAPP) and the Quality Manual (QM) shall be submitted to the District within one (1) month of the contract execution.

All sampling and analytical protocols shall follow the FDEP Quality Assurance Rule 62-160. The County shall follow the FDEP standard operating procedure for sample collection. Any variance, as determined by the District Contract Manager and District Quality Assurance personnel shall be approved by FDEP prior to implementation, whereas other variances must be pre-approved in writing to the District Contract Manager prior to implementation.

A. Water Quality Monitoring

The quality system that will be implemented for sample collection (surface water quality monitoring) through this Plan shall explicitly commit to incorporating procedures that shall reduce systematic errors within specified tolerable limits. In addition, the County will have to document Quality Control (QC) procedures and evaluate the quality of the data being produced (Appendix A).

The County laboratory shall be NELAP accredited (primary or secondary) with the Florida Department of Health (FDOH) under Chapter 64E-1, F.A.C., where such certification is required by Rule 62-160.300, F.A.C. The laboratory shall be certified for all specific method/analyte combinations that are analyzed for this project. Alternate

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laboratory methods may be used only after they have been approved according to the requirements of Rules 62-160.220 and 62-160.330, F.A.C and approved by the District Contract Manager.

District QA staff may assess the County laboratory's performance as desired. For example, District staff or their designees may conduct laboratory and field quality assurance audits, submit blind and split samples for analysis, and review analytical and field sampling methods. In addition, the County laboratory shall participate in Round Robin and laboratory certification exercises at the District's request. The District may require copies of laboratory bench notes during audits or when necessary to evaluate data.

The County laboratory shall notify the District Contract Manager immediately if it or its subcontractor loses certification for any parameter(s) analyzed for the District. When requested, the laboratory shall provide the District with results of all performance evaluation, as well as audit reports. The District may also ask for MDL studies and QC charts during the duration of the Agreement. The laboratory may not change the method without prior written approval from the District. If the laboratory's proposed method is not listed in the approved Quality Manual, they shall provide a FDEP-approved Method Validation package for each method.

All field activities including on-site tests and sample collection shall follow all applicable procedures described in the current version of the FDEP SOP 001/01, the Project QAPP and the Miami-Dade Department of Environmental Resources Management (DERM) Quality Manual (QM). Alternate field procedures may be used only after they have been approved according to the requirements of Rules 62-160.220 and 62-160.330 F.A.C and approved by the District Contract Manager.

B. Submerged Aquatic Vegetation

The County shall implement a quality system in sample collection (submerge aquatic vegetation) through this Plan and shall explicitly commit to incorporating procedures that will reduce systematic errors within specified tolerable limits. In addition, the respondent will have to document Quality Control (QC) procedures and evaluate the quality of the data being produced.

Methods shall adhere to standardized methods published by the District, the Florida Department of Environmental Protection (FDEP) or the United States Environmental Protection Agency (EPA). The County shall validate all submerged aquatic vegetation survey data following quality assurance (QA) requirements outlined in DEP/QA-022./02. Any deviation from published District, FDEP, or EPA procedures must be approved by the District Contract Manager and the District QA Officer.

Task 1 Deliverable: Two (2) copies of the Quality Assurance Project Plan and Quality Manual

Due Date: Within one (1) month of Agreement Execution

Task 2 - Surface Water Quality Monitoring

The integrated network consists of eighty-five (85) stations at which samples are collected and analyzed for physical, chemical and biological parameters to characterize water quality (Tables 1, 2, and 3 for parameter list and analytical method). The network shall include monthly sampling throughout Biscayne Bay (Figure 1 and Tables 4 and 5). The physical parameters include depth, temperature, pH, dissolved oxygen, specific conductance and salinity. Data for each physical parameter will be collected in the water column at 0.1 meter (m) below the surface, at one (1) meter (where depths allow) for canal sites and at 0.5 meter for bay sites, and approximately 0.1 m from the bottom. In addition, diffusive light (PAR) attenuation (Kd) will be measured in the water column at 56 bay sites. Surface water shall be collected at a depth of 1.0 m below the surface using a horizontal Niskin sampler for canal samples and 0.5 m using peristaltic pump with silicone tubing for all bay samples collected by boat, unless otherwise specified. A list of parameters is provided in Tables 1, 2, 3 and 5. The County shall perform analyses using the methods and method detection limits in Table 1. The District must be notified in advance and agree if methods or detection limits are changed.

The County shall locate monitoring stations using a Global Positioning System (GPS), during each trip. Temporal and spatial consistency in sampling is needed to reduce variation. There shall be intra-station consistency with respect to time of day and time of month in which the sample is taken. For example, these measurements shall be made at roughly the same time of day at each station. It is preferred that sampling be carried out on a routine schedule with a regular sampling sequence for each site. This effort to reduce variation involves adherence to quality control methods for all field measurements.

Task 2 Deliverable 1: Sample Collection

Due Date: In accordance with frequencies listed in Table 5; Scan of Field documentation due Friday of the following week.

Task 2 Deliverable 2: Analytical data for parameters listed in Table 1

Due Date: October, November and December data shall be submitted by January 30th; January, February and March data shall be submitted by April 30th; April, May and June data shall be submitted by July 30th; July and August data shall be submitted by September 28th; and September data shall be submitted as an addendum to the Quarterly Report by October 30th.

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Table 1 - Method codes and MDLs for analytical water quality parameters

Parameter	Method	MDL
Total Phosphorus	EPA 365.1	0.002 mg/L
Total Kjeldahl Nitrogen	EPA 351.2	0.08 µg/L
Total Ammonia Nitrogen	EPA 350.1	0.01 mg/L
Color	EPA 110.2	5 PCU
Turbidity	EPA 180.1	0.1 NTU
Hardness	SM 2340B	1 mg/L
Cadmium (Freshwater)	EPA 200.7	0.3 µg/L
Copper (Freshwater)	EPA 200.7	0.7 µg/L
Lead (Freshwater)	EPA 200.7	3.1 µg/L
Zinc (Freshwater)	EPA 200.7	2.0 µg/L
Ortho-Phosphate (filtered)	EPA 365.1	0.002 mg/L
Ammonia Nitrogen (filtered)	EPA 350.1	0.01 mg/L
NOx-N (filtered)	EPA 353.2	0.01 mg/L
Total Organic Carbon (TOC)	SM5301C	0.242 mg/L
Total Suspended Solids	EPA 160.2	6 mg/L
Chlorophyll-a	SM18 10200 H	0.16 µg/L

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Table 2- Surface Water Parameters

Parameter	Sampling Frequency
Temperature	Monthly
pH	Monthly
Dissolved Oxygen	Monthly
Specific Conductance	Monthly
Salinity	Monthly
Depth	Monthly
Photosynthetically Active Radiation (Kd)	Monthly
Total Phosphorus	Monthly
Ammonia Nitrogen	Monthly
Nitrate/Nitrite	Monthly
Total Kjeldahl Nitrogen	Monthly/ Bimonthly
Ortho-Phosphate	Monthly
Color	Monthly
Turbidity	Monthly
Chlorophyll	Monthly
Copper	Semi Annual
Lead	Semi Annual
Zinc	Semi Annual
Cadmium	Semi Annual
Hardness	Semi Annual
Total Organic Carbon	Monthly
Total Suspended Solids	Quarterly

Table 3- In Situ parameters, analytical methods, reporting units and accuracy limits*

Parameter	Analytical Method	Reporting Units	Accuracy Limits
Oxygen, dissolved	SM4500-O G	mg/L	+/- 0.2 mg/L of saturation chart at temp
Specific Conductance	SM2510B	µS/cm	+/- 5% of the true value of the KCl standard
pH	SM4500H$^+$B	pH units	+/- 0.2 pH Units
Temperature	SM2550B	°C	+/- 0.2 °C
Salinity	SM2520B	ppt	NA

*The accuracy limits are not to be confused with the acceptance criteria described in the QAPP and in the FDEP SOPs.

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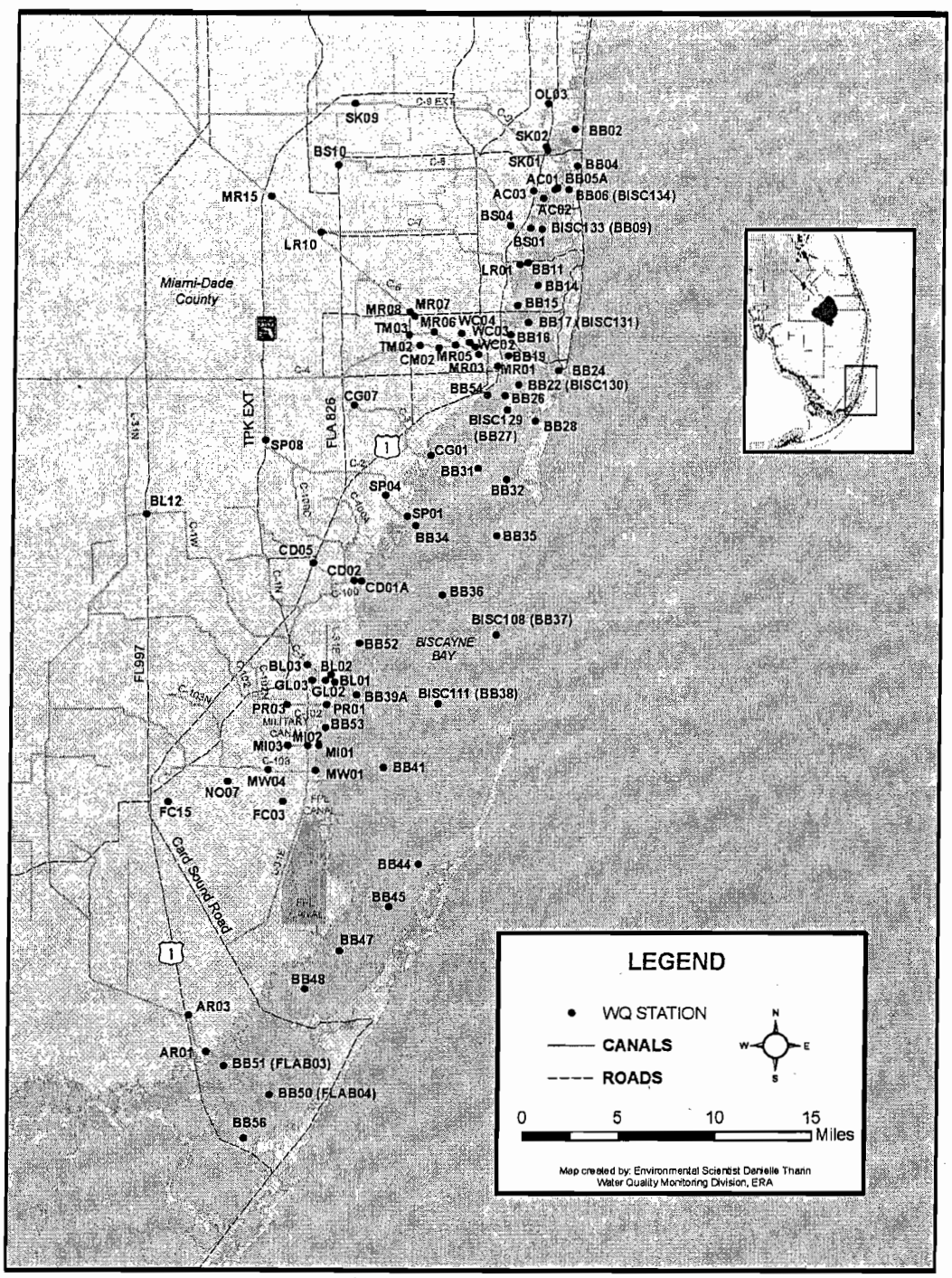

Figure 1- Biscayne Bay Surface Water Quality and Biological Monitoring Network

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Table 4- Surface Water Quality Monitoring Sites and GPS Coordinates

Site Name	GPS Latitude	GPS Longitude	Site Name	GPS Latitude	GPS Longitude	Site Name	GPS Latitude	GPS Longitude	Site Name	GPS Latitude	GPS Longitude
AC01	255402.419	800839.720	BB35	253838.698	801129.294	CD02	253640.27	801835.541	OL03	255749.343	800900.728
AC02	255338.358	800914.419	BB36	253559.939	801410.584	CD05	253725.870	802037.051	PR01	253110.52	801955.119
AC03	255359.546	800943.944	BISC108	253409	801133	CG01	254213.244	801446.941	PR03	253110.266	802150.565
AR01	251543.384	802543.384	BISC111	253057	801424	CG07	254427.79	801838.42	SK01	255546.097	800901.328
AR03	251720.446	802635.034	BB39A	253135.158	801825.408	CM02	254700.437	801424.611	SK02	255555.161	800908.328
BB02	255641.533	800739.964	BB41	252821.677	801704.112	FC03	252653	802203	SK09	255751.242	801839.926
BB04	255503.615	800732.766	BB44	252404.285	801519.349	FC15	252653.173	802739.251	SP01	253930.123	801557.363
BB05A	255406.198	800832.170	BB45	252210.529	801647.909	GL02.	253213.994	801958.913	SP04	254026.688	801702.662
BB06	255401.343	800756.879	BB47	252012.460	801912.276	GL03	253214.288	802037.549	TM02	254708.028	801521.402
BISC133	255200	800900	BB48	251830.942	802055.951	LR01	255042.629	801024.124	TM03	254736.190	801553.294
BB11	255047.311	801001.084	BB50	251347.632	802236.399	LR10	255210.403	802019.387	WC02	254703.519	801237.603
BB14	254948.274	800930.842	BB51	251505.385	802450.682	MI01	252921.698	802017.304	WC03	254715.554	801254.174
BB15	254854.273	801030.972	BB52	253352.593	801817.443	MI02	252921.698	802050.437	WC04	254739.924	801317.219
BB16	254736.152	801051.490	BB53	253009	801956	MI03	252922.053	802148.778			
BB17	254809.630	800957.493	BB54	254454.719	801159.356	MR01	254612.126	801129.434			
BB19	254640.713	801057.975	BB56	251151.536	802352.122	MR03	254643.359	801226.042			
BB22	254522.601	801027.371	BL01	253209.756	801930.976	MR05	254708.695	801335.966			
BB24	254559.675	800826.050	BL02	253228.272	801942.511	MR06	254743.499	801439.801			
BB26	254451.997	801106.255	BL03	253256.573	802053.293	MR07	254826.204	801536.638			
BISC129	254412	801106	BL12	253939.681	802850.212	MR08	254837.352	801551.384			
BB28	254345.040	800936.969	BS01	255219.466	800953.168	MR15	255345.531	802245.944			
BB31	254137.609	801227.249	BS04	255226.662	801053.289	MW01	252814.839	802026.4318			
BB32	254108.448	801100.847	BS10	255507.450	801928.183	MW04	252816.65	802245.384			
BB34	253905.335	801532.665	CD01A	253637.692	801823.744	NO07	252745.662	802443.807			

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Table 5 – Biscayne Bay Surface Water Quality Monitoring

TION	Physical	PAR	TP	NH3-N (filtered)	T NH3-N	NOx-N (filtered)	Color	turb	chl-a	Cu-FW	Pb-FW	Zn-FW	Cd-FW	TKN	O-TPO4 (filtered)	TSS	HRDNES	TOC
C01	M	M	M	M	M	M		M						B				
C02	M	M	M	M		M		M						B				
C03	M		M	M	M	M		M		SA	SA	SA	SA				SA	
R01	M	M	M	M		M	M	M	M					B				
R03	M		M	M		M		M	M	SA	SA	SA	SA	B			SA	
B02	M	M	M	M		M		M	M					M	M			M
B04	M	M	M	M		M	M	M	M					M	M			M
05A	M	M	M	M	M	M	M		M					M	M			M
B06 C134)	M	M	M	M	M	M	M	M	M					M	M			M
C 133 B09)	M	M	M	M		M		M	M					M	M			M
B11	M	M						M										
B14	M	M	M	M		M		M	M					M	M			M
B15	M	M						M										
B16	M	M						M										
C 131 B17)	M	M	M	M		M		M	M					M	M			M
B19	M	M						M										
B22 C130)	M	M	M	M		M	M	M	M					M	M			M
B24	M	M						M										
B26	M	M						M										
C129 B27)	M	M	M	M		M		M	M					M	M			M
B28	M	M						M										
B31	M	M	M	M		M		M	M					M	M			M
B32	M	M						M										
B34	M	M						M										

N

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TION	Physical	PAR	TP	NH3-N (filtered)	T NH3-N	NOx-N (filtered)	Color	turb	chl-a	Cu-FW	Pb-FW	Zn-FW	Cd-FW	TKN	O-TPO4 (filtered)	TSS	HRDNES	TOC
335	M	M	M	M		M		M	M					M	M			M
336	M	M	M	M		M	M	M	M					B				
C108 337)	M	M	M	M		M		M	M					M	M			M
C 111 338)	M	M	M	M		M		M	M					M	M			M
39A	M	M	M	M	M	M	M	M	M					M	M			M
341	M	M	M	M		M		M	M					M	M			M
344	M	M	M	M		M		M	M					M	M			M
345	M	M						M						B				
347	M	M	M	M		M		M	M					M	M			M
348	M	M						M										
350 AB04)	M	M	M	M		M	M	M	M					M	M			M
351 AB03)	M	M	M	M		M	M	M	M					M	M			M
352	M	M	M	M	M	M	M	M	M					M	M			M
353	M	M	M	M	M	M	M	M	M					M	M			M
354	M	M	M	M		M		M	M					M	M			M
356	M	M	M	M		M		M	M					M	M			M
L01	M	M	M	M	M	M		M						B				
L02	M	M	M	M	M	M	M	M						B				
L03	M		M	M	M	M		M		SA	SA	SA	SA	B	M	Q	SA	
L12	M		M	M		M	M	M		SA	SA	SA	SA	B	M	Q	SA	
S01	M	M	M	M		M		M						B				
S04	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
S10	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
001A	M	M	M	M		M		M	M					B				
D02	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
D05	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
G01	M	M	M	M		M		M						B				
G07	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	

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TION	Physical	PAR	TP	NH3-N (filtered)	T NH3-N	NOx-N (filtered)	Color	turb	chl-a	Cu-FW	Pb-FW	Zn-FW	Cd-FW	TKN	O-TPO4 (filtered)	TSS	HRDNES	TOC
I02	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
03	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
15	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
.02	M		M	M	M	M		M						B				
.03	M		M	M	M	M		M		SA	SA	SA	SA	B	M	Q	SA	
R01	M	M	M	M		M		M						B				
R10	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
I01	M	M	M	M		M		M	M					B				
I02	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
I03	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
R01	M	M	M	M	M	M		M						B				
R03	M	M	M	M	M	M		M						B				
R05	M	M	M	M		M		M										
R06	M	M	M	M	M	M		M										
R07	M	M	M	M		M		M						B				
R08	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
R15	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
V01	M	M	M	M		M		M						B				
V04	M		M	M		M	M	M		SA	SA	SA	SA	B	M	Q	SA	
O07	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
L03	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
R01	M	M	M	M		M		M						B				
R03	M		M	M		M	M	M		SA	SA	SA	SA	B	M	Q	SA	
K01	M	M	M	M		M		M						B				
K02	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
K09	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
P01	M	M	M	M		M	M	M	M					B				
P04	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	
M02	M	M	M	M		M		M						B				
M03	M		M	M		M		M		SA	SA	SA	SA	B	M	Q	SA	

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ION	Physical	PAR	TP	NH3-N (filtered)	T NH3-N	NOx-N (filtered)	Color	turb	chl-a	Cu-FW	Pb-FW	Zn-FW	Cd-FW	TKN	O-TPO4 (filtered)	TSS	HRDNES	TOC
02	M	M	M	M	M	M		M										
03	M		M	M	M	M		M										
04	M		M	M	M	M		M		SA	SA	SA	SA				SA	

M = MONTHLY: JAN - DEC; B = BIMONTHLY: JAN,MAR,MAY,JUL,SEP,NOV; Q = QUARTERLY: MAR,JUN,SEP,DEC; SA = SEMI-ANNUAL: JUNE, DEC; A = ANNUALLY: MAR

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Task 3 - Routine Epibenthic Habitat Monitoring

The primary objective of this program is to identify if spatial trends in vegetation across the study area are changing with time; thus the approach to analysis is based on the spatial and temporal trends.

The County shall conduct monitoring at established benthic stations (Table 6) and a rapid visual evaluation at 102 random sites in Biscayne Bay (Figure 2). Each established benthic site will be sampled annually during the month of June. Parameters will include: seagrass shoot density, standing crop biomass by species, and seagrass composition along a 150 foot transect. Shoot and blade density will be determined at each station by sampling a 0.2 m^2 section at each of three fixed one meter square grids. Standing crop biomass will be harvested from three 0.04 m^2 areas at each station. Biomass samples will be segregated by species, rinsed in a mild HCl solution, then dried in an oven at 60 °C and weighed to a constant weight. The location (latitude and longitude) of each sample point shall be determined and navigation to sample sites shall be accomplished using Global Positioning System (GPS). The latitudes and longitudes shall be transferred to Geographical Information System (GIS) based software.

In addition to the fixed sampling stations, the County shall use stratified random sampling in Biscayne Bay consisting of 102 stratified random sites sampled annually using the modified Braun-Blanquet cover-abundance scale (BBCA). The County shall estimate the overall cover for each species of seagrass and total cover for all species using the BBCA scale defined below.

SAV Sampling Techniques (Braun-Blanquet)

Appendix B specifically describes the Braun-Blanquet metrics necessary for District data requirements related to the estuaries' monitoring, restoration, and water management activities as well as for future use in model construction and calibration. The objective for outlining these metrics is to ensure uniform data collection and reporting by numerous investigators across several agencies contracted by the District. These metrics are designed to allow the investigator to emphasize scoring functional groups of different macrophyte taxa while diminishing the scoring of species which may result in inaccurate data due to the limitations of an investigator's command and familiarity of particular species, particularly with respect to red, green (calcareous and fleshy), and brown algae. These metrics may also allow for increased resolution of total macrophyte cover and functional group cover in order to better document and model the status and trends of benthic community composition and for ground truthing of remote sensing data.

The County shall participate in an annual inter-calibration exercise. The annual field exercise would bring representatives from all groups together for participation, thus helping to facilitate greater communication between groups. This exercise would be organized by the District for every spring and any questions/concerns about metrics/methods that have arisen during the previous year of sampling can be discussed.

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Task 3 Deliverable 1: Data collection

Due Date: Scan of Field documentation due Friday of the following week after last day of collection

Task 3 Deliverable 2: Biomass data

Due Date: June data shall be submitted by September 28th

Table 6--Epibenthic Monitoring Sites and GPS Coordinates

Site Name	GPS Latitude	GPS Longitude
BH06	255401.233	800756.279
BH10	255209.484	800843.021
BH14	254907.526	800941.261
BH22	254536.334	801038.634
BH29	254252.251	801239.588
BH31	253715.137	801216.803
BH34	253908.117	801535.01
BH35	253812.784	801023.033
BH36	253559.843	801410.579
BH37	253408.711	801139.897
BH39	253156.388	801818.192

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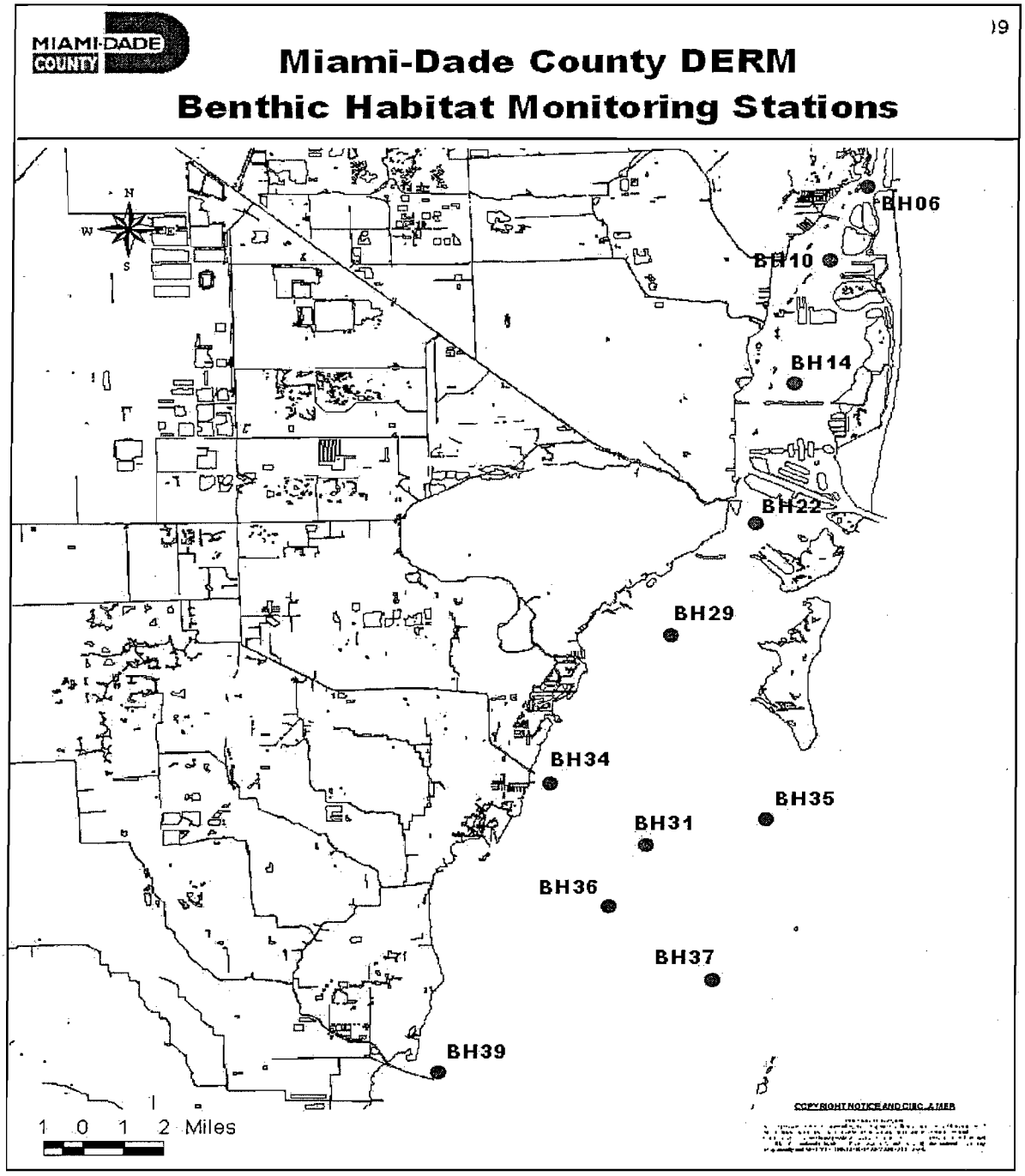

Figure 2- Benthic Habitat Monitoring Stations

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Task 4 - Data Management and Reporting

4.1 - Data Format for Deliverables

The County shall submit all data in the specific digital format shown in Appendix A. The County shall evaluate the data in accordance with the data quality objectives. All data submittals shall conform to existing District guidelines or other format as requested by the District. The County shall maintain an on-site electronic database of all data collected throughout the life of the project. For all sample matrices, the result data shall be submitted to the District project manager in both hard copy and electronic formats. The County shall continue the use of Automatic Data Processing Tool (ADaPT), which will be provided by the District. All Electronic Data Deliverables (EDD) shall be submitted to the District in ADaPT (See Appendix A).

The County shall submit quarterly reports which at a minimum shall include the following:

1) Electronic Data Deliverable for all chemistry lab data and field data in ADAPT format.
2) Chain of Custody Forms for water quality samples collected for laboratory analysis including: collection method and instrumentation (if collected via a sampler [i.e., Van Dorn, Niskin, Alpha bottles or peristaltic pump] include type and capacity of sampler); type and capacity of sample container used for each parameter of interest (i.e., acid-washed 60-ml HDPE [high density polyethylene] bottle); and for samples that were filtered, include filtration apparatus and manufacturer, and type (i.e., GF/F), pore size and size (diameter) of filter used.
3) Field Observations
4) Make and model of instrument used to collect field measurements.
   - The first report shall include the make and model of all instruments used on the project. Subsequent reports can refer to instrument numbers that have already been identified in the initial report if a sufficient instrument tracking system is implemented. In subsequent reports, the County shall also report the make and model number of new instrumentation used and instrumentation taken out of service.
5) Sample preservation and transport - Weather observations made during each monitoring event (i.e., air temperature, percent cloud cover, wind speed and direction, rainfall, tide, etc.).
6) Monitoring Problems
   - In narrative form, specify any monitoring problems that may have occurred during the course of the report period. Monitoring problems can be (and are not limited to) inclement weather (i.e., tropical storms and hurricanes), equipment failures, scheduling problems, etc.
7) A data validation statement

Task 4 Deliverable: Quarterly project status and data reports

Due date: October, November and December data shall be submitted by January 30th; January, February and March data shall be submitted by April 30th; April, May and June data shall be submitted by July 30th; July and August data shall be submitted by September 28th; and September data shall be submitted as an addendum to the Quarterly Report by October 30th.

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EXHIBIT "B"
PAYMENT AND DELIVERABLE SCHEDULE

A summary deliverable schedule for each task associated with this project is set forth below. The schedule is based on a five (5) year period.

The County hereby agrees to provide the District all deliverables, data and information described in the Statement of Work in both written and electronic four-digit format. Acceptability of all work shall be based on the judgment of the District that the work is technically credible, accurate, precise and timely.

The District shall review and forward, within fifteen (15) working days of receipt, recommended revisions (letter format) to each report for incorporation by the County into the final submission.

The County shall submit invoices in the not-to-exceed amounts listed in the schedule below. All invoices shall list the deliverables submitted to the District as set forth under Tasks 1 through 4 of this Cooperative Agreement. **The District may refuse payment for data that does not meet District/FDEP quality assurance/quality control criteria. Payment of invoices shall be contingent upon delivery and acceptance by the District of all deliverables and work products due within the invoiced period.**

Total payment by the District for all work completed herein shall not exceed the amount of One Million One Hundred Forty-eight Thousand Three Hundred Ninety-four Dollars and Sixty-seven Cents ($1,148,394.67). All payments are subject to District fiscal year appropriations, including $216,305.38 for FY10; $222,794.56 for FY11; $229,478.38 for FY12; $236,362.73 for FY13; and $243,453.62 for FY14.

If the total consideration for this Agreement is subject to multi-year funding allocations, funding for each applicable fiscal year of this Agreement will be subject to Governing Board budgetary appropriation. In the event the District does not approve funding for any subsequent fiscal year, this Agreement shall terminate upon expenditure of the current funding, notwithstanding other provisions in this Agreement to the contrary.

Task	Deliverable(s)	Due Date	FY10 Oct 1- Sept 30	FY11 Oct 1- Sept 30	FY12 Oct 1- Sept 30	FY13 Oct 1- Sept 30	FY14 Oct 1- Sept 30	TOTAL DISTRICT NOT-TO-EXCEED PAYMENT
1	Two (2) copies of the Quality Assurance Project Plan & Quality Manual	Submit to District Contract Manager within 1 month of Agreement Execution	0	0	0	0	0	
2	Sample Collection Laboratory Analyses	Frequencies noted in Table 5; scan of field documentation due Friday of the following week January 30th, April 30th, July 30th, September 28th (with addendum of the September's collection results by October 30th)	204,603.60 ($51,150.90/ QTR)	$210,741.72 ($52,685.43/ QTR)	$217,063.96 ($54,265.99/ QTR)	$223,575.88 ($55,893.97/ QTR)	$230,283.16 ($57,570.79/ QTR)	**$1,086,268.32**
3 (June)	Data Collection Biomass Data	Scan of field documentation due Friday of the following week after last day of collection June Data due September 28th	$11,701.78 (1QTR only)	$12,052.84 (1 QTR only)	$12,414.42 (1 QTR only)	$12,786.85 (1 QTR only)	$13,170.46 (1 QTR only)	**$62,126.35**
4	Quarterly Project Status Reports, Data Reports, & Financial Reports	January 30th, April 30th, July 30th, September 28th (with addendum of the September's collection results by October 30th)	0	0	0	0	0	
Total District Payment Not to Exceed			$216,305.38	$222,794.56	$229,478.38	$236,362.73	$243,453.62	**$1,148,394.67**

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EXHIBIT C

FUNDS AWARDED TO THE ENTITY PURSUANT TO THIS AGREEMENT CONSIST OF THE FOLLOWING:

Federal Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following:

Federal Program Number	Federal Agency	CFDA Number	CFDA Title	Funding Amount	State Appropriation Category

State Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following Matching Resources for Federal Programs:

Federal Program Number	Federal Agency	CFDA Number	CFDA Title	Funding Amount	State Appropriation Category

State Resources Awarded to the Recipient Pursuant to this Agreement Consist of the Following Resources Subject to Section 215.97, F.S.:

Federal Program Number	Federal Agency	State Fiscal Year	Number	CSFA Title Or Funding Source Description	Funding Amount	State Appropriation Category
	Department of Environmental Protection		37.039	Water Protection & Sustainability Trust Fund	$1,148,394.67	

Total Award	$1,148,394.67	

For each program identified above, the recipient shall comply with the program requirements described in the Catalog of Federal Domestic Assistance (CFDA) [http://12.46.245.173/cfda/cfda.html] and/or the Florida Catalog of State Financial Assistance (CSFA) [http://state.fl.us/fsaa/catalog]. The services/purposes for which the funds are to be used are included in the Contract scope of services/work. Any match required by the recipient is clearly indicated in the Contract.

Appendix A

STANDARD ADaPT ELECTRONIC DATA DELIVERABLE

1.0 INTRODUCTION AND BACKGROUND

The South Florida Water Management District (District) and the Florida Department of Environmental Protection's Bureau of Laboratories (FDEP) jointly acquired technical services from a consultant to develop and customize an electronic data deliverable (EDD) review and validation tool program known as the Automated Data Processing Tool (ADaPT). This tool will aid in processing analytical data, validating format and completeness, checking the data quality and compliance with the method and data quality objectives for all analytical data submitted to the District. The consultant selected for the development of ADaPT is Laboratory Data Consultants FL, Inc. located at 112 Kings Way, Royal Palm Beach, FL 33411. Respondents may contact Julio Paredes at (561) 753-0483 for additional information.

2.0 OBJECTIVE

The District requires the County to utilize the ADaPT software to perform its own automated data review soon after analysis is complete. ADaPT is a Microsoft ACCESS based application tool. The laboratory version reads the EDD, checks it against the EDD specifications and against an electronic Quality Assurance Project Plan library for errors. If any error is found it allows and facilitates its correction. After all errors are corrected, it allows for the EDD to be exported as a .txt or .csv file to be delivered to the District QA/Contract Manager.

3.0 WORK BREAKDOWN STRUCTURE

Copies of the validation tools software (ADaPT) will be provided to the County upon request. Data for analysis conducted by the County shall be provided to the District in hard copy reports and as EDDs following the format guidelines in Table 1A and 1B. The District's EDDs requirements are described in the following tasks.

3.1 - Lab Receipt Deliverable

Upon receipt of samples, the County shall generate a lab receipt file for delivery to the District's QA unit within a day of sample receipt. The lab receipt file format will be verified ADaPT. The Contractor shall email the verified version of the receipt file generated by the ADaPT software to a pre-determined list of District staff which will include the District's Project Manager. The file naming convention should be "A" + Contractor FDOH ID + Date (YYYYMMDD) generated + sequence e.g. A-E12121-20011201-1. The District will provide the Contractor with a list of recipients for this email notification before samples are received. The deliverable elements are listed in Table 1A.

3.2 - Lab Results Deliverable

The County shall perform analysis and provide results in the format outlined in Table 1B. The EDD file is verified by the County for format and project requirements using ADaPT. The County shall correct errors or inconsistencies found by ADaPT. Any unresolved issues are documented through the ADaPT tool. The County shall email the verified version of the EDD generated by ADaPT to a pre-determined list of District staff which will include the District's Project Manager. The file naming convention should be "R" + DERM FDOH ID + Date (YYYYMMDD) generated + sequence e.g. R-E12121-20011201-1.The District will provide the County with a list of recipients for this email notification.

The EDD will include data for samples submitted to the County as well as laboratory quality control samples for method blanks, laboratory control samples, matrix spikes, matrix spike duplicates or duplicate samples.

3.3 - Project Library

An electronic project library shall be generated by the County to document project specific requirements. The library is created using ADaPT. The District Project Manager will review and approve electronic project library prior to it use. This library will be used by the County and District staff during the EDD error check and data validation process. Any changes in laboratory protocols that affect the project library need to be communicated to the District and once approved incorporated in the project library.

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Table 1A Data Element Name	Data Type	Description	Required?	SVL*	Error Check
Location_Code	Text(80)	Location where the sample was taken	Yes	Yes	• Not Null if for SFWMD • Length ≤ 80 • SVL check against ADaPT standard values for Location_Code if EDD is reported for SFWMD
Project_Number	Text(30)	Number assigned by the client to associate a sample to a project, purchase order, or requisition	Yes	Yes	• Length ≤ 30 • SVL check against ADaPT standard values for Project Number
Lab_ID	Text(7)	Identification of the laboratory performing the analysis. Use the DOH certification number if possible	Yes	Yes	• Not Null • Length ≤ 7 • SVL check against ADaPT standard values for Lab_ID
Client_Sample_ID	Text(35)	Client's identifier for a sample.	Yes	No	• Not null • Length ≤ 35 • One distinct ClientSampleID for a given LabSampleID
End_Date_Collected	Date/Time	The date and time of sample collection. Format as: MM/DD/YYYY hh:mm where MM = two digit month, DD = two digit date, YYYY = four digit year, hh = two digit hour, and mm = two digit minutes	Yes	No	1.0 Not null 2.0 Valid date/time value 3.0 Correctly formatted as MM/DD/YYYY hh:mm 3.1 Logical (does not supersede Lab_Receipt_Date)
Sampling_Personnel	Text(40)	Person collecting sample	Yes	No	• Not null • Length ≤ 40
Collection_Agency	Text(20)	Agency collecting sample	Conditional	Yes	• Length ≤ 20 • Not null for SFWMD • SVL check against ADaPT standard values for Collection_Agency if EDD is reported for SFWMD
Lab_Receipt_Date	Date/Time	Date and time sample received by the laboratory. . Format as: MM/DD/YYYY hh:mm where MM = two digit month, DD = two digit date,	Yes	No	• Not null • Valid date/time value • Correctly formatted as MM/DD/YYYY hh:mm

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Table 1A Data Element Name	Data Type	Description	Required?	SVL*	Error Check
		YYYY = four digit year, hh = two digit hour, and mm = two digit minutes			• Logical (does not precede End_Collection_Date)
Matrix_ID	Text(20)	The sample matrix for the reported analyte	Yes	Yes	• Not null • Length ≤ 20 • SVL check against ADaPT standard values for Matrix_ID
Lab_Sample_ID	Text(50)	Laboratory tracking number for field samples and laboratory generated QC samples	Yes	No	• Not null • Length ≤ 50 • One distinct LabSampleID for a given ClientSampleID
Lab_Analysis_Ref_Method_ID	Text(80)	The laboratory reference method ID. These should be specified by Florida DEP and entered into the project specific library	Yes	Yes	• Not null • Length ≤ 80 • SVL check against ADaPT standard values
Preservation_Intact	Text(3)	Indicates if the sample was preserved properly based on measurement at the time of sample receipt at the laboratory. This applies to each bottle collected	Yes	Yes	• Not null • Length ≤ 3 • Reported as "Yes" or "No"
Custody_Intact_Seal	Text(3)	Indication of whether the custody seal was intact if custody seals were used. Enter "NO" only for those containers with seals that have been broken, and "YES" for containers with intact seals or no seals used.	Yes	Yes	• Not null • Length ≤ 3 • Reported as "Yes", "No", or "N/A"
Receipt_Comments	Text(255)	Information related to the samples received by the laboratory that is not captured in other fields	No	No	• Not null if Preservation Intact or Custody_Intact_Seal = "No" • Length ≤ 255

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Shipping_Batch_ID	Text(25)	Unique identifier assigned to a cooler or shipping container, or group of coolers or shipping containers that links samples together. The Shipping_Batch_ID is provided by the client on the chain of custody.	Yes	No	• Length ≤ 25
Lab_Reporting_Batch_ID	Text(13)	Laboratory identifier for a group of samples and laboratory QC all reported within on EDD or batch. The Lab_Reporting_Batch_ID is equivalent to the sample delivery group, lab work number, log-in ID, etc.	Yes	No	• Not null • Length ≤ 13
Program_Type	Text (20)	Type of program, e.g., experimental or monitoring	Conditional	Yes	• SVL (Either MON or EXP) • Not Null
Sample_Collection_Type	Text (SVL)	Sample collection type (grab, composite, etc)	Conditional	Yes	• SVL of collection methods • Not Null
Sample_Depth	Text (15)	Sample Collection Depth	Conditional	No	• Double ≤ 15 • Check for positive number.

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Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
Client_Sample_ID	Text(35)	Client's identifier for a sample. If a sample is analyzed as a duplicate, matrix spike, or matrix spike duplicate, append suffixes "DUP", "MS", and "MSD" respectively. For Lab QC samples such as blanks and LCS enter the LabSampleID in this field.	Yes	No	• Not null • Length ≤ 35 • Correct naming convention for Lab Duplicates, MS, and MSD samples
Lab_Analysis_Ref_Method_ID	Text(80)	The laboratory reference method ID. Standard values for methods are specified by Florida DEP and SFWMD.	Yes	Yes	• Not null • Length ≤ 80 • SVL check against project library
Lab_Sample_ID	Text(35)	Laboratory tracking number for field samples and laboratory generated QC samples	Yes	No	• Not null • Length ≤ 35
LabID	Text(7)	Identification of the laboratory performing the analysis. Use DOH certification number if possible	Yes	Yes	• Not null • Length ≤ 7 • SVL check against ADaPT standard value list
Client_Analyte_ID	Text(30)	Unique identifier for an analyte name. This is typically the CAS number, NELAC number, or Florida specified ID number	Yes	Yes	• Not null • Length ≤ 30 • SVL check against ClientAnalyteIDs entered in the project library • Completeness (in the project target analyte list for the method and matrix or reported as a spike or surrogate for the method and matrix as applicable)
Analyte_Name	Text(60)	The chemical name for the analyte. Values for Analyte Names are specified by Florida DEP and SFWMD.	Yes	Yes	• Not null • Length ≤ 60 • SVL check against Analyte Names

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Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
					entered in the project library for a method and matrix • Spikes reported in EDD for LCS and MS/MSD match project library for method and matrix • For organics, correct surrogates are reported according to the method requirements established in the project library
Result	Number (10)	Reported result for the analyte	Yes	No	• Not null • Length ≤ 10 • Numeric except for microbiologicals, which may be text; and REDOX, which may be negative • Result = MDL if Lab_Qualifiers contains "U"
Error	Text (10)	The two sigma error for radiochemistry results. Do not enter the "+" or "-" character in this field	Conditional	No	• Not null for radiochemistry result, spike, and tracer or carrier records • Numeric • Length ≤ 10
Result_Units	Text (10)	Units for the result	Yes	Yes	• Not null • Length ≤ 10 • SVL check against the units entered in project library for the method, matrix, and analyte
Lab_Qualifiers	Text (7)	A string of single letter result qualifiers assigned by the laboratory. Always use	Conditional	Yes	• Not null according to conditions listed at the end of this table

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Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
		the "U" qualifier for non-detects. Other qualifiers may apply. Order is insignificant.			• Length ≤ 7 • SVL check against ADaPT standard values for lab qualifiers • Consistency check (see list at end of this table)
Detection_Limit	Number (10)	Method detection limit for the measure analyte	Yes	No	• Not null unless target analyte is on exception list or Analyte_Type = "SURR" • Length ≤ 10 • Numeric • Less than or equal to the Reporting Limit • Not zero or negative
Analyte_Type	Text (7)	Defines the type of result such as surrogate, spike, or target compound.	Yes	Yes	• Not null • Length ≤ 7 • SVL check against the ADaPT standard values for Analyte_Type
Dilution	Number (10)	Overall dilution of the sample aliquot. A value of one (1) corresponds to nominal method conditions. Insert value of one (1) for method blanks, LCS, and LCSD.	Yes	No	• Not null • Length ≤ 10 • Numeric
Percent_Moisture	Number (10)	Percent of sample composed of water. Enter value for soil and sediments sample only.	Conditional	No	• Not null if matrix is a soil or sediment • Length ≤ 10 • Numeric
Percent_Recovery	Text (5)	Percent recovery value of a spiked or surrogate compound. If sample dilution yields no or very low recovery enter "DIL". If sample matrix interference yields no recovery, enter "INT". If the spike or	Conditional	No	• Not null if AnalyteType = "SURR", "SPK", or "TRACER" • Length ≤ 5 • Numeric or "DIL", "INT", or "NS"

Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
		surrogate was not added to a sample with Analyte_Type = "SPK" or "SURR"enter "NS".			
Relative_Percent_Difference	Number (5)	Relative percent difference between two QC results	Conditional	No	• Not null if AnalyteType = "SPK" and QCType = "LCSD" or "MSD"; or Not null if QCType = "DUP • Length ≤ 5 • Numeric
Reporting_Limit	Text (10)	Practical quantitation limit for the measured analyte. Also used as the reporting limit	Conditional	No	• Not null if AnalyteType = "TRG" or "SPK" • Length ≤ 10 • Numeric • Not zero or negative
Project_Number	Text (30)	Number assigned by the client to associate a sample to a project, purchase order, or requisition	Yes	Yes	• Length ≤ 30 • SVL check against ADaPT standard values for Project Number if entered.
Project_Name	Text (90)	Project name assigned by the client	Yes	Yes	• Length ≤ 90 • Check against ADaPT standard values for Project Name if entered.
End_Date_Collected	Date/Time	The date and time of sample collection. Format as: MM/DD/YYYY hh:mm where MM = two digit month, DD = two digit date, YYYY = four digit year, hh = two digit hour, and mm = two digit minutes	Conditional	No	• Not null if QCType = "N", "DUP", "MS", or "MSD" • Valid date/time value • Correctly formatted as MM/DD/YYYY hh:mm • Logical (does not supersede sample preparation and/or sample analysis date/time value)

Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
Matrix_ID	Text (20)	The sample matrix for the reported analyte. The standard values for Matrix_ID are specified by the State of Florida	Yes	Yes	• Not null • Length ≤ 20 • SVL check against ADaPT standard values for Matrix_ID
QC_Type	Text (7)	Identifies the type of sample (i.e. method blank, LCS, LCSD, laboratory duplicate, MS, MSD, or normal field sample. For normal field samples enter "N".	Yes	Yes	• Not null • Length ≤ 7 • SVL check against ADaPT standard values for QC_Type
Shipping_Batch_ID	Text (25)	Unique identifier assigned to a cooler or shipping container or group of coolers or shipping containers that links samples together. The Shipping_Batch_ID is provided by the client on the chain of custody.	Conditional	No	• Required if QC_Type = N, DUP, MS, or MSD • Length ≤ 25
Temperature	Number (10)	Temperature in degrees C of the sample as received by the lab.	No	No	• Numeric, if reported • Length ≤ 10 if reported
Preparation_Type	Text (25)	The method used to prepare the sample. For methods that do not have a preparation method as part of the analysis enter "No Prep".	Yes	Yes	• Not null • Length ≤ 25 • SVL check against ADaPT standard values for Preparation_Type
Analysis_Type	Text (10)	Indicates the type of analysis (i.e. dilutions, re-analyses or re-extracts). This field provides distinction among records when multiple analyses are submitted for the same sample and method. Enter RES for the initial analysis.	Yes	Yes	• Not null • Length ≤10 • SVL check against ADaPT standard values for Analysis_Type
Reportable_Result	Text (3)	Indication of whether or not the laboratory	Conditional	Yes	• Not null if AnalyteType = "TRG"

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Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
		chooses an individual analyte result as reportable. Enter "YES" if the result is reportable. Enter "NO" if the result not.			• Length ≤ 3 if reported • Value = "YES" or "NO" • Duplicate "YES" for a given Client_Sample_ID, Method, Matrix, Client_Analyte_ID, and Total_Or_Dissolved value
Date_Prepared	Date/Time	The date and time of sample preparation or extraction. Format as: MM/DD/YYYY hh:mm where MM = two digit month, DD = two digit date, YYYY = four digit year, hh = two digit hour, and mm = two digit minutes. For analyses with no preparation, insert the analysis date.	Yes	No	• Not null • Valid date/time value • Correctly formatted as MM/DD/YYYY hh:mm • Logical (Date_Prepared does not precede Date_Collected and supersede Date_Analyzed)
Date_Analyzed	Date/Time	The date and time of sample analysis. Format as: MM/DD/YYYY hh:mm where MM = two digit month, DD = two digit date, YYYY = four digit year, hh = two digit hour, and mm = two digit minutes.	Yes	No	• Not null • Valid date/time value • Correctly formatted as MM/DD/YYYY hh:mm • Logical (Date_Analyzed does not precede Date_Collected and/or Date_Prepared)
Total_Or_Dissolved	Text (3)	Indicates if the result is reported on a total or dissolved sample fraction. Report only for aqueous results	Yes	Yes	• Not null • Reported as "TOT" or "DIS" for water matrices and "N/A" for non-water matrices • Length ≤ 3
Prep_Batch_ID	Text (13)	Unique laboratory identifier for a batch of samples of similar matrix prepared together for analysis by one method and treated as a group for method blank, LCS,	Yes	No	• Not null • Length ≤13 • Each distinct Prep_Batch_ID for a method and matrix has records for

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Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
		and LCSD association. The Prep_Batch_ID links method blanks and laboratory control samples (LCS/LCSD) to associated samples.			the same method and matrix where QCType = "MB" and "LCS" • Each distinct Prep_Batch_ID for a method and matrix for each MB and LCS contains one or more sample records with the same method, matrix, and Prep_Batch_ID.
Method_Batch_ID	Text (13)	Unique laboratory identifier for a batch of samples of similar matrix analyzed by one method and treated as a group for laboratory duplicate, matrix spike, and matrix spike duplicate association. The Method_Batch_ID links laboratory duplicates, matrix spikes, and matrix spike duplicates to associated samples.	Yes	No	• Not null • Length ≤ 13 • For non-metal inorganic methods, each distinct Method_Batch_ID for a method and matrix has records reported where QCType = MS and DUP • For metals each distinct Method_Batch_ID for a method and matrix has records reported where QCType = "MS" and "MSD" or QCType = "MS" and "DUP" • For organic methods each distinct Method_Batch_ID for a method and matrix has records where QCType = "MS" and "MSD" • Each Method_Batch_ID for a method and matrix has sample records with the same method, matrix and Method_Batch_ID
Preservation_Intact	Text (3)	Indicates if the sample was preserved properly based on measurement at the time of sample receipt at the laboratory. This applies to each bottle collected	Yes	Yes	• Not null • Length ≤ 3 • Reported as "Yes" or "No" • Preservation_Intact = "No" if Lab_Qualifiers contains "Y"

Table 1B Data Element Name	Data Type	Description	Required	SVL*	Error Check
QC_Spike_Added	Number (5)	Value of spike or surrogate compound entered as a numeric character	Conditional	No	• Length ≤ 5 if reported • Required for SFWMD
Result_Comments	Text (255)	Free-form text where data provider relates information they consider relevant to the sample that is not included in the above fields.	Conditional	No	• Not null for certain constraints • Length ≤ 255
Lab_Reporting_Batch_ID	Text (13)	Laboratory identifier for a group of samples and laboratory QC all reported within one EDD or batch. The Lab_Reporting_Batch_ID is equivalent to the sample delivery group, lab work number, login ID, etc.	Yes	No	• Not null • Length ≤ 13 • The same value is reported in all records within the EDD

Appendix B

Braun-Blanquet Technique

Braun-Blanquet Cover Abundance Index Intervals

Working definition of BBCA intervals:

0.1	=	<5% cover with a solitary individual/shoot
0.5	=	<5% cover with a few individuals/shoots (sparse)
1	=	<5% cover with numerous individuals/shoots (numerous)
2	=	≥ 5% cover and ≤25% cover
3	=	>25% cover and ≤50% cover
4	=	>50% cover and ≤75% cover
5	=	>75% cover

An important consideration for the BBCA scale is solitary individuals with large cover. If the total cover of the individual is less than 5% then the score should be 0.1, but if the cover is greater than or equal to 5% then the score should be whichever score represents the cover amount (2 through 5). Similarly, if a single individual occupies less than 5% but appears large, the score is still 0.1. This is applicable to "sparse" (0.5) and "numerous" (1) individuals as well. In summary, if the cover is less than 5%, the abundance (not the cover) determines the score, but if the cover is 5% or greater, then only cover should be considered.

Biological parameters metrics

Braun-Blanquet metrics and methods inter-calibration

Core Totals metrics:

TOT= Total benthic macrophyte cover – includes drift reds (DR) but excludes animals or other non-submerged aquatic vegetation constituents (e.g. mangrove prop roots/seedlings, benthic mat algae).

TDR = Total drift red algae – after scoring, DR should be removed from quadrant sample area, taking care to not disturb the underlying macrohyte position and profile. For defining purposes, DR is any algae that is **not attached to the substrate and/or is free-living**. Epiphytic algae **should not** be counted as drift.

T-DR = Total benthic macrophyte cover after DR removal – excludes animals and other benthic constituents.

TSG = Total seagrass cover

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TMA = Total macroalgae cover – includes calcareous green algae, freshly green algae, red algae (fleshy and coralline), and brown algae. **Excludes DR and epiphytic algae.**

TCAL = Total calcareous green algae - includes Penicillus, Halimeda, Udotea, Rhipocephalus, Acetabularia, and Neomaris (rare species that is not included on B8 sheet).

TGO = Total green other algae - includes Caulerpa, Batophora, Dasycladus, Avrainvilla, Chara, etc.

TRO = Total red other algae - includes Laurencia, coralline reds, etc. **Excludes DR and epiphytic algae.**

TBR = Total brown algae - includes Dictyota, Sargassum, etc.

Seagrass, algae, and rare species metrics:

TT = Thalassia testudinum - receives a score when present.

HW = Halodule wrightii – receives score when present

SF = Syringodium filiforme – receives score when present

HD = Halophila decipiens - receives a score when present.

HE = Halophila engelmanii - receives a score when present

HJ = Halophila johnsonii - receives a score when present.

RM = Ruppia maritima - receives a score when present.

PEN = Penicillus spp. - presence/absence noted

RHI = Rhipocephalus spp. - presence/absence noted

HAL = Halimeda spp. presence/absence noted

UDO = Udotea spp. - presence/absence noted

ACE = Acetabularia spp. - presence/absence noted

BAT = Batophora - presence/absence noted. NOTE: may also be used interchangeably and/or in conjunction with to denote Dasycladus as well.

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CA = Caulerpa spp. - presence/absence noted. NOTE: all pooled species present to be scored as a total.

ANA = Anadyomene spp. - presence/absence noted.

COR = Hard and soft coral species - pooled species (hard and soft) total will be scored when present. **NOTE:** corals are **not included** in total benthic macrophyte cover.

SP = Sponge species - pooled species total will be scored when present. **NOTE:** sponges are **not included** in total benthic macrophyte cover.

Considerations for Taking BBCA estimates:

- Do not manipulate macrophytes after throwing sample quadrant. The area of scoring interest lies within the sample quadrant as viewed from directly above. Therefore, macrophytes that are in contact with quadrant edges should be scored according to how they occlude the bottom (bent, compacted, or, otherwise) in the scoring area. Do not adjust macrophytes on quadrant edges for their inclusion or exclusion. Similarly any short shoots that hang over the quadrant and are in the scoring area should be scored accordingly.

- Quadrant design and construction: The construction of the quadrants may cause visual and/or scoring bias. The County Shall utilize 3/4" PVC quadrants with the "T" joints on the corners would be more appropriate for sampling because this appears to impact the benthic community less (bending and compaction), cause less glare and are lighter and easier to throw. There should be no strings crossing the quadrant used for scoring as this can cause compaction of the vegetation and possibly increase the total cover estimate. The interior dimensions of the sample quadrant should measure 50 cm on each side (total interior area = 0.25 m^2).

- When estimating BBCA scores, the County should focus on the scoring area that is not covered (bare sediment) versus the area that is covered because macrophyte morphology (vertical profile and abundance) can cause visual bias leading the observer to increase the total estimate of cover.

- Short shoot counts should never be taken before the BB score. This can cause a bias in the mind of the observer, especially when plants are numerous but have little cover (e.g. *Halodule).*

- Benthic microbial mats are not to be included in total macrophyte cover estimates and are otherwise not scored in any way.

- Detritus, it should be removed if it is obscuring the view of macrophytes in a way that could impact scoring ability. However, it may not be possible to remove it

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without impacting macrophyte profile or visibility (sediment resuspension) in some locations, so observers should use their own judgment and caution.

Field and Data Management QA/QC Considerations

Daily team field QA/QC: Each group's investigators should make an effort to score a common quadrant at a site at least once a day. This common quadrant should be previously assigned to one investigator for data reporting purposes (i.e. two sets of data are not reported for one quadrant) and another investigator for QC reporting. Following BBCA scoring, investigators should compare and discuss their scoring on the boat in order to facilitate better accuracy and precision amongst team members; however there should be **no changes** made to the data sheets arising from discussion and comparison. All QA/QC data should be submitted in a **separate spreadsheet** to the SFWMD for archiving purposes, with all site and quadrant specifications included. This will provide a record of intra-agency performance to be used to evaluate trends in scoring drift among investigators. In theory, any demonstrable scoring differences may be higher at the beginning of the field season, and any drift should be able to be corrected relatively quickly.

Data entry and reporting: Field data entered into a spreadsheet should be initialized and dated by the technician. Data entry needs to be QA/QC'd by two people – one checking the field data sheet, the other checking the data spreadsheet simultaneously. This will help to eliminate any reporting errors, typos, or omissions from the field sheet to the master spreadsheet. Additionally, the QA/QC procedure needs to be initialized and dated y both technicians. Any corrections or changes made on a data sheet should be recorded by a single line-strike (not erasing) and initialed and dated by the person making the change. The figure below shows the field data sheet that will be used for this effort

TOT Total Macrophytes TDR Total Drift Red T-DR Total Macrophytes-Drift Red TSG Total Seagrass TMA Total Macroalgae TCALT
Calcareous TGO Total Green Other (fleshy) TRO Total Red Other TBR Total Brown

Seagrass Species: TT Thalassia HW Halodule SF Syringodium HD H.decipiens HE H.engelmanii HJ H.johnsonii RM Ruppia
Species: COR Hard/soft coral SP Sponges

Calcareous Algae Species: PENicillus RHIpocephalus HALimeda UDOlda ACElabularia Fleshy Green Algae Species: E
Batophora/Dasycladus ANA Anadyomene CH Chara

0.1 = <5% solitary 0.5 = <5% sparse 1 = <5% numerous 2 = cover ≥5% - ≤25% 3 = cover >25% - ≤50% 4 = cover >50 - ≤75% 5 =

STN	Quad		TOT	TDR	T-DR	TSG	TMA	TCAL	TGO	TRO	TBR	TT	HW	SF	HD	HE	HJ	RM	PEN	RHI	HAL	UDO	ACE	BAT	ANA	CH	COR	SP	Comm
STN	Quad		TOT	TDR	T-DR	TSG	TMA	TCAL	TGO	TRO	TBR	TT	HW	SF	HD	HE	HJ	RM	PEN	RHI	HAL	UDO	ACE	BAT	ANA	CH	COR	SP	Comment

Figure 1 – Data Sheet 50

Corrections and Flagging Form Procedures

A list of commonly used qualifier codes is presented in Table 1 of the Florida Administrative Code (F.A.C.) 62-160 (FDEP QA Rule). Any additional questions and problems associated with the data shall be addressed through documentation. Documentation may include electronic mail, hand written notes, typed letters, or some form that may be printed or associated directly with the hard copy analytical report.

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Appendix C

EXAMPLE CALCULATIONS FOR SAV SURVEYS

All SAV results are to be reported as the mean of replicate sample dry weight biomass determinations.

Percent Collection Efficiency (% CE)

The % CE is determined as outlined in Section 7.3.2 and calculated as follows:

$$\%CE = {}^{TC - SC}/_{TC} x100$$

Where:

TC = Biomass of original sample collection and biomass of subsequent resampling

SC = Biomass of subsequent resampling

Sample Processing Efficiency (% SE)

An evaluation of a technician's sample processing efficiency is performed as outlined in Section 7.3.5 with % SE calculated as follows:

$$\%SE = {}^{TB - QCB}/_{TB} x100$$

Where:

TB = Biomass of original sample and biomass of SAV recovered from leavings

QCB = Biomass of SAV recovered from leavings

Constant Dry Weight Determination for Biomass

SAV samples are dried to constant weight as outlined in Section 7.3.3 with relative percent difference (RPD) between weighing values calculated as follows:

$$RPD = {}^{|Value_1 - Value_2|}/_{Average\ Value_1 \& Value_2} x100$$

Where:

$Value_1$ = First mass in grams

$Value_2$ = Subsequent mass in grams

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