St. Johns River
Water Management District
Ann B. Shortelle, Ph.D., Executive Director

525 Community College Parkway S.E. • Palm Bay, FL 32909 • 321-984-4940
On the internet at www.sjrwmd.com.

DATE: December 5, 2019

TO: Prospective Respondents

FROM: Amy Lucey, Contracts Administrator

SUBJECT: Addendum #3 to Request for Proposals # 35238, Remote Sensing and Mapping of Plant Communities for the Preservation of Natural Systems.

As a result of inquiries, the following clarifications/changes are provided for your information. Please make all appropriate changes to your proposal documents.

Q1: Can I please get a copy of contract(s) that have previously been awarded for mapping and classification project(s)?

A1: The last two contracts awarded are attached.

NOTE: The Proposal Opening remains 2:00 p.m. Tuesday, December 17, 2019.

Attachments:
Contract 28885
Contract 28099

Contract 28885
Encumbrance S008970

ENGINEERING SERVICES AGREEMENT
BETWEEN THE
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
AND
DEWBERRY CONSULTANTS LLC

THIS AGREEMENT is entered into by and between the GOVERNING BOARD of the ST. JOHNS RIVER WATER MANAGEMENT DISTRICT ("the District"), whose address is 4049 Reid Street, Palatka, Florida 32177, and DEWBERRY CONSULTANTS LLC ("Consultant"), whose address is 1000 N. Ashley Drive, Suite 801, Tampa, Florida 33602-3718. All references to the parties hereto include the parties, their officers, employees, agents, successors, and assigns.

In consideration of the payments hereinafter specified, Consultant agrees to furnish and deliver all materials and perform all labor required for Documentation of Vegetation Communities in the Lake Apopka and Upper Ocklawaha River Basins in 2016-2017 ("the Work"). In accordance with RFQ Number 28885, Consultant shall complete the Work in conformity with this Agreement, which consists of and incorporates all of the following documents: (1) advertisement for bids, proposals, or qualifications; (2) Instructions to Respondents; (4) addenda; certifications, and affidavits; (4) bid, proposal, or qualifications submittals; (5) Agreement, including the Statement of Work, and any Special Conditions or other attachments. If any provision in the body of this Agreement conflicts with any attachment hereto, the body of this Agreement shall prevail. This Agreement, including attachments, shall take precedence over all solicitation documents (items 1 - 4). The parties hereby agree to the following terms and conditions.

1. **TERM OF AGREEMENT**

(a) The term of this Agreement shall be from the Effective Date to the Completion Date. Time is of the essence for each and every aspect of this Agreement. Where additional time is allowed to complete the Work, the new time limit shall also be of the essence. Notwithstanding specific mention that certain provisions survive termination or expiration of this Agreement, all provisions of this Agreement that by their nature extend beyond the Completion Date survive termination or expiration hereof.

(b) **Effective Date.** The Effective Date is the date upon which the last party to this Agreement has dated and executed the same.

(c) **Completion Date**. The Completion Date of this Agreement is September 30, 2018, unless extended by mutual written agreement of the parties. The Work shall be completed for use no later than said date.

2. **COMMENCEMENT OF WORK.**

(a) Consultant shall commence the Work:

[X] Within fifteen (15) days after the Effective Date; or

[ ] Upon the issuance of a Notice to Proceed by the District; or

[ ] Within fourteen (14) days of issuance of a Work Order by the District; or

[ ] On _____ (insert specific date).

This date shall be known as the "Commencement Date." Consultant shall prosecute the Work regularly, diligently, and uninterruptedly so as to complete the Work ready for use in accordance with the Statement of Work and the time for completion stated therein. Consultant shall not commence the Work until any required submittals are received and approved.

3. **DELIVERABLES.**

(a) The Work is specified in the Statement of Work, Attachment A. Consultant shall deliver all products and deliverables as stated therein, and shall correct errors or omissions without additional compensation. In addition to hard copies, all written deliverables (reports, papers, analyses, etc.) shall be submitted in machine readable form in formats consistent with the District's standard software products, which include the Microsoft® Office Suite (Word, Excel, Access, and PowerPoint). Other formats may be accepted if approved by the District's Project Manager. If the Statement of Work does not include assistance in litigation undertaken or defended by the District, Consultant agrees to testify and assist the District in any such litigation that is dependent upon or related to the Work, except suits or claims between the parties, at the hourly rate provided in the Statement of Work. This obligation shall survive termination or expiration of this Agreement.

(b) Consultant is responsible for the professional quality, technical accuracy, and timely completion of the Work. Both workmanship and materials shall be of good quality. Consultant shall, if required, furnish satisfactory evidence as to the kind and quality of materials provided. Unless otherwise specifically provided for herein, Consultant shall provide and pay for all materials, labor, and other facilities and equipment necessary for performance of the Work. The District's Project Manager shall make a final acceptance inspection of the deliverables when completed and finished in all respects.

(c) If not otherwise addressed in the Statement of Work, upon written request, Consultant shall submit written progress reports to the District's Project Manager at the frequency requested in a form approved by the Project Manager at no additional cost to the District. The progress report shall provide an updated progress schedule, taking into account all delays and approved changes in the Work. Failure to provide a progress report will be cause to withhold payment.

4. **OWNERSHIP OF DELIVERABLES**

(a) All deliverables, including Work not accepted by the District, are District property when Consultant has received compensation therefor, in whole or in part. For any Work subject to patent, copyright, such Work is a "work made for hire" as defined by the patent and copyright laws of the United States. Consultant shall not make any representation otherwise and, upon request, shall sign any documents so affirming. Any District source documents or other District or non-District documents, specifications, materials, reports, or accompanying data developed, secured, or used in the performance of the Work, excluding proprietary materials, as outlined in the Statement of Work, are District property and shall be safeguarded and provided to the District upon request. District plans and specifications shall not be used on other work and, with the exception of the original plans and specifications, shall be returned to the District upon request. This obligation shall survive termination or expiration of this Agreement.

(b) The District shall have the unrestricted right to use and disseminate all of the above-referenced documents without payment of further compensation to Consultant, provided that any future use for other than the purpose intended by this Agreement shall be at the District's sole risk and without liability to Consultant. Consultant shall include language in all subcontracts clearly indicating that ownership and copyright to all materials produced pursuant to this Agreement remains with the District, as provided herein. All original sketches, tracings, drawings, computation details, calculations, field books and plans that result from the Work shall become the sole property of the District. Consultant shall submit all such work products to the District, if requested. Consultant may retain copies of all work products created pursuant to this Agreement.

5. FUNDING OF AGREEMENT

(a) For satisfactory performance of the Work, the District agrees to pay Contractor $109,483.41 (the "Total Compensation"). The amount expended hereunder shall be paid in accordance with and subject to the following multi-year funding allocations for each District fiscal year:

Fiscal Year: October 1, 2016 - September 30, 2017	Amount: $52,000.00
Fiscal Year: October 1, 2017 - September 30, 2018	Amount: $57,483.41

Funding for each applicable fiscal year is subject to District Governing Board budgetary appropriation.

(b) **Annual budgetary limitation**. For multi-fiscal year agreements, the District must budget the amount of funds that will be expended during each fiscal year as accurately as possible. The Statement of Work, Attachment A, includes the parties' current schedule for completion of the Work and projection of expenditures on a fiscal year basis (October 1 – September 30) ("Annual Spending Plan"). If Contractor anticipates that expenditures will exceed the budgeted amount during any fiscal year, Contractor shall promptly notify the District's Project Manager and provide a proposed revised work schedule and Annual Spending Plan that provides for completion of the Work without increasing the Total Compensation. The last date for the District to receive this request is August 1 of the then-current fiscal year. The District may in its sole discretion prepare a District Supplemental Instruction Form incorporating the revised work schedule and Annual Spending Plan during the then-current fiscal year or subsequent fiscal year(s).

6. PAYMENT OF INVOICES

(a) Consultant shall submit Monthly itemized invoices by one of the following two methods: (1) by mail to the St. Johns River Water Management District, Finance Director, 4049 Reid Street, Palatka, Florida 32177, or (2) by e-mail to acctpay@sjrwmd.com. Each invoice shall be submitted in detail sufficient for proper pre-audit and post-audit review. If necessary for audit purposes, Consultant shall provide additional supporting information as required to document invoices.

(b) **End of District Fiscal Year Reporting**. The District's fiscal year ends on September 30. Irrespective of the invoicing frequency, the District is required to account for all encumbered funds at that time. When authorized under the Agreement, submittal of an invoice as of September 30 satisfies this requirement. The invoice shall be submitted no later than October 30. If the Agreement does not authorize submittal of an invoice as of

September 30, Consultant shall submit, prior to October 30, a description of the additional Work completed between the last invoice and September 30, and an estimate of the additional amount due as of September 30 for such Work. If there have been no prior invoices, Consultant shall submit a description of the Work completed on the project through September 30 and a statement estimating the dollar value of that Work as of September 30.

(c) **Final Invoice**. The final invoice must be submitted no later than 45 days after the Completion Date; provided, however, that when the Completion Date corresponds with the end of the District's fiscal year (September 30), the final invoice must be submitted no later than 30 days after the Completion Date. **Final invoices that are submitted after the requisite date shall be subject to a penalty of 10 percent of the invoice. This penalty may be waived by the District, in its sole judgment and discretion, upon a showing of special circumstances that prevent the timely submittal of the final invoice. Consultant must request approval for delayed submittal of the final invoice not later than ten (10) days prior to the due date and state the basis for the delay.**

(d) All invoices shall include the following information: (1) District contract number; (2) District encumbrance number; (3) District work-order number, if applicable; (4) Consultant's name and address (include remit address, if necessary); (5) Consultant's invoice number and date of invoice; (6) District Project Manager or Work Order Manager, if applicable; (7) Consultant's Project Manager; (8) supporting documentation as to cost and/or project completion (as per the cost schedule and other requirements of the Statement of Work; for work-orders, see special requirements under **WORK ORDERS**); (9) Progress Report (if required); (10) Diversity Report (if otherwise required herein). Invoices that do not correspond with this paragraph shall be returned without action, stating the basis for rejection. Payment shall be made within forty-five (45) days of receipt of an approved invoice. Disputes regarding invoice sufficiency are resolved pursuant to the dispute resolution procedure of this Agreement.

(e) **Travel expenses**. If the cost schedule for this Agreement or project estimate for a Work Order (if applicable) includes a line item for travel expenses, travel expenses shall be drawn from the project budget and are not otherwise compensable. If travel expenses are not included in the cost schedule, they are a cost of providing the service that is borne by Consultant and are only compensable when specifically approved by the District as an authorized District traveler. In such instance, travel expenses must be submitted on District or State of Florida travel forms and shall be paid pursuant to District Administrative Directive 2000-02.

(f) **Payments withheld.** The District may withhold or, on account of subsequently discovered evidence, nullify, in whole or in part, any payment to such an extent as may be necessary to protect the District from loss as a result of: (1) defective Work not remedied; (2) failure of Consultant to make payments when due to subcontractors or suppliers for materials or labor; (3) failure to maintain adequate progress in the Work; (4) damage to another contractor; or (5) any other material breach of this Agreement. Amounts withheld shall not be considered due and shall not be paid until the ground(s) for withholding payment have been remedied.

(g) **Payments.** The District shall pay Consultant one hundred percent (100%) of each approved invoice.

7. **PAYMENT AND RELEASE.** Upon satisfactory completion of the Work, the District will provide Consultant a written statement accepting all deliverables. Acceptance of the final payment shall constitute a release in full of all claims against the District arising from or by reason of the Work, with the exception of any pending claims for additional compensation that have been documented and filed as required by this Agreement.

8. **INDEMNIFICATION.** Consultant shall indemnify and hold harmless, release, and forever dis charge the District, its public officers, employees, agents, representatives, successors, and assigns, from any and all liabilities, damages, losses, and costs, including, but not limited to, reasonable at torney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Consultant, its employees or sub-contractors, in the performance of the Work and result ing from damages to property, personal injury, or loss of life.

9. **INSURANCE.** Consultant shall acquire and maintain all insurance required by Attachment B, Insurance Requirements, and shall not commence Work until it has provided Certificates of Insurance to the District as per Attachment B. Receipt of Certificates of Insurance indicating less coverage than required does not constitute a waiver of the Insurance Requirements. Consultant waives its right of recovery against the District to the extent permitted by its insurance policies. Consultant's insurance shall be considered primary, and District insurance shall be considered excess, as may be applicable to Consultant's obligation to provide insurance.

10. **FUNDING CONTINGENCY.** This Agreement is at all times contingent upon funding availability, which may include a single source or multiple sources, including, but not limited to: (1) ad valorem tax revenues appropriated by the District's Governing Board; (2) annual appropriations by the Florida Legislature, or (3) appropriations from other agencies or funding sources. Agree ments that extend for a period of more than one Fiscal Year are subject to annual appropriation of funds in the sole discretion and judgment of the District's Governing Board for each succeeding Fiscal Year. Should the Work not be funded, in whole or in part, in the current Fiscal Year or succeeding Fiscal Years, the District shall so notify Consultant and this Agreement shall be deemed terminated for convenience five (5) days after receipt of such notice, or within such additional time as the District may allow. For the purpose of this Agreement, "Fiscal Year" is defined as the period beginning on October 1 and ending on September 30.

11. **PROJECT MANAGEMENT AND PERSONNEL**

(a) The Project Managers listed below shall be responsible for overall coordination and management of the Work. Either party may change its Project Manager upon three (3) business days prior written notice to the other party. Written notice of change of address shall be provided within five (5) business days. All notices shall be in writing to the Project Managers at the addresses below and shall be sent by one of the following methods: (1) hand delivery; (2) U.S. certified mail; (3) national overnight courier; (4) e-mail or, (5) fax. Notices via certified mail are deemed delivered upon receipt. Notices via overnight courier are deemed delivered one (1) business day after having been deposited with the courier. Notices via e-mail or fax are deemed delivered on the date transmitted and received.

DISTRICT
Pamela Bowen, Project Manager
St. Johns River Water Management District
4049 Reid Street
Palatka, Florida 32177
(386) 329-4870
E-mail: pbowen@sjrwmd.com

CONTRACTOR
Keith Patterson, Project Manager
Dewberry Consultants LLC
1000 North Ashley Drive, Suite 801
Tampa, Florida 33602
(813) 421-8635
E-mail: kpatterson@dewberry.com

(b) The District's Project Manager shall have sole responsibility for transmitting instructions, receiving information, and communicating District policies and decisions regarding all matters pertinent to performance of the Work, and may approve minor deviations in the Work that do not affect the Total Compensation or Completion Date or otherwise significantly modify the terms of the Agreement. For Work Order-based contracts, the District may designate a "Work Order Manager" on the Work Order, who will serve as the Project Manager for that Work Order and shall have the same responsibilities as the District's Project Manager. The District's Project Manager may approve minor deviations in the Work that do not affect the Total Compensation or Completion Date or otherwise significantly modify the terms of the Agreement.

(c) Consultant shall maintain an adequate and competent professional staff. Consultant's employees, subcontractors, or agents shall be properly trained to meet or exceed any specified licensing, training and/or certification applicable to their profession. Upon request, Consultant shall furnish proof thereof.

12. **SCHEDULING AND WORK PLANNING; PROGRESS REPORTING**

(a) **Pre-work Conference.** Within ten (10) days after execution of this Agreement, Consultant shall schedule a pre-work conference with the District's Project Manager to discuss scheduling and other matters. Contractor shall provide the District a list of each subcontract exceeding ten percent (10%) of the Total Compensation. The list shall include: (1) name, address, contract, phone number and email address of subcontractor, (2) description of subcontract work, and (3) estimated value of work.

(b) **Progress Reports**. Contractor shall provide to the District the project schedule and update/status reports as provided in the Statement of Work. Reports will provide detail on progress of the Work and outline any potential issues affecting completion or the overall schedule. Reports may be submitted in any form agreed to by District's Project Manager and Contractor, and may include emails, memos, and letters.

(c) **Daily Reporting.** The District may require Consultant to provide a daily report regarding the progress of the Work. The need for a daily report shall be determined at the pre-work conference. If required, a form shall be completed for each day any Work is performed until the project is accepted by the District. Completed forms shall be submitted to the District's Project Manager or other authorized representative by 9:00 a.m. of the following day.

(d) **Progress Meetings.** The District may elect to conduct on-site progress meetings with Consultant on a frequency to be determined by the District. In such event, Consultant shall make available its Project Manager and/or superintendent and other appropriate personnel to discuss matters pertinent to the Work.

(e) **Failure to Meet Schedule.** If progress of the Work falls five percent (5%) or more behind schedule, except as a result of District-approved delays, Consultant shall take all necessary steps to augment the work effort to get the project back on schedule. Should the progress of the Work fall ten percent (10%) or more behind schedule, the District may advise Consultant through a "cure" notice that this Agreement is subject to termination for cause if the failure is not cured within the time frame specified in said notice.

13. **DELAYS.** Consultant shall not be compensated for delays in the Work caused by Consultant's inefficiency, rework made necessary by Consultant's error, failure to perform the Work as scheduled, or any other corrective or productivity measures made necessary by errors, omissions, or failures to properly perform the Work. Within ten (10) days after the onset of a delay, Consultant shall notify the District in writing of the delay, which shall provide: (1) a detailed description of the delay and its probable duration, (2) the specified portion of the Work affected, and (3) an opinion as to the cause of the delay and liability (if any) for the delay. Notices provided more than ten (10) days after inception of the delay shall only be effective as to additional costs or de lay incurred during the ten (10) day period preceding receipt of such notice. In the case of continuing delay for the same cause, only one notice of delay is necessary. If the delay is due to causes beyond Consultant's control, as determined by the District in its sole judgment and discretion, the District may grant a time extension in the form of a written amendment signed by both parties.

14. **MODIFICATION OF SPECIFICATIONS; CHANGE ORDERS; EMERGENCY CHANGES IN WORK**

(a) **Modification of Specifications.** No verbal agreement or conversation with any officer, agent, or employee of the District after execution of this Agreement shall affect or modify any of its terms. No one is authorized to change any provision of the specifications without written authorization of the District. The presence or absence of a District inspector shall not relieve Consultant from any requirements of this Agreement. The District's Project Manager may authorize or direct minor changes in the Work not affecting the Total Compensation or the Completion Date, and not inconsistent with the purpose of the Work, upon issuance of the District's Supplemental Instructions (DSI) form (Attachment C). The DSI shall indicate that: (1) both parties agree that the changes in the Work will not affect the Total Compensation or the Completion Date, or (2) that Consultant believes that the proposed supplemental instructions will involve extra cost or extend the Completion Date. **Failure of Consultant to provide such written notice waives any claims for extra cost.** If the District continues to direct that the DSI be implemented, Consultant shall implement said instructions and may submit a Change Order, subject to the dispute resolution procedure. In an emergency condition, the parties shall follow the procedure for "Emergency Changes in the Work."

(b) **Change Orders**

(i) The District may alter, add to, or deduct from the Work by executing a Change Order without liability to Consultant, except for the reasonable cost of any additional Work. All such Work within Consultant's capacity to perform shall be performed pursuant to the Change Order. Any associated claim for extension of time will be adjusted when the Change Order is issued. The parties shall negotiate the cost of the Change Order on an equitable basis, which may be determined in one or more of the following ways: (1) estimate and acceptance of a lump sum, (2) unit prices named in the contract or subsequently agreed upon, (3) costs and percentage or by (4) cost and a fixed fee. If the parties cannot agree

upon cost, Consultant shall implement the Change Order and shall maintain and present in such form as the District Project Manager may direct the correct amount of the net cost of labor and materials, together with vouchers. The Project Manager will certify the amount due Consultant, including reasonable allowances for overhead and profit. Pending a final determination of value, payments will be based upon the District Project Manager's certification. Final resolution of the amount due to Consultant shall be pursuant to the dispute resolution procedure.

(ii) For any Change Order requests submitted by Consultant, the District may determine that District instructions to correct deficient Work, to stop the Work due to deficiencies in the Work, or any other matters that impose additional costs upon Consultant, do not warrant an increase in the Total Compensation or extension of the Completion Date. If Consultant disputes this determination, final resolution shall be pursuant to the dispute resolution procedure.

(c) **Emergency Changes in Work.** In the event an emergency endangering life or property requires immediate action, the District may give Consultant an oral instruction to proceed with an emergency change in the Work, which will be confirmed in writing within five (5) days. Within fifteen (15) days after commencement of the emergency change in the Work, Consultant shall provide the District with a written estimate of any increased costs or delays as a result thereof. **Failure to so notify the District constitutes a waiver of any right to an extension of time or increase in compensation**. Within fifteen (15) days after receipt of Consultant's estimate, the parties shall negotiate a Change Order. If unable to reach agreement, disputed issues shall be resolved pursuant to the dispute resolution procedure. In no event shall Consultant decline to perform the emergency change in the Work.

15. **TERMINATION AND SUSPENSION**

(a) **District Termination For Cause.** This Agreement may be terminated by the District for cause on ten (10) days written notice in the event of any breach hereof, including, but not limited to, Consultant's: (1) failing to carry forward and complete the Work; (2) failing to comply with applicable laws, regulations, permits, or ordinances; (3) failing to timely commence or continuously and vigorously pursue correction of defective Work; (4) failing to make payments when due to subcontractors, vendors, or others for materials or labor used in the Work; or (5) making a material misrepresentation to the District regarding the Work. Upon termination, the District may take possession of the Work and finish the Work by whatever method(s) the District deems expedient. The remedy enumerated herein is non-exclusive. The District may avail itself of any statutory and/or common law remedy not specifically set forth herein.

(b) **District Termination for Convenience.** Notwithstanding any other provision hereof, the District may at any time terminate this Agreement, or any portion of the Work, without cause, upon thirty (30) days written notice to Consultant. In such event, Consultant shall be compensated for any Work performed prior to the date of termination and for materials that were ordered prior to receipt of notice of termination that cannot be returned to the vendor, which shall become District property. Upon receipt of notice, Consultant shall discontinue the Work on the date and to the extent specified therein and shall place no further orders for materials, equipment, services, or facilities, except as needed to continue any portion of the Work not terminated. Consultant shall also make every reasonable effort to cancel, upon terms satisfactory to the District, all orders or

(b) **Work Area.** All Work shall be confined to the designated work area(s). Consultant shall obtain written approval from the District before making any adjustments.

(c) **Gates.** Consultant shall keep all gates to District lands or easements closed and locked in accordance with District specifications when not in use, and shall immediately notify the District when a gate has become impaired due to vandalism or other cause.

18. **ASSIGNMENT AND SUBCONTRACTS.** Consultant shall not sublet, assign, or transfer any Work involving more than fifteen percent (15%) of the total cost of the Work, or assign any mon ies due hereunder, without the District's prior written consent; provided, however, that in all cases, if the proposed subcontractor is different than the team specified by Consultant in the con tract award process, Consultant shall notify the District's Project Manager in writing and obtain the District's prior approval. Neither District approval of a subcontractor nor any other provision of this Agreement creates a contractual relationship between any subcontractor and the District. Consultant is responsible for fulfilling all work elements in any subcontracts and payment of all monies due. Consultant is fully responsible to the District for the acts and omissions of its sub contractors and persons directly or indirectly employed by them, and shall hold the District harm less from any liability or damages resulting from any subcontract to the extent allowed by law.

19. **AUDIT; ACCESS TO RECORDS.** Until the expiration of three (3) years after expenditure of funds hereunder, the District or its duly authorized representatives shall have access to examine any of Consultant's books and other records involving transactions related to this Agreement. Consultant shall preserve all such records for a period of not less than three (3) years. Consultant shall refund any payment(s) that are found to not constitute allowable costs based upon audit ex amination. All required records shall be maintained until an audit has been completed and all questions arising from it are resolved. Consultant will provide proper facilities for access to and inspection of all required records.

20. **CIVIL RIGHTS.** Pursuant to chapter 760, Fla. Stat., Consultant shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, age, handicap, or marital status.

21. **COMPUTER CODES**

(a) **Consultant Computer Codes.** Should Consultant incorporate proprietary software, methods or computer models ("Proprietary Software") developed by Consultant in the Work, such development not having been funded by the District pursuant to this Agreement or any prior agreement, Consultant may retain the proprietary rights to such Proprietary Software. Consultant shall identify in writing any such Proprietary Software to the extent it is incorporated in the Work. As part of the consideration for this Agreement, Consultant hereby grants the District a perpetual, non-exclusive license to the use of such Proprietary Software, including, but not limited to, its incorporation into a web-based computer model application that may be utilized by the general public. Documentation of Consultant's proprietary rights shall be provided to the District upon request. If a third party seeks access to the Proprietary Software as public records pursuant to section 119.07, Fla. Stat., the District shall notify Consultant in writing of the request so that Consultant may assert its proprietary interest. Consultant agrees to indemnify and hold the District harmless from all costs, damages, and expenses, including attorney's fees, arising from any suit by a third party claiming an interest in the Proprietary Software or a right to inspect the Proprietary Software as a public record. This obligation shall survive termination of this Agreement.

(b) **District Computer Codes.** Consultant shall not be entitled to claim any proprietary right to computer codes that are developed by Consultant in fulfilling the requirements of the Work, which shall be considered a "work for hire" under applicable copyright and/or patent law. Such computer codes, which constitute a Deliverable hereunder, are the sole and exclusive property of the District. The District may copyright or patent such computer codes in its own name to the full extent authorized by law.

22. **CONFLICTING EMPLOYMENT.** By entering into this Agreement, Consultant represents and warrants that, as of the effective date of the Agreement, Consultant has no conflicting employ ment. "Conflicting employment" means instances in which the Consultant's Project Manager or professional Consultant employee assigned to the project team involved in performance of this Agreement, or the professional employee of any sub-contractor of Consultant involved in performance of this Agreement, provides services to any person or entity whose interests are adverse to those of the District, including, but not limited to, representing or providing consulting services to parties involved in permit applications that are pending before the District. In the event such con flicting employment exists or develops during the performance of this Agreement, Consultant shall eliminate the conflict by terminating or modifying its business relationship with the non-District person or entity from which the conflict arises, or making changes in personnel to eliminate the conflict; provided, however, that changes in key personnel involved in performance of this Agreement must be approved by the District. Consultant further represents that, until the Work has been completed in accordance with the terms hereof, Consultant shall have no undisclosed conflict of interest between the services to be provided under this Agreement and services being provided by Consultant to any other clients. Should Consultant or the District become aware of any such conflict, that party will promptly notify the other party thereof, which shall in clude timely notice from Consultant's Project Manager to the District's Project Manager of all permit applications submitted to the District where the applicant is being represented or assisted by a Consultant professional employee involved in the performance of this Agreement. Consult ant and the District shall negotiate in good faith to resolve any conflict. Notwithstanding the fore going, Consultant may accept retainers from or be employed by third parties whose interest may conflict or appear to conflict or be inconsistent with that of the District if, after full written disclosure of the facts to the District, the District determines, in its sole discretion and judgment, that such actual or apparent conflict shall not interfere with the performance of the Work by Consult ant or otherwise be significantly adverse to the interests of the District. No Consultant Employee who, through this Agreement or its renewals, receives training or experience in the regulatory op erations of the District by acting in the capacity of a permit reviewer may, during the term of this Agreement, including renewals, perform any work or provide any assistance, either directly or indirectly, to any applicant or anticipated applicant for a District permit.

23. **CONTINGENCY FEES.** Pursuant to section 287.055(6)(a), Fla. Stat., Consultant warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for Consultant, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for Consultant, any fee, commission, percentage, or other consideration, contingent upon or resulting from the award or making of this Agreement. For breach or violation of these provisions, the District may terminate this Agreement without liability and, at its discretion, deduct from the contract price or otherwise recover the full amount of any such fee, commission, percentage, gift, or other consideration.

24. **CORRELATION AND INTENT OF DOCUMENTS; QUESTIONS OR ISSUES REGARDING PERFORMANCE OF THE WORK**

(a) This Agreement and all attachments are complementary. What is called for by one is as binding as if called for by all. The intent is to include all labor and materials, equipment, transportation, and incidentals necessary for the proper and complete execution of the Work. Materials or work described in words, which so applied have a well-known technical or trade meaning, shall be held to refer to such recognized standards.

(b) It is the District's intention to fully assist Consultant in the successful performance of the Work and to respond in a timely manner to questions or issues that arise. Consultant should discuss any questions or issues with the District's Project Manager and communicate such questions or issues in writing when required by this Agreement. The District shall respond through its Project Manager.

25. **DISPUTE RESOLUTION.**

(a) **During the course of work.** In the event any dispute arises during the course of the Work, Contractor shall fully perform the Work in accordance with the District's written instructions and may claim additional compensation. Contractor is under a duty to seek clarification and resolution of any issue, discrepancy, or dispute by submitting a formal request for additional compensation, schedule adjustment, or other dispute resolution to the District's Project Manager no later than fifteen (15) calendar days after the precipitating event. If not resolved by the Project Manager within five (5) business days, the Project Manager shall forward the request to the District's Office of General Counsel, which shall issue a written decision within fifteen (15) calendar days of receipt. This determination shall constitute final action of the District and shall then be subject to judicial review upon completion of the Work. **Contractor shall proceed with the Work in accordance with said determination. This shall not waive Contractor's position regarding the matter in dispute.**

(b) **Invoices**. In the event the District rejects an invoice as improper, and the Contractor declines to modify the invoice, the Contractor must notify the District in writing within ten (10) calendar days of receipt of notice of rejection that the Contractor will not modify the invoice and state the reason(s) therefor. Within five (5) business days of receipt of such notice, if not informally resolved through discussion with the District Project Manager, the Project Manager shall forward the disputed invoice and the Contractor's written response to the District's Office of General Counsel. The matter shall then proceed as described in subsection (a), above.

26. **DIVERSITY REPORTING**. The District is committed to the opportunity for diversity in its procurement activities, and encourages its prime vendors (contractors and suppliers) to make a good faith effort to ensure that women and minority-owned business enterprises (W/MBE) are given the opportunity for maximum participation as sub-contractors. The District will assist Consultant by sharing information on W/MBEs. Consultant shall provide with each invoice a report describing the company names for all W/MBEs, the type of minority, and the amount spent with each at all levels. The report will also denote if there were no W/MBE expenditures.

27. **DUTY TO INSPECT AND REPORT DEFICIENCIES IN PLANS AND SPECIFICATIONS**

(a) For any Work that is dependent upon conditions at the worksite, Consultant's acceptance of contract award represents and warrants that Consultant has inspected and satisfied itself concerning the nature and location of the Work and general and local conditions, including, without limitation: (1) conditions affecting transportation, disposal, handling, and storage of materials; (2) availability and quality of labor; (3) availability and condition of roads; (4) climatic conditions and seasons; (5) hydrology of the terrain; (6) topography and ground surface conditions; (7) nature and quantity of surface materials to be encountered; (8) equipment and facilities needed preliminary to and during the Work; and (9) all other matters that can affect the Work and the cost thereof. Consultant's failure to acquaint itself with such conditions will not relieve it from its responsibility for properly estimating the time required or cost of performing the Work. Where the District has investigated subsurface conditions, this data may be provided to Consultant and is available upon request. Consultant must either seek clarification concerning the data or assume responsibility for its interpretation. .

(b) If Consultant in the course of the Work finds any defect in the plans and specifications, including, but not limited to, any discrepancy between the drawings and the physical conditions at the worksite, or any errors or omissions in the drawings or in the layout, as given by points and instructions, it shall immediately inform the District in writing, which shall be promptly verified by the District. Any Work done after such discovery, until authorized, will be done at Consultant's risk as to cost overruns and modifications necessary to correct deficiencies in the Work. To ensure the proper execution of its subsequent Work, Consultant shall measure Work already in place or completed and shall immediately report any discrepancy between the executed Work and the drawings or other specifications

28. **GOVERNING LAW, VENUE, ATTORNEY'S FEES, WAIVER OF RIGHT TO JURY TRIAL.** This Agreement shall be construed according to the laws of Florida and shall not be construed more strictly against one party than against the other because it may have been drafted by one of the parties. As used herein, "shall" is always mandatory. In the event of any legal proceedings arising from or related to this Agreement: (1) venue for any state or federal legal proceedings shall be in Orange County; (2) each party shall bear its own attorney's fees, including appeals; (3) for civil proceedings, the parties hereby consent to trial by the court and waive the right to jury trial.

29. **INTEREST IN THE BUSINESS OF CONTRACTOR; NON-LOBBYING.** Consultant certifies that no officer, agent, or employee of the District has any material interest, as defined in chapter 112, Fla. Stat., either directly or indirectly, in the business of Consultant to be conducted under this Agreement, and that no such person shall have any such interest at any time during the term of this Agreement. Pursuant to section 216.347, Fla. Stat., monies received from the District pursuant to this Agreement shall not be used to lobby the Florida Legislature or any other state agency.

30. **INDEPENDENT CONTRACTOR.** Consultant is an independent contractor. Neither Consultant nor Consultant's employees are employees or agents of the District. Consultant controls and directs the means and methods by which the Work is accomplished. Consultant is solely responsible for compliance with all labor and tax laws pertaining to it, its officers, agents, and employees, and shall indemnify and hold the District harmless from any failure to comply with such laws. Consultant's duties include, but not be limited to: (1) providing Workers' Compensation coverage for employees as required by law; (2) hiring

subcontracts related to the terminated Work. Consultant may not claim any compensation not specifically provided for herein, including, but not limited to: loss of anticipated profits; idle equipment, labor, and facilities; and any additional claims of subcontractors and vendors.

(c) **District Suspension for Convenience.** The District may direct Consultant to stop Work, in whole or in part, whenever the District, in its sole judgment and discretion, determines that such stoppage is necessary to ensure proper completion of the Work, avoid injury to third persons, or otherwise meet the District's objectives. The District shall provide Consultant not less than five (5) days written notice, except in an emergency. Consultant shall immediately comply with such notice. Should such stoppage increase Consultant's cost, an equitable adjustment will be made by Change Order. The notice shall be effective until rescinded in writing, unless the period of suspension is stated in the notice.

(d) **Consultant's Right to Terminate Agreement.** Consultant may terminate this Agreement if the District fails to pay undisputed and adequately documented sums when due hereunder. In such event, Consultant shall provide the District no less than ten (10) days prior written notice of its intention to terminate this Agreement and afford the District an opportunity to cure the grounds for termination within said period. In any other event, dispute, or other matter arising under this Agreement, Consultant shall fully perform the Work in accordance with the District's written instructions and may claim additional compensation as a Change Order, subject to the dispute resolution procedure.

ADDITIONAL PROVISIONS
(In Alphabetical Order)

16. **DEFINITIONS**

ADDENDA: Written or graphic instruments issued prior to the opening of Bids, which make additions, deletions, or revisions to the solicitation or contract documents.

AGREEMENT: The written contract between the District and Consultant covering the Work, which includes all documents attached to this Agreement or incorporated herein by reference. The words "contract" and "Agreement" are synonymous in these documents.

AMENDMENT: Any written change made to the terms and conditions of the Agreement.

CHANGE ORDER: A written agreement of the parties after the Commencement Date to amend this Agreement so as to modify the Statement of Work or the Total Compensation or provide for an extension of time.

COMMENCEMENT DATE: The date upon which the Work is authorized to proceed.

COMPLETION DATE: The date by which the Work is required to be completed.

CONTRACTOR: Consultant, its officers, employees, agents, successors, and assigns.

CONTRACTOR's PROJECT MANAGER: The individual designated by the Consultant to be responsible for overall coordination, oversight, and management of the Work for Consultant.

CONTRACTOR's SUPERINTENDENT: Consultant's representative who is present during the progress of the Work and authorized to receive and fulfill instructions from the Consultant's Project Manager or the District.

DAY: Each day shown on the calendar.

DELIVERABLES: All Work that is to be performed pursuant to the Statement of Work, in whole or in part, including, but not limited to, all equipment or materials that are incorporated within the Work.

DISTRICT: The St. Johns River Water Management District, its Governing Board, officers, agents, and employees.

DISTRICT'S PROJECT MANAGER: The District employee designated by the District to be responsible for overall coordination, oversight, and management of the Work for the District.

DISTRICT'S SUPPLEMENTAL INSTRUCTION: Instructions issued by the District's Project Manager to make minor changes in the Work not affecting the Total Compensation or the Completion Date, and consistent with the purpose of the Work.

FINAL RELEASE OF LIENS: The instrument that is to be signed by Consultant and submitted to the District upon completion of the Work showing that all bills from subcontractors have been paid.

INSPECTOR: The District's Project Manager or an authorized representative of the District who is assigned to inspect the Work.

PERSON: Any individual, partnership, society, association, joint stock company, corporation, estate, receiver, trustee, assignee, referee, or capacity, whether appointed by a court or others, and any combination of individuals.

RESPONDENT: Any person who submits a Bid in response to an Invitation for Bids or a proposal in response to a Request for Proposals.

STATEMENT OF WORK: The District's written directions, requirements and technical specifications for completing the Work. Standards for specifying materials or testing that are incorporated therein by reference shall have the same force and effect as if fully set forth therein.

SUBCONTRACTORS: Those persons having a direct contract with Consultant relating to performance of the Work, including one who furnishes material worked into a special design in accordance with the plans or specifications of the Work, but not including one who merely furnishes material.

TOTAL COMPENSATION: The total funds to be expended pursuant to this Agreement upon satisfactory completion of the Work.

WORK: All labor, materials, equipment, transportation, supporting documentation, and other products, services, or facilities necessary for complete performance of the Agreement.

17. **ACCESS; WORK AREA; GATES**

(a) **Access.** The District will provide sufficient access to accomplish Work performed on District property.

employees or subcontractors necessary to perform the Work; (3) providing any and all employment benefits, including, but not limited to, annual leave, sick leave, paid holidays, health insurance, retirement benefits, and disability insurance; (4) payment of all federal, state and local taxes, income or employment taxes, and, if Consultant is not a corporation, self-employment (Social Security) taxes; (5) compliance with the Fair Labor Standards Act, 29 U.S.C. §§ 201, et seq., including payment of overtime as required by said Act; and (6) providing employee training, office or other facilities, equipment and materials for all functions necessary to perform the Work. In the event the District provides training, equipment, materials, or facilities to meet specific District needs or otherwise facilitate performance of the Work, this shall not affect Consultant's duties hereunder or alter Consultant's status as an independent contractor. This paragraph does not create an affirmative obligation to provide any employee benefits not required by law.

31. **ORGANOCHLORINE PESTICIDES.** The Lake Apopka North Shore Restoration Area (NSRA) is former agricultural property. Soil samples from the NSRA indicate organochlorine pesticide levels that exceed Florida Department of Environmental Protection's Industrial/Commercial soil cleanup target levels. Consultants working in the NSRA are responsible for taking all appropriate measures to provide for the safety of their employees. Recommended measures should be designed to minimize contact with the soil through engineering controls, which may include: (1) wearing waders or rubber boots and gloves to minimize contact with soil and sediments, (2) washing thoroughly with soap and water after contact with soils or sediments, (3) decontaminating any equipment in contact with soil or sediment through washing with soap and water and (4) using enclosed cabs or dust masks to minimize exposure to dust created by Consultant's activities.

32. **PERMITS AND LICENSES; COMPLIANCE WITH LAW.** Consultant shall comply with all applicable federal, state and local laws and regulations, including those pertaining to health and safety. All materials used and work performed must conform to the laws of the United States, the state of Florida and county and municipal ordinances. Consultant represents and warrants that it is duly licensed to perform the Work in accordance with the laws of the state of Florida and the county or municipality in which the Work is to be performed. Unless otherwise specifically provided for herein, Consultant shall give to the proper authorities all required notices relative to the Work in its charge; obtain and pay for all official permits or any other licenses, including any and all professional licenses required by the nature of the Work; and furnish any bonds, security, or deposits required to permit performance of the Work. Consultant is responsible for the resolution of any issues resulting from a finding of noncompliance by any regulatory agencies, due to the Consultant's failure to comply with applicable regulatory requirements, including all costs for delays, litigation, fines, or other costs.

33. **PUBLIC ENTITY CRIME.** A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in s. 287.017 for CATEGORY TWO ($35,000) for a period of 36 months following the date of being placed on the convicted vendor list.

34. **PUBLIC RECORDS.**

(a) Contractor is responsible for identifying confidential trade secret information as such upon submittal to the District. Notwithstanding any other provision hereof, the District shall not be liable to Contractor for release of confidential information not identified as such upon submittal. If the District receives a public records request that requests information claimed to be confidential by

Contractor, the District shall take such steps as are necessary to comply with chapter 119, Fla. Stat., while protecting the confidentiality of trade secret information. In the event of a dispute as to whether the requested information is a trade secret, Contractor shall be liable for all costs incurred by the District resulting from the dispute, including any court costs and attorney's fees. The calculation of those costs shall not include costs that are charged to the public records requestor.

(b) Contractor shall comply with Florida Public Records law under Chapter 119, Fla. Stat. Records made or received in conjunction with this Agreement are public records under Florida law, as defined in Section 119.011(12), Fla. Stat. Contractor shall keep and maintain public records required by the District to perform the services under this Agreement.

(c) If Contractor meets the definition of "Contractor" found in Section 119.0701(1)(a), Fla. Stat.; [i.e., an individual, partnership, corporation, or business entity that enters into a contract for services with a public agency and is acting on behalf of the public agency], then the following requirements apply:

i. Pursuant to Section 119.0701, Fla. Stat., a request to inspect or copy public records relating to this Agreement for services must be made directly to the District. If the District does not possess the requested records, the District shall immediately notify the Contractor of the request, and the Contractor must provide the records to the District or allow the records to be inspected or copied within a reasonable time. If Contractor fails to provide the public records to the District within a reasonable time, the Contractor may be subject to penalties under s. 119.10, Fla. Stat.

ii. Upon request from the District's custodian of public records, Contractor shall provide the District with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Fla. Stat., or as otherwise provided by law.

iii. Contractor shall identify and ensure that all public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Agreement term and following completion of the Agreement if the Contractor does not transfer the records to the District.

iv. Upon completion of the Agreement, Contractor shall transfer, at no cost to District, all public records in possession of Contractor or keep and maintain public records required by the District to perform the services under this Agreement. If the Contractor transfers all public records to the District upon completion of the Agreement, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public disclosure requirements. If the Contractor keeps and maintains public records upon completion of the Agreement, the Contractor shall meet all applicable requirements for retaining public records. All records that are stored electronically must be provided to the District, upon request from the District's custodian of public records, in a format that is accessible by and compatible with the information technology systems of the District.

(d) **IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS**

RELATING TO THIS CONTRACT, CONTACT THE DISTRICT'S CUSTODIAN OF PUBLIC RECORDS AT:

District Clerk
St. Johns River Water Management District
4049 Reid Street
Palatka, Florida 32177
(386) 329-4127
sbertram@sjrwmd.com

35. **RELEASE OF INFORMATION**. Consultant shall not publish or release any information related to performance of this Agreement, or prepare, publish, or release any news or press release in any way related to this Agreement, without prior District review and written consent.

36. **REMEDIES FOR NON-PERFORMANCE**

(a) **District Remedies.** The remedies enumerated herein are non-exclusive. In addition to the remedies set forth below, the District may avail itself of any statutory and/or common law remedies not set forth herein. In the event of a breach, the District may terminate this Agreement for cause. Alternatively, the District may allow Consultant to correct the deficiency, or may take such action as is necessary to correct such deficiency through District action or that of a third party. Delay or failure by the District to enforce any right or remedy hereunder shall not impair, or be deemed a waiver of, any such right or remedy, or impair the District's rights or remedies for any subsequent breach of this Agreement.

(b) **Consultant Correction of Deficiencies.** The District shall provide Consultant with written notice of deficiency. At the District's sole judgment and discretion, the District may afford an opportunity to correct said deficiency, in which event the notice shall specify the time allowed to cure. If Consultant disputes that a failure of performance has occurred, Consultant shall, nevertheless, perform the corrective action and may submit a request for a Change Order subject to the dispute resolution procedure. Unless authorized through a Change Order, the Completion Date shall not be extended in order to correct deficiencies. Consultant shall bear the cost of correcting all work of other contractors that is destroyed, damaged, or otherwise negatively impacted by its corrective action. Failure to take timely corrective action may result in termination for cause or the District pursuing alternative remedies, as provided herein.

(c) **Alternative Remedies to Correct Deficiency.** If the District determines that it is not in its best interest for Consultant to correct incomplete or damaged Work caused by Consultant's failure of performance, the District may pursue any or all of the following remedies, in whole or in part: (1) accept the Work as is and deduct the reasonable value of the deficient Work from the Total Compensation; (2) complete the Work through the utilization of District employees and deduct the cost thereof from the Total Compensation; (3) contract with a third party to complete the deficient Work and deduct the cost thereof from the Total Compensation.

(d) **District Technical Assistance.** The District may elect to provide technical assistance to Consultant in order to complete satisfactory performance of the Work. If the District is performing a function that Consultant is required to perform, the District may deduct the cost of providing such technical assistance from the Total Compensation. Prior to providing any such technical assistance, the District shall notify Consultant that it considers such assistance to be above and beyond its duties under this Agreement and that it intends to deduct the cost of providing such assistance from the Total Compensation. Consultant shall not be entitled to reject technical assistance when the District determines that such assistance is necessary to complete the Work.

37. **ROYALTIES AND PATENTS.** Consultant certifies that, to the best of its information and belief, the Work does not infringe on any patent rights. Unless provided otherwise herein, Consultant shall: (1) pay all royalties, patent, and license fees necessary for the Work; (2) defend all suits or claims for infringement of any patent rights, and (3) save and hold the District harmless from loss on account thereof; provided, however, that the District shall be responsible for any such losses when the utilization of a particular process or product of a particular manufacturer is specified by the District. If Consultant obtains information that the process or article so specified is a patent infringement, it shall be responsible for such loss unless it promptly so notifies the District.

38. **SAFETY.** For any Work that is to be performed on premises that are owned or controlled by the District (the Premises), Consultant has the sole and exclusive duty for the safety of the premises. Consultant shall provide and maintain sufficient protection for the safety of its employees and other persons who may utilize the Premises, and prevent damage to District property, materials, and equipment. Consultant shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the work assigned. Neither Consultant nor its subcontractors shall allow or cause to be allowed any hunting or any weapons, animals, alcohol, or drugs, on or from the Premises or adjacent property. Consultant employees shall not park their vehicles or store equipment or materials adjacent to roads where it may be a hazard to traffic. A clear distance of at least 30 feet from the edge of the pavement or right-of-way shall be kept free of any obstacles unless otherwise authorized by the District. Consultant shall ensure that only authorized personnel are allowed on the worksite and shall post notices warning both employees and the public of all safety hazards created by Consultant.

39. **TRUTH IN NEGOTIATIONS.** This provision applies only to lump sum or cost-plus-a-fixed-fee contracts entered into in excess of $195,000 (see section 287.055(5)(a), Fla. Stat.). Consultant certifies that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting. The original contract price and any additions shall be adjusted to exclude any significant sums by which the District determines the contract price was increased due to inaccurate, incomplete, or noncurrent wage rates and other actual unit costs.

40. **USE OF COMPLETED PORTIONS OF THE WORK.** The District shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the fact that the time for completing the entire Work or such portions may not have expired. Such taking of possession and use will not be deemed an acceptance of any Work not completed. If such possession and use increases the cost of or delays the Work, Consultant shall be entitled to a Change Order for extra compensation, or extension of time, as necessary, to offset the effect of such prior possession and use.

IN WITNESS WHEREOF, the St. Johns River Water Management District has caused this Agreement to be executed on the day and year written below in its name by its Executive Director, or duly authorized designee, and Consultant has caused this Agreement to be executed on the day and year written below in its name by its duly authorized representatives, and, if appropriate, has caused the seal of the

corporation to be attached. This Agreement may be executed in separate counterparts, which shall not affect its validity. Upon execution, this Agreement constitutes the entire agreement of the parties, notwithstanding any stipulations, representations, agreements, or promises, oral or otherwise, not printed or inserted herein. This Agreement cannot be changed by any means other than written amendments referencing this Agreement and signed by all parties.

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

By: _____
Ann B. Shortelle, Ph.D., Executive Director (or designee)

Date: Jan 4, 2017

ONLY AS TO FORM AND LEGALITY

_____
Assistant General Counsel

DEWBERRY CONSULTANTS LLC

By: _____
Digitally signed by Amar Nayegandhi
DN: cn=Amar Nayegandhi, o=Dewberry Consultants LLC, ou, email=anayegandhi@dewberry.com, c=US
Date: 2016.12.29 13:24:40 -05'00'

Amar Nayegandhi, Vice President
Typed Name and Title

Date: 12/29/2016

Attest: _____

_____
Typed Name and Title

Attachment A: Statement of Work
Attachment B: Insurance Requirements
Attachment C: District's Supplemental Instructions (sample)

Engineering Services
Last updated: 10-28-13

ATTACHMENT A – STATEMENT OF WORK

Documentation of Vegetation Communities in the
Lake Apopka and Upper Ocklawaha River Basins in 2017

I. Background

Ecological change in a restoration area can be effectively and economically monitored over time with the use of vegetation maps created from aerial photography. By comparing photointerpretation of vegetation from one period to another, detectable changes in vegetation communities can be identified. These changes may result from natural processes and stochastic events or from anthropogenically altered functions, such as planting, changing hydrology, and enhancing water quality. Quantifying plant community changes using photointerpretation of vegetation can provide a measure of restoration efforts in altered wetland habitats.

This project will produce digital aerial photography of the Lake Apopka and Upper Ocklawaha River basins. The digital imagery will be used to create maps of vegetation communities on the District's Lake Apopka North Shore (LANS), the southern half of Lake Apopka, Emeralda Marsh Conservation Area (EMCA), Ocklawaha Prairie Restoration Area (OPRA), and Sunnyhill Restoration Area (SRA) for 2017. These products will provide the tools necessary to evaluate restoration activities and their impact over time. The maps will be produced by photointerpreters experienced with field identification and photointerpretation of vegetation species and community types in Florida. Photointerpretation is to be performed in stereo using a soft-copy stereoplotter. Raw digital aerial photography will be acquired by the Contractor for the project. Digital orthophotos and digital mosaics will be created from the raw digital aerial photography of the LANS, EMCA, OPRA, and SRA. All work will be performed under the direct supervision of a Florida Professional Surveyor and Mapper (PSM) highly experienced with the identification and photointerpretation of Florida vegetation species and communities.

Since 2002, the District has inundated the former Duda property, Unit I and II on the LANS, the Sand Farm marsh, and the Marsh Flow Way (MFW) in the Lake Apopka basin. This project will provide a cost-effective means of monitoring vegetation on the LANS and MFW, EMCA, OPRA, and SRA and it will also capture ecologically significant changes in vegetation communities on these properties during restoration. The last vegetation communities map project for these properties was conducted using imagery taken in 2013. This project will also provide a vegetation community map of the southern half of Lake Apopka. This project will consist of updated map products that will provide the data necessary to assess the various ecological changes that have occurred on the conservation and restoration areas in this basin during the last several years.

II. Objectives

The objectives for this project are:

1. Acquire and produce raw digital aerial photography (frame-based, 4-band, red, blue, green, and near infrared) of the District's Lake Apopka and Upper Ocklawaha River basins. Provide airborne GPS (ABGPS) and inertial measurement unit (IMU) data, center-point data, a camera calibration report, a mission log with acquisition dates, and a hard-copy flight line map for this imagery.
2. Create digital orthophotos from the raw digital aerial photography images covering the Lake Apopka LANS, MFW, and adjoining properties, EMCA, OPRA, and SRA. Combine the orthophotos to create two digital mosaics of each area, a true-color mosaic and an infrared mosaic.
3. Post-process and aero triangulate all digital images necessary to map the LANS and MFW and the southern half of Lake Apopka. Conduct fieldwork and create a file geodatabase in ESRI's 10.0 or 10.1 format of the vegetation communities on the LANS and MFW and adjoining properties, and

the southern half of Lake Apopka in 2016-2017 based on stereo photointerpretation of the digital imagery created from the digital aerial photography using a soft-copy stereoplotter and the District's vegetation classifications shown in Appendix 1. Using the file geodatabase, create one ArcGIS map of the vegetation communities found on the LANS, MFW and adjoining properties, and create a second map of the vegetation communities mapped on the southern half of Lake Apopka in 2016-2017. Provide the ArcGIS files necessary to create these maps.

4. Post-process and aero triangulate all digital images necessary to map the EMCA, OPRA, and SRA in the Upper Ocklawaha River Basin. Conduct fieldwork and create a file geodatabase in ESRI's 10.0 or 10.1 format of the vegetation communities on EMCA, OPRA, and SRA in 2016-2017 based on stereo photointerpretation of the digital imagery using a soft-copy stereoplotter and the District's vegetation classifications shown in Appendix 1. Using the file geodatabase, create ArcGIS maps of the vegetation communities found in the conservation or restoration areas in 2016-2017. Provide the ArcGIS files necessary to create these maps.
5. Provide a final report for 2016-2017 that describes the methodology used to create the raw imagery, digital orthophotography and mosaics, the ArcGIS files of all of the vegetation communities identified in the Lake Apopka Basin and in the Upper Ocklawaha River Basin, and the project metadata.

III. Scope of Work

Raw Digital Aerial Photography and Associated Data - Areas to be Photographed

The target areas for this project are depicted in Figure 1 and cover approximately 751 square miles. The District will provide digital boundaries in ArcGIS shapefile format for the Lake Apopka Basin and the Upper Ocklawaha River Basin described below.

Lake Apopka Basin – Approximately 199 square miles in Lake and Orange counties. Includes lands and water bodies lying generally north of State Road 50, east of Hwy 561, west of 435, and south of 448. Includes all of Lake Apopka, restoration areas adjacent to the northern shore of the lake, and surrounding lands.

Upper Ocklawaha River Basin – Portions of Marion and Lake counties encompassing about 552 square miles. These include EMCA, OPRA, and SRA, and the Ocklawaha Chain of Lakes.

Flightlines from a previous imagery project covering these two basins are shown Figure 1 on the following page.

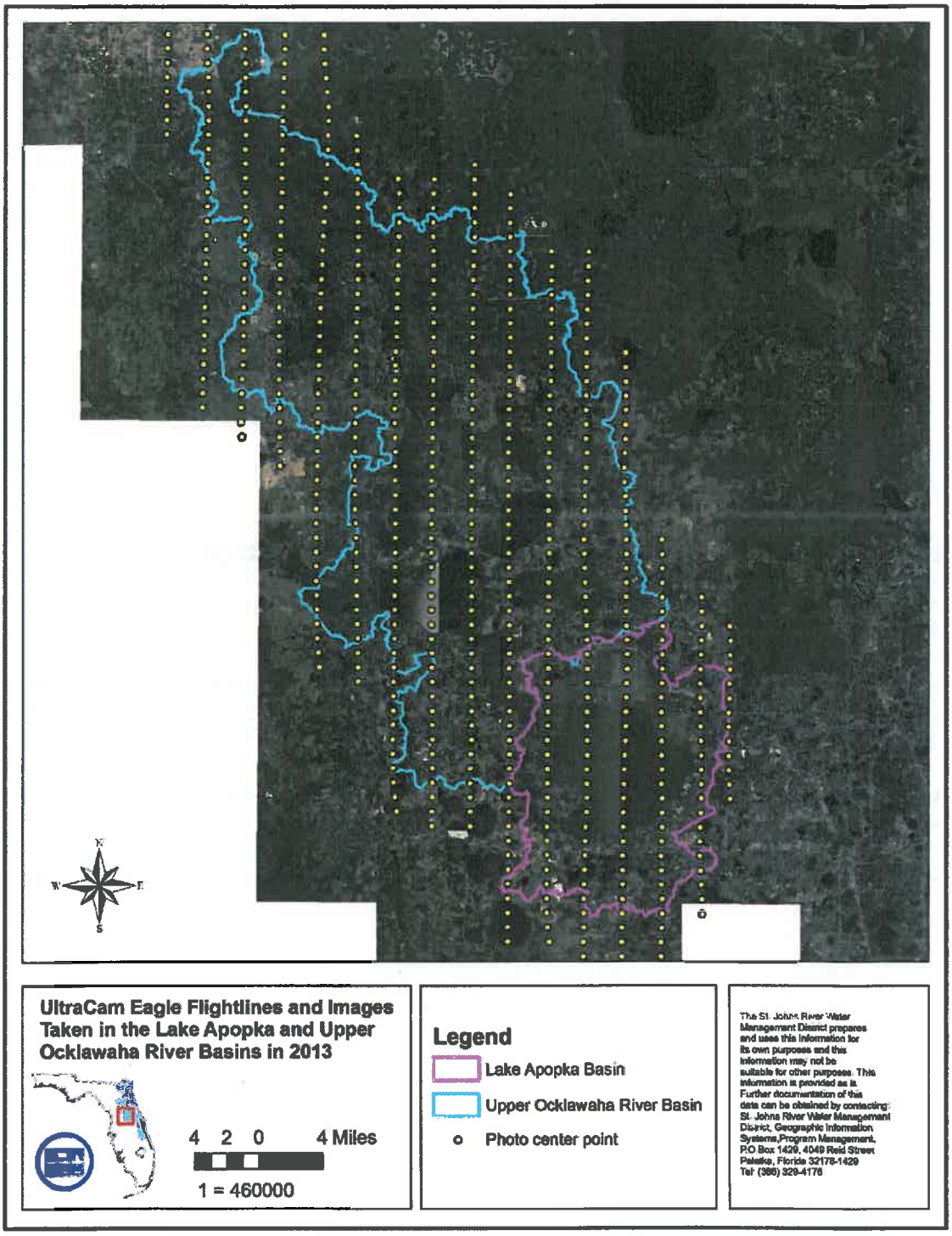

Figure 1. Boundaries of the Lake Apopka and Upper Ocklawaha River basins and the flightlines and photo centers taken in 2013 with an UltraCam Eagle sensor. Approximately 597 photo frames were taken to cover both basins.

Digital Orthophotos and Mosaics of LANS, MFW, and Adjoining Properties

The target area for this portion of the project is depicted in Figure 2 and is outlined in the yellow box. It covers approximately 92 square miles and there are approximately 54 UltraCam Eagle photo frames that cover the area. The District will provide an ArcGIS shapefile with the boundaries of the area to be included in the mosaic.

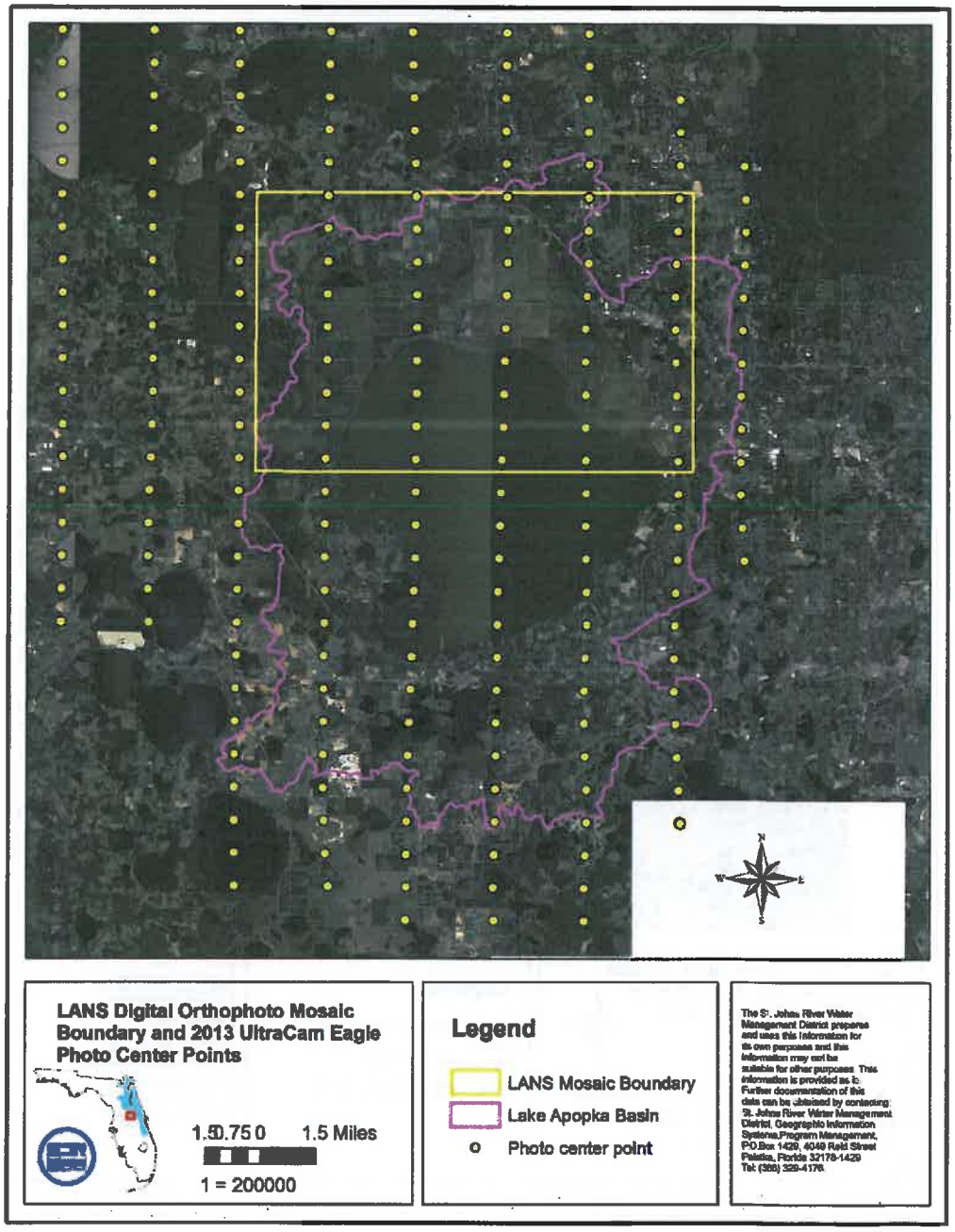

Figure 2. Boundary of the digital mosaic created from orthophotos of the LANS, MFW, and adjoining properties.

Digital Orthophotos and Mosaics of EMCA, OPRA, and SRA

The target areas for these mosaics in the project are depicted in Figure 3 and are outlined in the yellow boxes. The mosaic for OPRA includes 14 UltraCam Eagle photo frames. The mosaic for SRA includes 30 photo frames and the mosaic for EMCA includes 12 photo frames. The District will provide the ArcGIS shapefiles with the boundaries of the areas to be included in each mosaic.

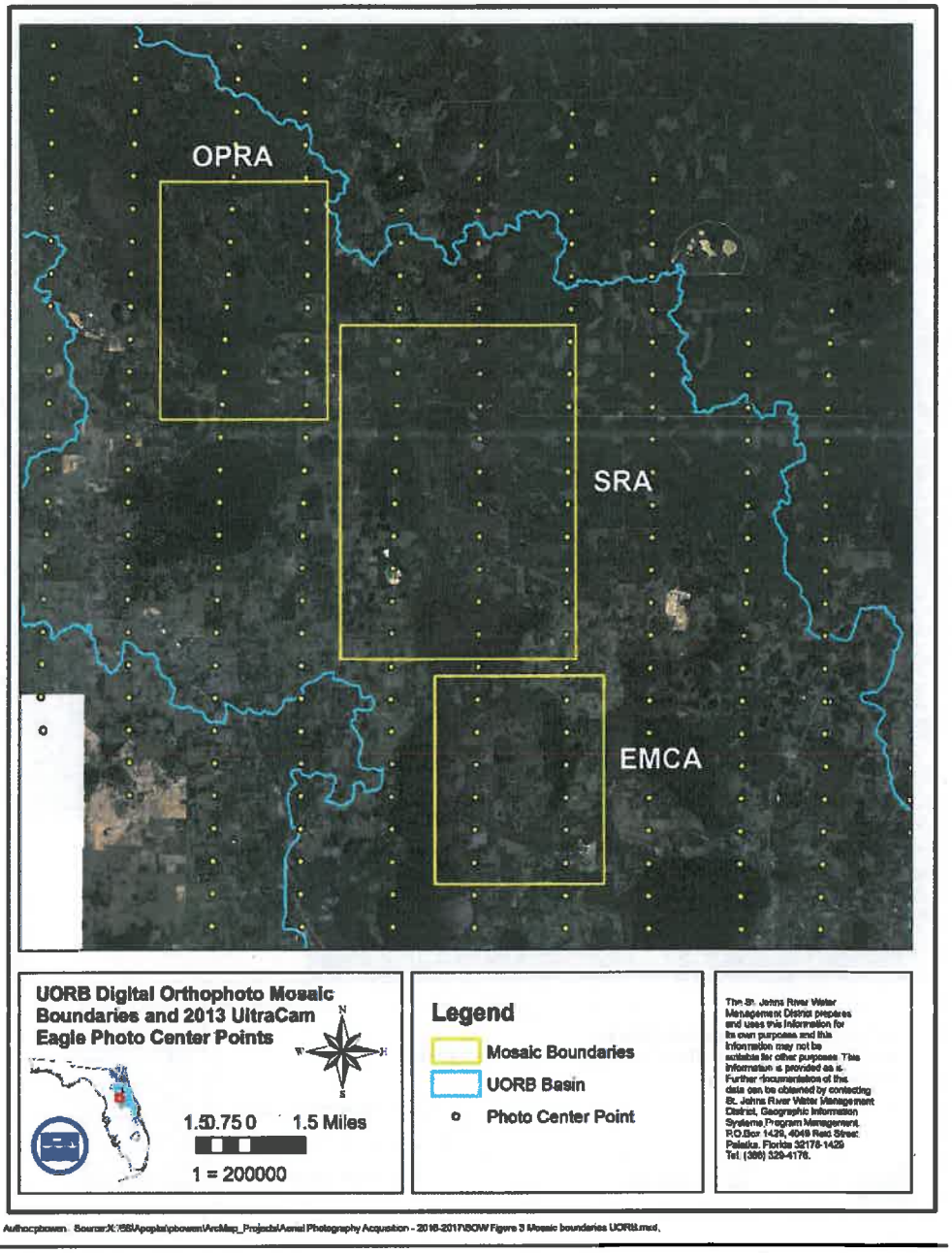

Figure 3. Boundaries for the digital mosaics that will be created from orthophotos for EMCA, OPRA, and SRA.

Vegetation Community Maps in the Lake Apopka Basin - The LANS, MFW, and Adjoining Properties and the Southern Half of Lake Apopka

The target area for this portion of the project is depicted in Figure 4 and includes the LANS, MFW, and adjoining properties in Orange and Lake counties, Florida, and the land use/land cover communities adjoining the southern half of Lake Apopka. The boundary identifying the vegetation mapping area for the LANS, MFW, and adjoining properties is outlined in red and includes approximately 26,500 acres. The area boundary for mapping land use/land cover on the southern half of Lake Apopka is outlined in green; land use/land cover in the lake and along the lake edge will be mapped within this boundary. The District will provide ArcGIS shapefiles for these areas.

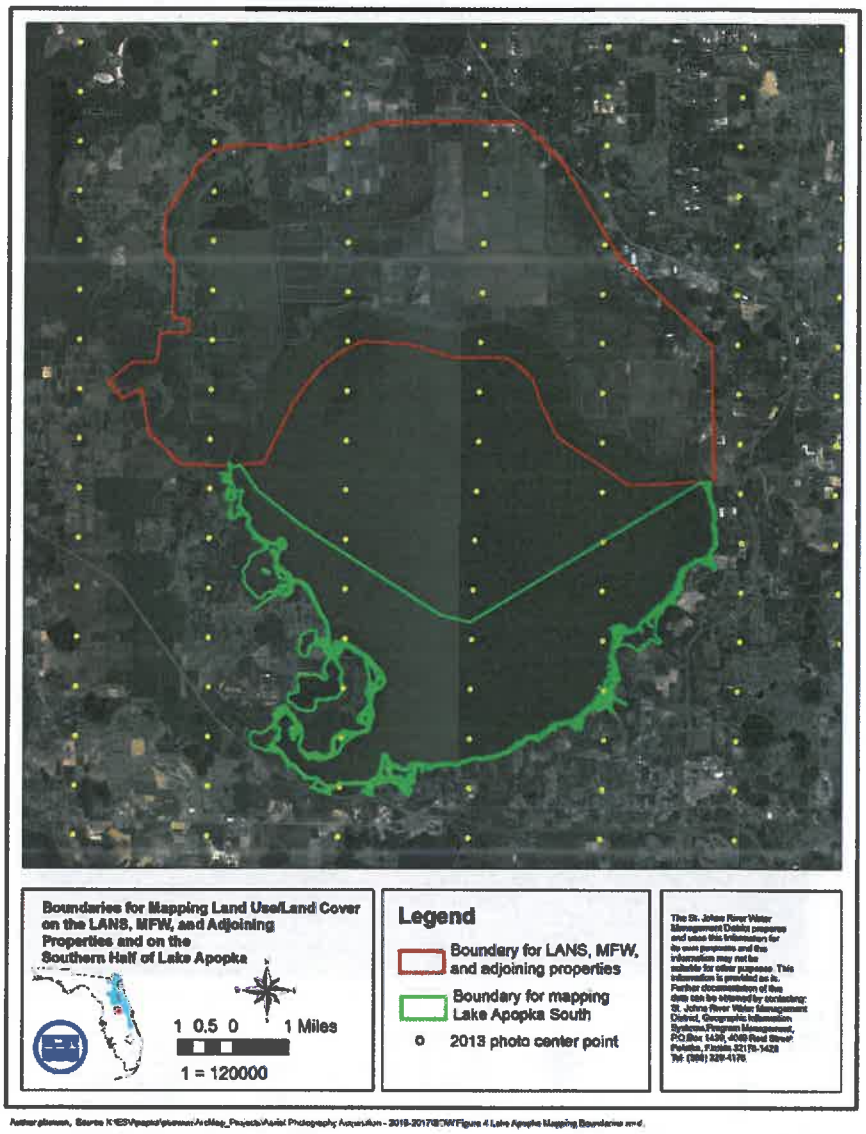

Figure 4. The boundary for vegetation community mapping on the LANS, MFW, and adjoining properties is outlined in red; the mapping area for mapping land use/land cover on the southern half of Lake Apopka is outlined in bright green.

Vegetation Communities in the Upper Ocklawaha River Basin - EMCA, OPRA, and SRA

The target area for this portion of the project is depicted in Figure 5. It includes EMCA, OPRA, and SRA in Lake and Marion counties, Florida. The 2016 boundaries identifying the vegetation mapping areas for each conservation/restoration area are outlined in red and include a total of approximately 9,000 acres in EMCA, 6,200 acres in OPRA, and 8,050 acres in SRA. OPRA and SRA have additional areas that will be mapped in 2016 that were not mapped in 2013. The District will provide ArcGIS shapefiles with the boundaries for the conservation/restoration areas and the resulting shapefiles from the last mapping project done in 2013.

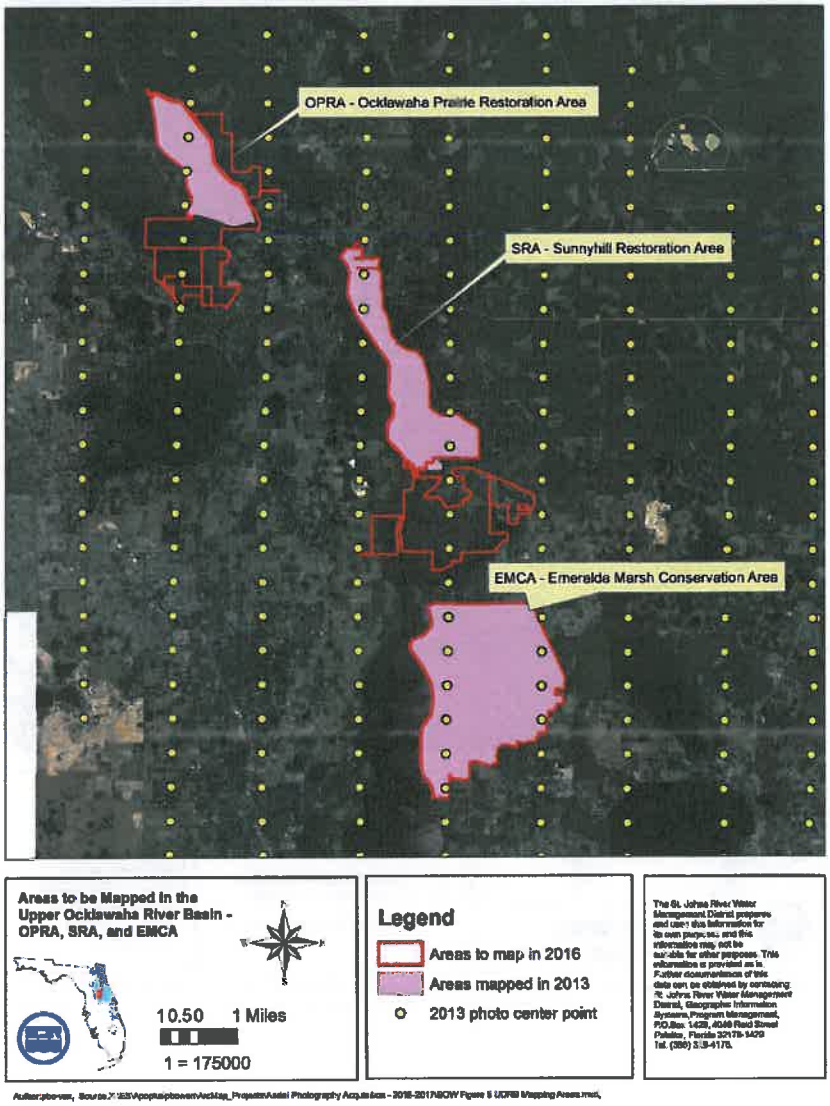

Figure 5. Boundaries for mapping EMCA, OPRA, and SRA in 2016 are outlined in red. The previous areas that were mapped on these properties in 2013 appear in pink.

The Contractor shall procure and/or provide the raw digital 4-band, 8-bit aerial photography in .tif format for this project. The Contractor shall provide the equipment and personnel necessary to orthorectify, mosaic, aero-triangulate, and post process the aerial photography images necessary to create the mosaics and to map the vegetation communities. The Contractor shall also provide the soft-copy stereoplotter, personnel, software, and other equipment necessary to create the ArcGIS file geodatabases of the vegetation communities. All Work shall be supervised and reviewed by a PSM meeting the minimum requirements under this solicitation. The District shall provide ArcGIS shapefiles for the boundaries depicted in this document and from previous vegetation mapping projects conducted on the LANS and in the Upper Ocklawaha River Basin in 2013. The District shall provide access and transportation on District property and shall assist the Contractor in groundtruthing vegetation signatures during the mapping process. The District shall also provide transportation on the southern half of Lake Apopka if groundtruthing is required.The District shall provide staff to review and comment on the accuracy of the ArcGIS files prior to their final acceptance. The Contractor shall provide the personnel and equipment necessary to prepare and finalize the annual report and the District shall review and comment on the report prior to its finalization.

IV. Task Identification

The project shall consist of the following tasks:

Task 1: Raw Digital Aerial Photography
Create or acquire raw digital aerial photography that meets the following specifications:

- Sensor: The imagery shall be acquired using either an UltraCamX or UltraCam Eagle or equivalent. The sensor/camera must acquire frame-based imagery.

- Bands and Radiometry: All imagery shall be acquired in four-band digital format. A 4-band stack including blue, green, red, and near infrared shall be delivered. Geometric misalignments between any of the bands will not be accepted. Raw imagery shall be processed so the images consist of a color and tone balanced radiometry.

- Ground Sample Distance (GSD): All raw imagery shall have a nominal ground sample distance not to exceed 0.9 feet.

- Coverage: Stereo imagery is to be created that is suitable for stereo viewing within a photogrammetric workstation. Stereo imagery shall be acquired utilizing a 60% forward overlap and a 30% side overlap. Overlap in the direction of the flight will average 60 percent, within 5 percent. Sidelap between over-lapping parallel flight lines of vertical photography shall average 30 percent. within 10 percent.

- Flight Line Direction: The flight lines shall be oriented in a north-south direction for efficiency of coverage and to minimize bi-directional illumination.

- Image Quality: Exposure shall be calibrated to the tree canopy or other vegetation features. Particular care shall be taken to avoid overexposure of areas dominated by open water – these areas must be exposed for the vegetation. The final imagery shall be free of noticeable vignetting and shall have minimum sun spot and washout. Ground features shall not be obscured by clouds, dense cloud shadows, or smoke.

- Mission Constraints: Weather conditions - Imagery shall be 100% free of smoke, clouds, cloud shadows and haze. Sun angle - All images shall be taken when the sun angle is greater than 30 degrees. Timing of aerial photography - All photography shall be obtained between January 1, 2017 and February 28, 2017. All photography shall be taken on a single day or on two contiguous days. E-mail

notification of the flight date shall be provided to the District's project manager within 24 hours after the flight:

Pam Bowen
Project Manager
PH: (386) 329-4870
pbowen@sjrwmd.com

- ABGPS and IMU Data: Data collection will require the use of an Airborne Global Positioning System and an Inertial Measurement Unit. The ABGPS/IMU data shall include ID, x, y, z, phi, kappa, and omega. The x and y coordinates shall be submitted in UTMs (Zone 17N) and the z coordinates shall be submitted in NAVD88. The ABGPS/IMU processing report showing a graphical comparison of forward versus reverse processing shall also be provided with the ABGPS/IMU data. Prior to demobilizing, the Contractor shall check to ensure that there are no gaps or missing values in the ABGPS/IMU data. The Contractor shall be responsible for planning the location of GPS base station locations. All ABGPS and IMU data are deliverables.
- The raw digital imagery files shall be processed and provided to the District's project manager for review on an external hard drive within seven to ten business days of the flight date.

Aerial Photography - Review of Raw Imagery
Within 14 business days of the flight date, the District's project manager and the Contractor shall jointly review the aerial photography raw images to determine if they meet the specifications outlined in Task 1 and to determine if they can be orthorectified and used for photointerpretation of vegetation. If they are acceptable for orthorectification and photointerpretation, the raw imagery shall be approved by the District's project manager. If the raw imagery is not approved by the District's project manager, frames shall be re-flown at no additional cost to the District.

Deliverables shall include raw digital imagery files in .tif format, the mission log, ABGPS and IMU data, center point data, a camera calibration report, and a hard-copy flight line map. The raw imagery files shall be delivered on an external hard drive. All of the other deliverable files for this task shall be delivered on duplicate DVDs.

Task 2: Digital Orthophotos and Mosaics (True-color, Infrared).
Contractor shall create individual orthophotos and two orthophoto mosaics, one true-color mosaic and one infrared mosaic, of each of the following properties from the raw digital aerial photography:

-LANS, MFW, and adjoining properties
-EMCA
-OPRA
-SRA

The specific areas of interest to be included in the digital orthophotos and the mosaics is identified in Figure 2 and 3. Existing digital terrain models (DTM) available from USGS shall be used for the orthorectification. The ground control used for aerotriangulation shall be obtained by the Contractor. Aerotriangulation shall be completed so that all resultant imagery and map products result in a horizontal accuracy as defined by USGS National Map Accuracy Standards (NMAS) for 1:24,000 scale maps. A metadata file shall be prepared that describes the processes used to orthorectify the imagery and to create the digital mosaics. The projection for these files shall be in UTMs for zone 17 north with a datum of NAD1983HARN (HPGN) and the units shall be in meters.

Individual digital orthophotos shall be stored and delivered as GeoTiff files (.tif and .tfw). The orthophotography mosaics shall be stored and delivered in Mr. SID format (.sid); these files shall include all of the imagery from the study areas in two mosaics, a true-color mosaic and an infrared mosaic. The files shall be delivered via duplicate DVDs or via an external hard drive. A metadata file that includes information on the processes used to create the orthophotos and the digital mosaics shall be delivered in .xml format on the same duplicate DVDs as the orthophoto and mosaic files or on the external hard drive.

Task 3: ArcGIS Mapping Files and Maps of the Lake Apopka Basin Areas.
Contractor shall create an ArcGIS file geodatabase in ESRI's 10.0 or 10.1 format and an ArcMAP project of the vegetation communities in the vegetation mapping and land use/landcover project boundaries using a soft-copy stereoplotter for photointerpretation.

- The areas of interest to be mapped are identified in Figure 4 and include:
  - The LANS and MFW and associated lake edge and adjoining areas along the north shore of Lake Apopka, such as the Apopka-Beauclair Canal and other District properties in the area
  - The southern half of Lake Apopka identified in Figure 4
- The District shall provide the ArcGIS shapefiles that appear in Figure 4 for the project boundaries.
- The geodatabase spatial reference and domain shall be imported from a template geodatabase provided by the District.
- All GIS, triangulated imagery, and orthophoto data produced for the project shall be delivered in the following format:

Item	Value
Projection	UTM
Zone	17 North
Datum	NAD83 HARN (HPGN)
Units	Meters
Spheroid	GRS1980

- The same legend shall be used for the vegetation communities layer that was used in the 2013 mapping project. The District shall provide a copy of the 2013 mapping files which will include a layer that utilizes this legend.
- The Contractor shall conduct up to 3 groundtruthing site visits with District staff per year.
- Vegetation classification shall be based on the St. Johns River Water Management District vegetation classification standard (APPENDIX 1). The following fields shall be included and populated in the file geodatabase based on the classification codes in the appendix:
  Veg – 40-character text field
  V – two-character text field
- The new undelineated imagery shall be compared to the shapefiles created from the 2013 imagery to ensure that changes are mapped accurately. The 2013 vegetation ArcGIS files shall be edited and used so that all of the line work does not have to be recompiled in areas where it has not changed since 2013. The Contractor shall ensure that differences between 2013 and 2016-2017 coverages represent true changes in vegetation communities.
- The minimum mapping unit for this project shall be 100 m^2 (10 m by 10 m).
- A minimum 85% thematic accuracy of interpretation of polygons representing a community type is necessary to meet District standards.
- Metadata for the vegetation layers shall be populated in the file geodatabase in a metadata format that complies with the federal metadata standard, Content Standard for Digital Geospatial Metadata (CSDGM), vers. 2 (FGDC-STD-001-1998) established by the Federal Geographic Data Committee (FGDC).

- A draft ArcGIS file geodatabase shall be submitted to the District for evaluation 45 days prior to the final delivery date for the deliverables for this task. The draft geodatabase will be reviewed by the District and comments will be returned to the Contractor within 30 days of submittal by the Contractor. The Contractor shall incorporate corrections into the final ArcGIS file geodatabase and the final report.

ArcGIS data delivery formats shall include the file geodatabase (.gdb) in ESRI's 10.0 or 10.1 format and map document file (.mxd). ArcGIS files shall be stored and delivered on a DVD. The DVD shall be produced and provided in duplicate and the hard copy maps, one of the LANS, MFW, and adjoining properties and one of the southern half of the lake, shall be provided in triplicate.

Task 4: ArcGIS Mapping Files and Maps of the Upper Ocklawaha River Basin Areas.
Create an ArcGIS file geodatabase in ESRI's 10.0 or 10.1 format and an ArcMAP project of the vegetation communities in the vegetation mapping and land use/landcover project boundaries using a soft-copy stereoplotter for photointerpretation.

- The areas of interest to be mapped are identified in Figure 5 and include:
  - EMCA
  - OPRA
  - SRA
- The District will provide the ArcGIS shapefiles that appear in Figure 5 for the project boundaries. The District will also provide shapefiles for all of these areas that were created during the last vegetation mapping project using 2013 imagery.
- The Contractor shall create the file geodatabases and the extent of the file geodatabases shall cover all of the 2013 shapefiles provided from the 2013 vegetation mapping project which were provided above by the District as well as the new areas to be mapped in 2016 in OPRA and SRA.
- All GIS, triangulated imagery, and orthophoto data produced for the project shall be delivered in the following format:

Item	Value
Projection	UTM
Zone	17 North
Datum	NAD83 HARN (HPGN)
Units	Meters
Spheroid	GRS1980

- The same legend shall be used for the vegetation communities layer that was used in Task 3. If that legend does not include all of the communities mapped in the Upper Ocklawaha River Basin, the District's project manager will work with the Contractor to select new symbology for the communities that are not included.
- The Contractor shall conduct up to 5 groundtruthing site visits with District staff per year.
- Vegetation classification shall be based on the St. Johns River Water Management District vegetation classification standard (APPENDIX 1). The following fields shall be included and populated in the file geodatabase based on the classification codes in the appendix:
  Veg – 40-character text field
  V – two-character text field
- The new undelineated imagery shall be compared to the shapefiles created from the 2013 imagery to ensure that changes are mapped accurately. The 2013 vegetation ArcGIS files shall be edited and used so that all of the line work does not have to be recompiled in areas where it has not changed since 2013. The Contractor shall ensure that differences between 2013 and 2016-2017 coverages represent true changes in vegetation communities. Note: OPRA and

SRA have new areas that were not mapped in 2013. They will need to be delineated directly from the new imagery

- The minimum mapping unit for this project shall be 100 m^2 (10 m by 10 m).
- A minimum 85% thematic accuracy of interpretation of polygons representing a community type is necessary to meet District standards.
- Metadata for the vegetation layer shall be populated in the file geodatabase in a metadata format that complies with the federal metadata standard, Content Standard for Digital Geospatial Metadata (CSDGM), vers. 2 (FGDC-STD-001-1998) established by the Federal Geographic Data Committee (FGDC).
- Draft ArcGIS file geodatabases shall be submitted to the District for evaluation 45 days prior to the final delivery date for each of the deliverables for this task. The draft geodatabases will be reviewed by the District and comments will be returned to the Contractor within 30 days of submittal by the Contractor. The Contractor shall incorporate corrections into the final ArcGIS file geodatabases and the final report.

ArcGIS data delivery formats shall include the file geodatabase (.gdb) in ESRI's 10.0 or 10.1 format and map document file (.mxd). ArcGIS files shall be stored and delivered on a DVD. The DVD shall be produced and provided in duplicate and the hard copy maps shall be provided in triplicate.

Task 5: Final Report.
Contractor shall report the results of this work using the following report format. The report shall consist of:

1. Introduction: Describe the origin of the study and include contract number.
2. Methods: Provide a detailed description of the methods used to acquire the aerial photography, to post-process the imagery, to georectify the imagery, to create the mosaics, and to delineate the vegetation classifications, and to create the maps.
3. Results: Provide a description of the mapping results, problems encountered, solutions to problems, and an assessment of map quality. The map quality assessment shall consist of measures of spatial and classification error. The results should also include, broken down by mapping area (LANS, south half of Lake Apopka, EMCA, OPRA, and STA), the total number of acres for each vegetation classification.
4. Appendices: The appendices shall include:
   -A list of the ground control points used in the project (including lat/longs for each point)
   -Aerotriangulation Summary Report and any reports generated from the aerial photography flight (including the mission log, ABGPS/IMU data, center points, and the camera calibration report)
   -Metadata - Include GIS specific information in a metadata format that complies with the federal metadata standard, Content Standard for Digital Geospatial Metadata (CSDGM), vers. 2 (FGDC-STD-001-1998) established by the Federal Geographic Data Committee (FGDC). Provide metadata for both the digital mosaic imagery and the ArcGIS vegetation communities feature class. (Refer to http://www.fgdc.gov/metadata/geospatial-metadata-standards).

Duplicate digital copies of the annual report shall be delivered in .doc format on separate CDs or DVDs. Three hard copies of the annual report shall also be provided to the District in separate binders.

V. Time Frames and Deliverables

Annual Mapping Mission Constraints: Contractor shall complete all work, Tasks 1 through 5, by September 30, 2018. This shall include the delivery of the raw digital imagery on an external hard drive; a hard copy flightline map, mission log, ABGPS/IMU data, center point data, and camera calibration report on duplicate sets of DVDs; the individual orthophotos, mosaics, and metadata files on duplicate DVDs; duplicate DVDs of the ArcGIS file geodatabases, ArcMap files, and metadata files; three hard copies of each ArcMap map for each mapping area; three hard copies of the annual report; and duplicate digital copies of the annual report on DVDs. All raw imagery, geo-referenced photography, and map materials shall become the property of the District.

List of Deliverables:

ITEM	DELIVERY METHOD	FORMATS
Raw Imagery	External hard drive	.tif
Mission Log	Duplicate DVDs	.doc or .pdf
ABGPS/IMU Data	Duplicate DVDs	ASCII, .xls, or .xlsx
ABGPS/IMU Processing Report	Duplicate DVDs	.doc
Camera Calibration Report	Duplicate DVDs	.pdf
Center Coordinates	Duplicate DVDs	.txt, .xls, or .xlsx
Flightline Map with Center Coordinates	Duplicate hard copies	
Orthophotos and Mosaics (2) for Each Mapping Unit	Duplicate DVDs (2 sets) or on an external hard drive	Individual Digital Orthophotos (.tif, .tfw)
LANS		Orthophoto Mosaics (.sid)
EMCA		Orthophoto Mosaic Metadata (.xml)
OPRA		
SRA		
ArcGIS Data for the	Duplicate DVDs (2 sets)	ArcGIS File Geodatabase (.gdb)
Lake Apopka Basin		Map Documents (.xmd)
		Metadata (.xml populated in the .gdb file)
Map Plots for the Lake Apopka Basin	Triplicate hard copy plots	Custom size: 25.5 in. tall x 34 in. wide One of the LANS, MFW, and adjoining areas and one of the southern half of Lake Apopka
ArcGIS Data for the	Duplicate DVDs (2 sets)	ArcGIS File Geodatabases (.gdb)
Upper Ocklawaha		Map Documents (.xmd)
River Basin		Metadata (.xml populated in the .gdb file)
Map Plots for the	Triplicate hard copy plots	Custom size: 34 in. tall x 25.5 in. wide
Upper Ocklawaha		
River Basin Properties		
Final Report	Duplicate DVDs (2 sets) and triplicate hard copy reports in binders	Microsoft WORD (.doc)

Deliverables and Time Frames: The deliverables for this project shall be completed as outlined below:

Deliverable **Due Date:**

Deliverable 1: Raw Digital Imagery and Accompanying Data and Reports **4/3/2017**
An external hard drive with all of the raw digital imagery files in .tif format
A duplicate set of DVDs with the mission log, ABGPS/IMU data, ABGPS/IMU processing report, camera calibration report, and center point coordinate file
Duplicate hard copy flight line maps with the center coordinates

Deliverable 2: Individual Orthophotos and Two Mosaics for Each Area
A duplicate set of DVDs of the GeoTiff individual digital orthophotos created from the aerial photographs in GeoTiff format
Duplicate DVDs of the digital orthophoto mosaics in Mr. SID format created from the individual orthophotos and the metadata file describing the processes used in their creation (Numerous .tif and .tfw files, two Mr. SID files and one .xml file)
The Contractor may provide these files on an external hard drive if desired.

Areas:	Lake Apopka, MFW, and Adjoining Properties	**6/1/2017**
	EMCA	**7/3/2017**
	OPRA	**8/1/2017**
	SRA	**9/1/2017**

Deliverable 3: Lake Apopka Basin ArcGIS Mapping Files and Maps **11/1/2017**
Duplicate hard copies of the ArcMap maps - one of the LANS, MFW, and adjoining properties and one of the southern half of Lake Apopka (Size: 25.5 in. tall x 34 in. wide) and a duplicate set of DVDs with the ArcGIS file geodatabase (.gdb) and the Map Document (.mxd) file

Deliverable 4: Upper Ocklawaha River Basin ArcGIS Mapping Files and Maps
Duplicate hard copies of the ArcMap maps (Size: 34 in. tall x 25.5 in. wide) and a duplicate set of DVDs with the ArcGIS file geodatabase (.gdb) and the Map Document (.mxd) files

Areas:	EMCA	**2/1/2018**
	OPRA	**5/1/2018**
	SRA	**8/1/2018**

Deliverable 5: Final Report **9/30/2018**
Three hard copies and duplicate digital copies on DVDs of the final report. Note: An electronic file of the DRAFT report shall be submitted to the DISTRICT for review exactly one month prior to the due date for this deliverable. For example, if this deliverable is due on 9/30/18, then the DRAFT shall be submitted to the District by 8/30/18. (.doc file)

Final Completion Date for Project **9/30/2018**

VI. Cost Schedule

TASK	TOTAL COST	COST BY FISCAL YEAR	
		FY 2017	FY2018
Task 1: Raw Digital Aerial Photography and QC	$ 26,793.77	$ 26,793.77	$ -
Task 2: Digital Orthophotos and Mosaics	$ 12,685.03	$ 12,685.03	$ -
Task 3: ArcGIS Mapping Files and Maps of the Lake Apopka Basin Areas	$ 33,612.54	$ 12,521.20	$ 21,091.34
Task 4: ArcGIS Mapping Files and Map of the Upper Ocklawaha River Basin Areas	$ 34,716.27	$ -	$ 34,716.27
Task 5: Final Report	$ 1,675.80	$ -	$ 1,675.80
GRAND TOTAL	$109,483.41	$52,000.00	$57,483.41

APPENDIX 1
St. Johns River Water District Vegetation Classification Standard

WETLANDS VEGETATION CLASSIFICATION SYSTEM

A unique classification system was developed for this project, with terms that are commonly used in this part of Florida. It provides classification at several levels (land form, community, species) into a single character string. For mapping purposes, only the code for the dominant vegetation community in a polygon will be used.

A copy of the wetlands vegetation key is attached below.

WETLAND DIAGNOSTIC CHARACTERISTICS

Unpublished Document- Palmer Kinser
St. Johns River Water Management District, P.O. Box 1429, Palatka, FL 32178-1429

FRESHWATER WETLANDS

Cypress (CY) - Forested wetlands dominated by bald cypress or pond cypress (*Taxodium distichum* or *T. ascendens*) and flooded annually for periods of long duration - typically 4 to 8 months in any given year. Includes cypress dome, stand, and lakeshore variants.

Hardwood Swamp (HS) - Forested wetlands dominated by one or more deciduous hardwood species typically including black gum, red maple, water ash, water elm, and willows. Cypress is often a significant component of this type. Subject to annual, seasonal periods of prolonged flooding.

Bayhead (BH) - Forested wetlands dominated by one or more species of broadleaved, evergreen bay trees (*Gordonia lasianthus*, *Persea palustris*, or *Magnolia virginica*). Dahoon holly (*Ilex cassine*) may occasionally be dominant. Soils usually organic and nearly constantly saturated as well as being at least occasionally flooded. The canopy of some sites may be dominated by pines, but bays and other indicators will be prevalent in the subcanopy and understory.

Baygall (BG) - Forested wetlands typically dominated by one or more species of evergreen bay trees or less commonly by dahoon holly, deciduous hardwoods, or pine. Located at the bases of sandy slopes and maintained by downslope seepage. Soils organic and nearly constantly saturated but infrequently flooded.

Hydric Hammock (HH) - Forested systems dominated by a mixture of broadleaved evergreen and deciduous tree species. Cabbage palmetto (CP) may be dominant in some variants of this type. Seldom inundated but with saturated soils during much of the year.

Bottomland Hardwoods (BL) - Deciduous forest communities lying in the floodplains of rivers and streams subject to rapid rise and fall of floodwaters. At other times, they may be relatively well drained, or at most, saturated by lateral seepage. Associated soils are alluvial.

Forested Flatwoods Depressions (FD) - Typically pond cypress, pine, deciduous hardwood, bay, or cabbage palm dominated communities occupying shallow depressions in mesic flatwoods sites. Understory vegetation consists of hydrophytic shrubs, grasses, and herbs. Saw palmetto, gallberry and other typical mesic flatwoods species generally absent. In the absence of fires, or as a result of forest management

practices, understory or associated species (such as loblolly bay) may dominate these sites. Soils usually sandy and subject to brief (1 - 2 months) seasonal inundation or prolonged soil saturation.

Shrub Swamp (SS) - Dominated by willows, buttonbush, or similar appearing vegetation. Hydrology similar to that of cypress, hardwood swamp, or shallow marsh communities.

Shrub Bog (SB) - Dominated by shrubby vegetation occupying typical bayhead sites. Often developing in bayheads destroyed by fire or other disturbance. Hydrology similar to that of bayhead communities.

Shrubgall (SG) - Wetlands dominated by shrubby vegetation occupying typical baygall sites and having similar hydrologies and soils.

Transitional Shrub (TS) - Dominated by transitional shrubby vegetation at upland margins of wetter community types or on clear cut hydric sites. Also develops on wet prairie sites that have been protected from fire. Wax myrtle (*Myrica cerifera*) and *Baccharis halimnifolia* are typical species.

Deep Marsh (DM) - Deep water wetlands dominated by a mixture of water lilies and deep water emergent species. Semi-permanently to permanently flooded. Typical genera include: *Scirpus*, *Nymphaea*, *Nuphar*, *Nelumbo*, *Brasenia* and *Nymphoides*.

Lakeshore Emergents (DM-LS) - Emergent vegetation growing along lake shores and usually semi-permanently flooded. *Panicum hemitomon* and species of *Scirpus* are most common.

Water Lilies (DM-N) - Floating leaved species in the genera *Nymphaea*, *Nuphar*, *Nelumbo*, *Brasenia* and *Nymphoides*. Usually semi-permanently to permanently flooded.

Shallow Marsh (SM) - Herbaceous or graminoid communities dominated by species such as sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), cattails (*Typha* spp.), pickerel weed (*Pontederia cordata*), arrowhead (*Sagittaria* spp.), or other grasses and broad-leaved herbs. Occurs most often on organic soils that are subject to lengthy seasonal inundation. Subject to occasional fire.

Wet Prairie (WP) - Communities of grasses, sedges, rushes, and herbs typically dominated by sand cordgrass (*Spartina bakeri*), maidencane (*Panicum hemitomon*), or a mixture of species. Usually on mineral soils that are inundated for a relatively short duration each year, but with prolonged soil saturation. Subject to frequent fire.

Floating Marshes (FF) - Communities of free-floating plants, such as, water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), and/or duckweed (*Lemna*, *Spirodella*); or floating mats of rhizomatous/stoloniferous species, such as, alligator weed (*Alternanthera philoxeroides*), pennywort (*Hydrocotyle* spp.); or various graminoids, such as *Paspalum* spp. and sedges.

Submerged Aquatic Beds (AB) - Communities of aquatic plants rooted in the sediments of shallow water bodies and having the majority of their photosynthetic tissues below the water surface. Generally permanently flooded. Typical species include: eelgrass (*Valisneria Americana*) and southern naiad (*Najas guadalupensis*).

Freshwater Flats and Barren Areas (BA) - Sandy or muddy sites subject to occasional or regular inundation with less than 33% vegetation cover during the growing season.

Shoreline and Beach (BE) - Non-vegetated sites occupying slopes exposed to periodic inundation, and wave action. Typically bordering open water areas and transitional to upland coastal dunes and scrub communities.

Water (W) - Unvegetated or sparsely vegetated sites subject to prolonged or semi-permanent flooding. Includes lakes, streams, ponds and other water bodies.

UPLANDS

UPLANDS (U) - Used for all areas that are not delineated as wetlands vegetation. May include drained areas, developed or farmed lands, and pine plantations on hydric soils. Hydrology may be xeric, mesic, or hydric.

Dry prairie (DP) – Upland community dominated by graminoids, such as, wiregrass (*Aristida stricta*) and/or saw palmetto (*Serenoa repens*).

Dry Shrub (DS) – Upland community dominated by shrubs, such as, saw palmetto (*Serenoa repens*) or saltbush (*Baccharis halimifolia*).

ANTHROPOGENIC

Used for sites that are associated with urban, suburban, rural human activities.

Road (RD) – Road, paved or unpaved.

Levee (LV) – Structure surrounding "impoundments". May appear as a road, but should be defined based on the internal landuse/landcover.

Farm (FA) – Row crop agriculture other than muck farm.

Muck Farm (MU) – Row crop agriculture with dominance by histosol soil.

Sod Farm (SF) – Sod (turf) farm with intensively managed areas of short, uniform turf. May include ponds for irrigation and drainage ditches. Unlike pastures, features such as cattle or hay bales are absent.

Pasture (PA) – Agriculture or lawn dominated by pasture grasses, such as, bahiagrass (*Paspalum notatum*).

Building (BD) – Buildings large enough to meet the minimum mapping unit.

Parking Lot (PL) – Paved or unpaved parking lot.

Spoil (SP) – Piles of sand or limerock.

Fallow Cropland (FC) – Harvested agricultural land not currently in crop production. At Lake Apopka, these lands were previously farmed and have been mechanically maintained (mowed) so they do not transition into natural habitat. They are characterized by shortly cropped or non-woody vegetation.

Residential Development (RE) - Includes areas consisting of residential structures and the surrounding property, roads, and other improvements associated with those structures. This includes low and medium

density single family houses as well as high density multi-family apartments, condominiums, or trailer parks, the sidewalks and roads serving them, and the landscape surrounding them.

Commercial and Industrial Development (CI) - Includes areas consisting of commercial and industrial structures and the surrounding property, roads, and other improvements associated with those structures. This includes low, medium, and high density commercial structures as well as industrial structures, the sidewalks, parking lots, and roads serving them, and the landscape surrounding them.

Municipal and Governmental Development (MG) - Includes areas consisting of municipal and governmental structures and the surrounding property, roads, and other improvements associated with those structures. This includes low, medium, and high density municipal and governmental development as well as public boat ramps and docks, parks, parking lots, playgrounds, and the roads serving them and the landscape surrounding them.

ATTACHMENT B - INSURANCE REQUIREMENTS

Contractor shall acquire and maintain until completion of the Work the insurance coverage listed below, which constitutes primary coverage. Contractor shall not commence the Work until the District receives and approves Certificates of Insurance documenting required coverage. Contractor's General Liability policy shall include Endorsement CG 20101185, or equivalent, naming the St. Johns River Water Management District ("District") as Additional Insured. All required policies shall include: (1) endorsement that waives any right of subrogation against the District for any policy of insurance provided under this requirement or under any state or federal worker's compensation or employer's liability act; (2) endorsement to give the District no less than thirty (30) days notice in the event of cancellation or material change. Certificates of Insurance must be accompanied by copies of the requested endorsements.

Any deductibles or self-insured retentions above $100,000 must be declared to and approved by the District. Approval will not be unreasonably withheld. Contractor is responsible for any deductible or self-insured retention. Insurance must be placed with insurers having an A.M. Best rating of A-V or greater. District receipt of insurance certificates providing less than the required coverage does not waive these insurance requirements.

(a) **Workers' Compensation Insurance.** Workers' compensation and employer's liability coverage, including maritime workers compensation, if applicable, in not less than the minimum limits required by Florida law. If Contractor claims an exemption from workers' compensation coverage, Contractor must provide a copy of the Certificate of Exemption from the Florida Division of Workers' Compensation for all officers or members of an LLC claiming exemption who will be participating in the Work. In addition, Contractor must provide a completed District "Affidavit (Non-Construction)" for non-construction contracts. Contractor is solely responsible for compliance with any Federal workers' compensation laws such as Jones Act and USL&H Act, including any benefits available to any workers performing work on this project.

(c) **General Liability.** Commercial General Liability Insurance on an "Occurrence Basis," with limits of liability not less than $1,000,000/$2,000,000, for personal injury, bodily injury, and property damage. Coverage shall include: (1) contractual liability, (2) products and completed operations, (3) independent contractors, and (4) property in the care, control, or custody of the Contractor. Extensions shall be added or exclusions deleted to provide the necessary coverage.

(d) **Automobile Liability.** Minimum limits of $100,000/$300,000/$50,000

(e) **Professional Liability**. (per claim) $1,000,000 single limits.

(f) **Aircraft Liability.** Minimum coverage of $1,000,000 per occurrence. Combined Single Limit, for bodily injury (including passenger liability) and property damage.

ATTACHMENT C — DISTRICT'S SUPPLEMENTAL INSTRUCTIONS (sample)

DISTRICT SUPPLEMENTAL INSTRUCTIONS #

DATE:

TO:

FROM: , Project Manager

CONTRACT/PURCHASE ORDER NUMBER:

CONTRACT TITLE:

The Work shall be carried out in accordance with the following supplemental instruction issued in accordance with the Contract Documents without change in the Contract Sum or Contract Time. Prior to proceeding in accordance with these instructions, indicate your acceptance of these instructions for minor changes to the work as consistent with the Contract Documents and return to the District's Project Manager.

1. CONTRACTOR'S SUPPLEMENTAL INSTRUCTIONS:

2. DESCRIPTION OF WORK TO BE CHANGED:

3. DESCRIPTION OF SUPPLEMENTAL INSTRUCTION REQUIREMENTS:

Contractor's approval: (choose one of the items below):

Approved: _____ Date: _____

(It is agreed that these instructions shall not result in a change in the Total Compensation or the Completion Date.)

Approved: _____ Date: _____

(Contractor agrees to implement the Supplemental Instructions as requested, but reserves the right to seek a Change Order in accordance with the requirements of the Agreement.)

Approved: _____ Date: _____
, District Project Manager

Acknowledged: _____ Date: _____
, District Contracts Administrator

cc: Contract/Purchasing file
Financial Management

SURVEYING SERVICES AGREEMENT
BETWEEN THE
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
AND THE SANBORN MAP COMPANY, INC.
FOR AERIAL IMAGERY ACQUISITION AND PLANT COMMUNITY
MAPPING IN THE FLOODPLAIN OF THE UPPER ST. JOHNS RIVER

THIS AGREEMENT is entered into by and between the GOVERNING BOARD of the ST. JOHNS RIVER WATER MANAGEMENT DISTRICT (the "District"), whose address is 4049 Reid Street, Palatka, Florida 32177, and THE SANBORN MAP COMPANY, INC. ("Surveyor"), whose address is 1935 Jamboree Drive, Suite 100, Colorado Springs, Colorado 80920-5358. All references to the parties hereto include the parties, their officers, employees, agents, successors, and assigns.

In consideration of the payments hereinafter specified, Surveyor agrees to furnish and deliver all materials and perform all labor required for aerial imagery acquisition and plant community mapping in the floodplain of the Upper St. Johns River (the "Work"). In accordance with RFQ Number 28099, Surveyor shall complete the Work in conformity with this Agreement, which consists of and incorporates all of the following documents: (1) advertisement for or qualifications; (2) Instructions to Respondents; (3) Special Instructions to Respondents; (4) addenda; certifications, and affidavits; (5) qualifications submittal; (6) Agreement, including the Statement of Work, and any Special Conditions or other attachments; (7) Plant Community Classification and Codes 2015-2017 USJRB Mapping Project (Exhibit 1); (8) Surveyor's Quality Control Plan (Exhibit 2); (9) Surveyor's Work Plan (Exhibit 3), and (9) Surveyor's Billing Schedule (Exhibit 4). If any provision in the body of this Agreement conflicts with any attachment hereto, the body of this Agreement shall prevail. This Agreement, including attachments, shall take precedence over all solicitation documents (items 1 – 4). The parties hereby agree to the following terms and conditions.

1. **TERM OF AGREEMENT**

   (a) The term of this Agreement shall be from the Effective Date to the Completion Date. Time is of the essence for each and every aspect of this Agreement. Where additional time is allowed to complete the Work, the new time limit shall also be of the essence. Notwithstanding specific mention that certain provisions survive termination or expiration of this Agreement, all provisions of this Agreement that by their nature extend beyond the Completion Date survive termination or expiration hereof.

   (b) **Effective Date.** The Effective Date is the date upon which the last party to this Agreement has dated and executed the same.

   (c) **Completion Date.** The Completion Date of this Agreement is April 1, 2018, unless extended by mutual written agreement of the parties. The Work shall be completed for use no later than said date.

2. **COMMENCEMENT OF WORK.** Surveyor shall commence the Work within 15 days after the Effective Date. This date shall be known as the "Commencement Date." Surveyor shall prosecute the Work regularly, diligently, and uninterruptedly so as to complete the Work ready for use in accordance with the Statement of Work and the time for completion stated therein. Surveyor shall not commence the Work until any required submittals are received and approved.

3. **DELIVERABLES**

   (a) The Work is specified in the Statement of Work, Attachment A. Surveyor shall deliver all products and deliverables as stated therein, and shall correct errors or omissions without additional compensation. In addition to hard copies, all written deliverables (reports, papers, analyses, etc.) shall be submitted in machine readable formats consistent with the District's standard software products, which include the Microsoft® Office Suite (Word, Excel, Access, and PowerPoint). Other formats may be accepted if approved by the District's Project Manager. If the Statement of Work does not include assistance in litigation undertaken or defended by the

District, Surveyor agrees to testify and assist the District in any such litigation that is dependent upon or related to the Work, except suits or claims between the parties, at the hourly rate provided in the Statement of Work. This obligation shall survive termination or expiration of this Agreement.

(b) Surveyor is responsible for the professional quality, technical accuracy, and timely completion of the Work. Both workmanship and materials shall be of good quality. Surveyor shall, if required, furnish satisfactory evidence as to the kind and quality of materials provided. Unless otherwise specifically provided for herein, Surveyor shall provide and pay for all materials, labor, and other facilities and equipment necessary for performance of the Work. The District's Project Manager shall make a final acceptance inspection of the deliverables when completed and finished in all respects.

(c) If not otherwise addressed in the Statement of Work, upon written request, Surveyor shall submit written progress reports to the District's Project Manager at the frequency requested in a form approved by the Project Manager at no additional cost to the District. The progress report shall provide an updated progress schedule, taking into account all delays and approved changes in the Work. Failure to provide a progress report will be cause to withhold payment.

4. **OWNERSHIP OF DELIVERABLES**

(a) All deliverables, including Work not accepted by the District, are District property when Surveyor has received compensation therefor, in whole or in part. For any Work subject to patent, copyright, such Work is a "work made for hire" as defined by the patent and copyright laws of the United States. Surveyor shall not make any representation otherwise and, upon request, shall sign any documents so affirming. Any District source documents or other District or non-District documents, specifications, materials, reports, or accompanying data developed, secured, or used in the performance of the Work, excluding proprietary materials, as outlined in the Statement of Work, are District property and shall be safeguarded and provided to the District upon request. District plans and specifications shall not be used on other work and, with the exception of the original plans and specifications, shall be returned to the District upon request. This obligation shall survive termination or expiration of this Agreement.

(b) The District shall have the unrestricted right to use and disseminate all of the above-referenced documents without payment of further compensation to Surveyor, provided that any future use for other than the purpose intended by this Agreement shall be at the District's sole risk and without liability to Surveyor. Surveyor shall include language in all subcontracts clearly indicating that ownership and copyright to all materials produced pursuant to this Agreement remains with the District or Surveyor, as provided herein. All original sketches, tracings, drawings, computation details, calculations, field books and plans that result from the Work shall become the sole property of the District. Surveyor shall submit all such work products to the District, if requested. Surveyor may retain copies of all work products created pursuant to this Agreement.

5. **FUNDING OF AGREEMENT**

(a) For satisfactory performance of the Work, the District agrees to pay Surveyor $425,000 (the "Total Compensation"). Funding for each applicable fiscal year is subject to District Governing Board budgetary appropriation. The parties may agree in writing to re-allocate funding from the amounts described below.

The amount expended hereunder shall be paid in accordance with and subject to the following multi-year funding allocations for each District fiscal year:

Fiscal Year: January 15, 2014 – September 30, 2015 ..... Amount: $ 125,000
Fiscal Year: October 1, 2015 – September 30, 2016 ..... Amount: $ 130,000
Fiscal Year: October 1, 2016 – September 30, 2017 ..... Amount: $ 130,000
Fiscal Year: October 1, 2017 – April 1, 2018 ..... Amount: $ 40,000

Funding for each applicable fiscal year is subject to District Governing Board budgetary appropriation.

(b) **Annual budgetary limitation.** For multi-fiscal year agreements, the District must budget the amount of funds that will be expended during each fiscal year as accurately as possible. The Statement of Work, Attachment A, includes the parties' current schedule for completion of the Work and projection of expenditures on a fiscal year basis (October 1 – September 30) ("Annual Spending Plan"). If Surveyor anticipates that expenditures will exceed the budgeted amount during any fiscal year, Surveyor shall promptly notify the District's Project Manager and provide a proposed revised work schedule and Annual Spending Plan that provides for completion of the Work without increasing the Total Compensation. The last date for the District to receive this request is August 1 of the then-current fiscal year. The District may in its sole discretion prepare a District Supplemental Instruction Form incorporating the revised work schedule and Annual Spending Plan during the then-current fiscal year or subsequent fiscal year(s).

6. **PAYMENT OF INVOICES**

(a) Surveyor shall submit Delivery itemized invoices by one of the following two methods: (1) by mail to the St. Johns River Water Management District, Finance Director, 4049 Reid Street, Palatka, Florida 32177, or (2) by e-mail to acctpay@sjrwmd.com. Each invoice shall be submitted in detail sufficient for proper pre-audit and post-audit review. If necessary for audit purposes, Surveyor shall provide additional supporting information as required to document invoices.

(b) **End of District Fiscal Year Reporting.** The District's fiscal year ends on September 30. Irrespective of the invoicing frequency, the District is required to account for all encumbered funds at that time. When authorized under the Agreement, submittal of an invoice as of September 30 satisfies this requirement. The invoice shall be submitted no later than October 30. If the Agreement does not authorize submittal of an invoice as of September 30, Surveyor shall submit, prior to October 30, a description of the additional Work completed between the last invoice and September 30, and an estimate of the additional amount due as of September 30 for such Work. If there have been no prior invoices, Surveyor shall submit a description of the Work completed on the project through September 30 and a statement estimating the dollar value of that Work as of September 30.

(c) **Final Invoice.** The final invoice must be submitted no later than 45 days after the Completion Date; provided, however, that when the Completion Date corresponds with the end of the District's fiscal year (September 30), the final invoice must be submitted no later than 30 days after the Completion Date. **Final invoices that are submitted after the requisite date shall be subject to a penalty of ten percent of the invoice. This penalty may be waived by the District, in its sole judgment and discretion, upon a showing of special circumstances that prevent the timely submittal of the final invoice. Surveyor must request approval for delayed submittal of the final invoice not later than ten days prior to the due date and state the basis for the delay.**

(d) All invoices shall include the following information: (1) District contract number; (2) District encumbrance number; (3) Surveyor's name and address (include remit address, if necessary); (4) Surveyor's invoice number and date of invoice; (5) District Project Manager; (6) Surveyor's Project Manager; (7) supporting documentation as to cost and/or project completion (as per the cost schedule and other requirements of the Statement of Work; (8) Progress Report (if required); (9) Diversity Report (if otherwise required herein). Invoices that do not correspond with this paragraph shall be returned without action, stating the basis for rejection. Payment shall be made within 45 days of receipt of an approved invoice. Disputes regarding invoice sufficiency are resolved pursuant to the dispute resolution procedure of this Agreement.

(e) **Travel expenses.** If the cost schedule for this Agreement includes a line item for travel expenses, travel expenses shall be drawn from the project budget and are not otherwise compensable. If travel expenses are not included in the cost schedule, they are a cost of

providing the service that is borne by Surveyor and are only compensable when specifically approved by the District as an authorized District traveler. In such instance, travel expenses must be submitted on District or State of Florida travel forms and shall be paid pursuant to District Administrative Directive 2000-02.

(f) **Payments withheld.** The District may withhold or, on account of subsequently discovered evidence, nullify, in whole or in part, any payment to such an extent as may be necessary to protect the District from loss as a result of: (1) defective Work not remedied; (2) failure of Surveyor to make payments when due to subcontractors or suppliers for materials or labor; (3) failure to maintain adequate progress in the Work; (4) damage to another Surveyor; or (5) any other material breach of this Agreement. Amounts withheld shall not be considered due and shall not be paid until the ground(s) for withholding payment have been remedied.

(g) **Payments.** The District shall pay Surveyor 100% of each approved invoice.

7. **PAYMENT AND RELEASE.** Upon satisfactory completion of the Work, the District will provide Surveyor a written statement accepting all deliverables. Surveyor's acceptance of final payment shall constitute a release in full of all Surveyor claims against the District arising from the performance of this Agreement, with the exception of any pending claims for additional compensation that have been documented and filed as required by this Agreement.

8. **INDEMNIFICATION.** Surveyor shall indemnify and hold harmless, release, and forever discharge the District, its public officers, employees, agents, representatives, successors, and assigns, from any and all liabilities, damages, losses, and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Surveyor, its employees or sub-Surveyors, in the performance of the Work and resulting from damages to property, personal injury, or loss of life.

9. **INSURANCE.** Surveyor shall acquire and maintain all insurance required by Attachment B, Insurance Requirements, and shall not commence Work until it has provided Certificates of Insurance to the District as per Attachment B. Receipt of Certificates of Insurance indicating less coverage than required does not constitute a waiver of the Insurance Requirements. Surveyor waives its right of recovery against the District to the extent permitted by its insurance policies. Surveyor's insurance shall be considered primary, and District insurance shall be considered excess, as may be applicable to Surveyor's obligation to provide insurance.

10. **FUNDING CONTINGENCY.** This Agreement is at all times contingent upon funding availability, which may include a single source or multiple sources, including, but not limited to: (1) ad valorem tax revenues appropriated by the District's Governing Board; (2) annual appropriations by the Florida Legislature, or (3) appropriations from other agencies or funding sources. Agreements that extend for a period of more than one Fiscal Year are subject to annual appropriation of funds in the sole discretion and judgment of the District's Governing Board for each succeeding Fiscal Year. Should the Work not be funded, in whole or in part, in the current Fiscal Year or succeeding Fiscal Years, the District shall so notify Surveyor and this Agreement shall be deemed terminated for convenience five days after receipt of such notice, or within such additional time as the District may allow. For the purpose of this Agreement, "Fiscal Year" is defined as the period beginning on October 1 and ending on September 30.

11. **PROJECT MANAGEMENT AND PERSONNEL**

(a) The Project Managers listed below shall be responsible for overall coordination and management of the Work. Either party may change its Project Manager upon ten business days prior written notice to the other party. Written notice of change of address shall be provided within five business days. All notices shall be in writing to the Project Managers at the addresses below and shall be sent by one of the following methods: (1) hand delivery; (2) U.S. certified mail; (3) national overnight courier; (4) e-mail or, (5) fax. Notices via certified mail are deemed delivered upon receipt. Notices via overnight courier are deemed delivered one business

day after having been deposited with the courier. Notices via e-mail or fax are deemed delivered on the date transmitted and received.

DISTRICT	SURVEYOR
Kimberli Ponzio, Project Manager	Krysia Sapeta, Project Manager
St. Johns River Water Management District	The Sanborn Map Company, Inc.
4049 Reid Street	1935 Jamboree Drive, Suite 100
Palatka, Florida 32177	Colorado Springs, Colorado 80920-5358
Phone: (386) 329-4331	Phone: (321) 613-2809
E-mail: kponzio@sjrwmd.com	E-mail: ksapeta@sanborn.com

(b) The District's Project Manager shall have sole responsibility for transmitting instructions, receiving information, and communicating District policies and decisions regarding all matters pertinent to performance of the Work.

(c) Surveyor shall maintain an adequate and competent professional staff. Surveyor's employees, subcontractors, or agents shall be properly trained to meet or exceed any specified licensing, training and/or certification applicable to their profession. Upon request, Surveyor shall furnish proof thereof.

12. **PROGRESS REPORTING; FAILURE TO MEET SCHEDULE**

(a) **Progress Reports.** Surveyor shall provide to the District update/status reports as provided in the Statement of Work. Reports will provide detail on progress of the Work and outline any potential issues affecting completion or the overall schedule. Reports may be submitted in any form agreed to by District's Project Manager and Surveyor, and may include emails, memos, and letters.

(b) **Progress Meetings.** The District may conduct progress meetings with Surveyor on a frequency to be determined by the District. In such event, Surveyor shall make available its Project Manager and/or superintendent and other appropriate personnel to discuss matters pertinent to the Work.

(c) **Failure to Meet Schedule.** If progress of the Work falls ten days or more behind the approved schedule, except as a result of District-approved delays, Surveyor shall take all necessary steps to augment the work effort to get the project back on schedule. Should the progress of the Work fall 15 days or more behind the approved schedule, the District may advise Surveyor through a "cure" notice that this Agreement is subject to termination for cause if the failure is not cured within 30 days of said notice. The District, at its discretion, may grant additional cure time.

13. **DELAYS.** Surveyor shall not be compensated for delays in the Work caused by Surveyor's inefficiency, rework made necessary by Surveyor's error, failure to perform the Work as scheduled, or any other corrective or productivity measures made necessary by errors, omissions, or failures to properly perform the Work. Within ten days after the onset of a delay, Surveyor shall notify the District in writing of the delay, which shall provide: (1) a detailed description the delay and its probable duration, (2) the specified portion of the Work affected, and (3) an opinion as to the cause of the delay and liability (if any) for the delay. Notices provided more than ten days after inception of the delay shall only be effective as to additional costs or delay incurred during the ten-day period preceding receipt of such notice. In the case of continuing delay for the same cause, only one notice of delay is necessary. If the delay is due to causes beyond Surveyor's control, as determined by the District in its sole judgment and discretion, the District may grant a time extension in the form of a written amendment signed by both parties.

14. **AMENDMENTS.** The parties may not amend this Agreement except in writing. Modifications that alter, add to, or deduct from the Work, or otherwise modify the terms of this Agreement, shall be implemented through a change order or formal amendment, specifying the nature of the change and any associated change in the Total Compensation and/or Completion Date. The District's Project Manager may also issue a District Supplemental Instruction (DSI) form (Attachment C) to authorize minor adjustments to the Work that are consistent with the purpose of the Work. Both parties must

sign the DSI. A DSI may not be used to change the Total Compensation, quantity, quality or the Completion Date of the Work, or to change or modify the Agreement..

15. **TERMINATION AND SUSPENSION**

(a) **District Termination For Cause.** This Agreement may be terminated by the District for cause on ten days written notice in the event of any breach hereof, including, but not limited to, Surveyor's: (1) failing to carry forward and complete the Work; (2) failing to comply with applicable laws, regulations, permits, or ordinances; (3) failing to timely commence or continuously and vigorously pursue correction of defective Work; (4) failing to make payments when due to subcontractors, vendors, or others for materials or labor used in the Work; or (5) making a material misrepresentation to the District regarding the Work. Upon termination, the District may take possession of the Work and finish the Work by whatever method(s) the District deems expedient. The remedy enumerated herein is non-exclusive. The District may avail itself of any statutory and/or common law remedy not specifically set forth herein.

(b) **District Termination for Convenience.** Notwithstanding any other provision hereof, the District may at any time terminate this Agreement, or any portion of the Work, without cause, upon 30 days written notice to Surveyor. In such event, Surveyor shall be compensated for any Work performed prior to the date of termination and for materials that were ordered prior to receipt of notice of termination that cannot be returned to the vendor, which shall become District property. Upon receipt of notice, Surveyor shall discontinue the Work on the date and to the extent specified therein and shall place no further orders for materials, equipment, services, or facilities, except as needed to continue any portion of the Work not terminated. Surveyor shall also make every reasonable effort to cancel, upon terms satisfactory to the District, all orders or subcontracts related to the terminated Work. Surveyor may not claim any compensation not specifically provided for herein, including, but not limited to: loss of anticipated profits; idle equipment, labor, and facilities; and any additional claims of subcontractors and vendors.

(c) **District Suspension for Convenience.** The District may direct Surveyor to stop Work, in whole or in part, whenever the District, in its sole judgment and discretion, determines that such stoppage is necessary to ensure proper completion of the Work, avoid injury to third persons, or otherwise meet the District's objectives. The District shall provide Surveyor not less than five days written notice, except in an emergency. Surveyor shall immediately comply with such notice. Should such stoppage increase Surveyor's cost, an equitable adjustment will be made by Change Order. The notice shall be effective until rescinded in writing, unless the period of suspension is stated in the notice.

(d) **Surveyor's Right to Terminate Agreement.** Surveyor may terminate this Agreement if the District fails to pay undisputed and adequately documented sums when due hereunder. In such event, Surveyor shall provide the District no less than ten days prior written notice of its intention to terminate this Agreement and afford the District an opportunity to cure the grounds for termination within said period. In any other event, dispute, or other matter arising under this Agreement, Surveyor shall fully perform the Work in accordance with the District's written instructions and may claim additional compensation as a Change Order, subject to the dispute resolution procedure.

ADDITIONAL PROVISIONS
(In Alphabetical Order)

16. **DEFINITIONS**

ADDENDA: Written or graphic instruments issued prior to the opening of Bids, which make additions, deletions, or revisions to the solicitation or contract documents.

AGREEMENT: The written contract between the District and Surveyor covering the Work, which includes all documents attached to this Agreement or incorporated herein by reference. The words "contract" and "Agreement" are synonymous in these documents.

AMENDMENT: Any written change made to the terms and conditions of the Agreement.

BUSINESS DAY: Monday through Friday, excepting those holidays observed by the District – New Years Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving (and Friday), and Christmas.

CHANGE ORDER: A written agreement of the parties after the Commencement Date to amend this Agreement so as to modify the Statement of Work or the Total Compensation or provide for an extension of time.

DELIVERABLES: All Work that is to be performed pursuant to the Statement of Work, in whole or in part, including, but not limited to, all equipment or materials that are incorporated within the Work.

DISTRICT'S PROJECT MANAGER: The District employee designated by the District to be responsible for overall coordination, oversight, and management of the Work for the District.

DISTRICT'S SUPPLEMENTAL INSTRUCTION: Instructions issued by the District's Project Manager to make minor adjustments in the Work not affecting the Total Compensation or the Completion Date, and consistent with the purpose of the Work.

FINAL RELEASE OF LIENS: The instrument that is to be signed by Surveyor and submitted to the District upon completion of the Work showing that all bills from subcontractors have been paid.

LETTER OF INTEREST: The written offer of Respondent (when submitted on the reproduced approved forms) to perform the Work and furnish the necessary materials in accordance with the provisions of this Agreement.

PERSON: Any individual, partnership, society, association, joint stock company, corporation, estate, receiver, trustee, assignee, referee, or capacity, whether appointed by a court or others, and any combination of individuals.

REQUEST FOR QUALIFICATIONS: An advertised solicitation for sealed letters of interest, with the title, date, and hour of the public opening designated. It includes a detailed description of the services sought, the date for submittal of the response, and all contractual terms and conditions.

RESPONDENT: Any person who submits a Letter of Interest in response to a Request for Qualifications.

STATEMENT OF WORK: The District's written directions, requirements and technical specifications for completing the Work. Standards for specifying materials or testing that are incorporated therein by reference shall have the same force and effect as if fully set forth therein.

SUBCONTRACTORS: Those persons having a direct contract with Surveyor relating to performance of the Work, including one who furnishes material worked into a special design in accordance with the plans or specifications of the Work, but not including one who merely furnishes material.

SURVEYOR: Surveyor, its officers, employees, agents, successors, and assigns.

SURVEYOR's PROJECT MANAGER: The individual designated by the Surveyor to be responsible for overall coordination, oversight, and management of the Work for Surveyor.

TOTAL COMPENSATION: The total funds to be expended pursuant to this Agreement upon satisfactory completion of the Work.

WORK: All labor, materials, equipment, transportation, supporting documentation, and other products, services, or facilities necessary for complete performance of the Agreement.

17. **ACCESS; WORK AREA; GATES**

(a) **Access.** The District will provide sufficient access to accomplish Work performed on District property. Surveyor shall maintain all on-site roadways and paved and unpaved access roadways

to and from the worksite in an acceptable and passable condition at no additional cost to the District, which shall, upon conclusion of the Work, be returned to their original condition. Land access to construction sites is restricted to the route designated by the District. Surveyor is responsible for improvements and repairs to access routes required during construction. All access routes shall be used for the purpose of construction only. Surveyor shall not disturb lands or waters outside the area of construction, except as may be found necessary and authorized by the District.

(b) **Work Area.** All Work shall be confined to the designated work area(s). Surveyor shall obtain written approval from the District before making any adjustments.

(c) **Gates.** Surveyor shall keep all gates to District lands or easements closed and locked in accordance with District specifications when not in use, and shall immediately notify the District when a gate has become impaired due to vandalism or other cause. Unless otherwise stated in the specifications, Surveyor shall be responsible for providing lock(s) to District properties.

18. **ASSIGNMENT AND SUBCONTRACTS.** Surveyor shall not sublet, assign, or transfer any Work involving more than ten percent of the total cost of the Work, or assign any monies due hereunder, without the District's prior written consent; provided, however, that in all cases, if the proposed subcontractor is different than the team specified by Surveyor in the contract award process, Surveyor shall notify the District's Project Manager in writing and obtain the District's prior approval. Neither District approval of a subcontractor nor any other provision of this Agreement creates a contractual relationship between any subcontractor and the District. Surveyor is responsible for fulfilling all work elements in any subcontracts and payment of all monies due. Surveyor is fully responsible to the District for the acts and omissions of its subcontractor and persons directly or indirectly employed by them, and shall hold the District harmless from any liability or damages resulting from any subcontract to the extent allowed by law.

19. **AUDIT; ACCESS TO RECORDS.** Surveyor must preserve its books and other records involving transactions related to this Agreement and provide the District, or its representatives, access and necessary facilities to inspect and audit those records for five years after the receipt of funds. If an examination or audit is performed, Surveyor must continue to maintain all required records until such audit has been completed and all questions arising from it are resolved. Surveyor shall refund any payment(s) that are not allowable costs based upon an audit examination.

20. **CIVIL RIGHTS.** Pursuant to chapter 760, Fla. Stat., Surveyor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, age, handicap, or marital status.

21. **CONFLICTING EMPLOYMENT.** Surveyor hereby represents that it has no undisclosed conflict of interest between the services to be provided under this Agreement and services provided by Surveyor to any other clients. Should either party become aware of any such conflict, that party will promptly notify the other thereof. The parties shall negotiate in good faith to resolve the conflict. If the conflict cannot be resolved, the District may terminate this Agreement upon 15 days prior written notice. In no case shall the Surveyor's Project Manager, or other key employees who have been so identified in the Statement of Work, be directly involved in providing services to other clients associated with the conflict. Notwithstanding the foregoing, Surveyor may accept retainers from or be employed by third parties whose interests appears conflicting or inconsistent with that of the District if, after full written disclosure of the facts to the District, the District determines that the apparent conflict shall not interfere with the performance of the Work.

22. **CONTINGENCY FEES.** Pursuant to §287.055(6)(a), Fla. Stat., Surveyor warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for Surveyor, to solicit or secure this Agreement, and that it has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for Surveyor, any fee, commission, percentage, or other consideration, contingent upon or resulting

from the award or making of this Agreement. For breach or violation of these provisions, the District may terminate this Agreement without liability and, at its discretion, deduct from the contract price or otherwise recover the full amount of any such fee, commission, percentage, gift, or other consideration.

23. **CORRELATION AND INTENT OF DOCUMENTS; QUESTIONS OR ISSUES REGARDING PERFORMANCE OF THE WORK**

(a) This Agreement and all attachments are complementary. What is called for by one is as binding as if called for by all. The intent is to include all labor and materials, equipment, transportation, and incidentals necessary for the proper and complete execution of the Work. Materials or work described in words, which so applied have a well-known technical or trade meaning, shall be held to refer to such recognized standards.

(b) It is the District's intention to fully assist Surveyor in the successful performance of the Work and to respond in a timely manner to questions or issues that arise. Surveyor should discuss any questions or issues with the District's Project Manager and communicate such questions or issues in writing when required by this Agreement. The District shall respond through its Project Manager.

24. **DISPUTE RESOLUTION**

(a) **During the course of work.** In the event any dispute arises during the course of the Work, Surveyor shall fully perform the Work in accordance with the District's written instructions and may claim additional compensation. Surveyor is under a duty to seek clarification and resolution of any issue, discrepancy, or dispute by submitting a formal request for additional compensation, schedule adjustment, or other dispute resolution to the District's Project Manager no later than 15 days after the precipitating event. If not resolved by the Project Manager within five business days, the Project Manager shall forward the request to the District's Office of General Counsel, which shall issue a written decision within 15 days of receipt. This determination shall constitute final action of the District and shall then be subject to judicial review upon completion of the Work. Surveyor shall proceed with the Work in accordance with said determination. This shall not waive Surveyor's position regarding the matter in dispute.

(b) **Invoices.** In the event the District rejects an invoice as improper, and the Surveyor declines to modify the invoice, the Surveyor must notify the District in writing within ten days of receipt of notice of rejection that the Surveyor will not modify the invoice and state the reason(s) therefore. Within five business days of receipt of such notice, if not informally resolved through discussion with the District Project Manager, the Project Manager shall forward the disputed invoice and the Surveyor's written response to the District's Office of General Counsel. The matter shall then proceed as described in subsection (a), above.

25. **DIVERSITY REPORTING.** The District is committed to the opportunity for diversity in its procurement activities, and encourages its prime vendors (Surveyors and suppliers) to make a good faith effort to ensure that women and minority-owned business enterprises (W/MBE) are given the opportunity for maximum participation as subcontractors. The District will assist Surveyor by sharing information on W/MBEs. Surveyor shall provide with each invoice a report describing the company names for all W/MBEs, the type of minority, and the amount spent with each at all levels. The report will also denote if there were no W/MBE expenditures.

26. **DUTY TO INSPECT AND REPORT DEFICIENCIES IN SPECIFICATIONS.** For any Work that is dependent upon conditions at the worksite, Surveyor's acceptance of contract award represents and warrants that Surveyor has inspected and satisfied itself concerning the nature and location of the Work and general and local conditions, including, without limitation: (1) conditions affecting transportation, disposal, handling, and storage of materials; (2) availability and quality of labor; (3) availability and condition of roads; (4) climatic conditions and seasons; (5) hydrology of the terrain; (6) topography and ground surface conditions; (7) nature and quantity of surface materials to be encountered; (8) equipment and facilities needed preliminary to and during the

Work; and (9) all other matters that can affect the Work and the cost thereof. Surveyor's failure to acquaint itself with such conditions will not relieve it from its responsibility for properly estimating the time required or cost of performing the Work. Where the District has investigated subsurface conditions, this data may be provided to Surveyor and is available upon request. Surveyor must either seek clarification concerning the data or assume responsibility for its interpretation.

27. **EMPLOYMENT ELIGIBILITY.** Surveyor must use the United States Department of Homeland Security's E-Verify system ("E-Verify") to verify the employment eligibility of all persons hired by Surveyor during the term of this Agreement to work in Florida. Additionally, if Surveyor uses subcontractors to perform any portion of the Work (under this Agreement) valued in excess of $3,000, Surveyor must include a requirement in the subcontractor's contract that the subcontractor use E-Verify to verify the employment eligibility of all persons hired by subcontractor to perform any such portion of the Work. Within 30 days of this Agreement's Effective Date, Surveyor must provide the District with evidence that Surveyor is enrolled in the E-Verify system. Answers to questions regarding E-Verify as well as instructions on enrollment may be found at the E-Verify website: www.uscis.gov/e-verify.

28. **GOVERNING LAW, VENUE, ATTORNEY'S FEES, WAIVER OF RIGHT TO JURY TRIAL.** This Agreement shall be construed according to the laws of Florida and shall not be construed more strictly against one party than against the other because it may have been drafted by one of the parties. As used herein, "shall" is always mandatory. In the event of any legal proceedings arising from or related to this Agreement: (1) venue for any state or federal legal proceedings shall be in Orange County; (2) each party shall bear its own attorney's fees, including appeals; (3) for civil proceedings, the parties hereby consent to trial by the court and waive the right to jury trial.

29. **INTEREST IN THE BUSINESS OF SURVEYOR; NON-LOBBYING.** Surveyor certifies that no officer, agent, or employee of the District has any material interest, as defined in chapter 112, Fla. Stat., either directly or indirectly, in the business of Surveyor to be conducted under this Agreement, and that no such person shall have any such interest at any time during the term of this Agreement. Pursuant to §216.347, Fla. Stat., monies received from the District pursuant to this Agreement shall not be used to lobby the Florida Legislature or any other state agency.

30. **INDEPENDENT CONTRACTOR.** Surveyor is an Independent Contractor. Neither Surveyor nor Surveyor's employees are employees or agents of the District. Surveyor controls and directs the means and methods by which the Work is accomplished. Surveyor is solely responsible for compliance with all labor and tax laws pertaining to it, its officers, agents, and employees, and shall indemnify and hold the District harmless from any failure to comply with such laws. Surveyor's duties include, but not be limited to: (1) providing Workers' Compensation coverage for employees as required by law; (2) hiring employees or subcontractors necessary to perform the Work; (3) providing any and all employment benefits, including, but not limited to, annual leave, sick leave, paid holidays, health insurance, retirement benefits, and disability insurance; (4) payment of all federal, state and local taxes, income or employment taxes, and, if Surveyor is not a corporation, self-employment (Social Security) taxes; (5) compliance with the Fair Labor Standards Act, 29 U.S.C. §§201, et seq., including payment of overtime as required by said Act; and (6) providing employee training, office or other facilities, equipment and materials for all functions necessary to perform the Work. In the event the District provides training, equipment, materials, or facilities to meet specific District needs or otherwise facilitate performance of the Work, this shall not affect Surveyor's duties hereunder or alter Surveyor's status as an Independent Contractor. This paragraph does not create an affirmative obligation to provide any employee benefits not required by law.

31. **LAND AND WATER RESOURCES.** Surveyor shall not discharge or permit the discharge, directly or indirectly, of any fuels, oils, calcium chloride, acids, insecticides, herbicides, wastes, toxic or hazardous substances, or other pollutants or harmful materials, onto any lands or into any surface or ground waters, including, but not limited to, streams, lakes, rivers, canals, ditches, or reservoirs. Surveyor shall investigate and comply with all applicable federal, state, county, and

municipal laws concerning toxic wastes, hazardous substances, and pollution of surface and ground waters. If any waste, toxic or hazardous substance, or other material that can cause pollution, as defined in §403.031, Fla. Stat., is dumped or spilled in unauthorized areas, Surveyor shall notify the District thereof within one business day and thereafter shall remove the material and restore the area to its original condition. If necessary, contaminated ground shall be excavated and disposed of as directed by the District and replaced with suitable fill material, compacted and finished with topsoil, and planted as required to re-establish vegetation. All cleanup and disposal costs shall be borne by Surveyor.

32. **PERMITS AND LICENSES; COMPLIANCE WITH LAW.** Surveyor shall comply with all applicable federal, state and local laws and regulations, including those pertaining to health and safety. All materials used and work performed must conform to the laws of the United States, the state of Florida and county and municipal ordinances. Surveyor represents and warrants that it is duly licensed to perform the Work in accordance with the laws of the state of Florida and the county or municipality in which the Work is to be performed. Unless otherwise specifically provided for herein, Surveyor shall give to the proper authorities all required notices relative to the Work in its charge; obtain and pay for all official permits or any other licenses, including any and all professional licenses required by the nature of the Work; and furnish any bonds, security, or deposits required to permit performance of the Work. Surveyor is responsible for the resolution of any issues resulting from a finding of noncompliance by any regulatory agencies, due to the Surveyor's failure to comply with applicable regulatory requirements, including all costs for delays, litigation, fines, or other costs.

33. **PUBLIC RECORDS.** Surveyor shall allow public access to all public records unless the documents are exempt under Florida law or are a confidential trade secret pursuant to §815.04(3)(a), Fla. Stat. If Surveyor is acting on behalf of the District by providing a governmental service to members of the public that would otherwise be provided by the District, Surveyor must retain its public records and make them available for public inspection and copying in accordance with §119.0701, Fla. Stat. If Surveyor a public records request, Surveyor shall promptly notify the District's Project Manager and follow the Project Manager's instructions regarding the release of those records.

34. **RELEASE OF INFORMATION.** Surveyor shall not publish or release any information related to performance of this Agreement, or prepare, publish, or release any news or press release in any way related to this Agreement, without prior District review and written consent.

35. **REMEDIES FOR NON-PERFORMANCE**

    (a) **District Remedies.** The remedies enumerated herein are non-exclusive. In addition to the remedies set forth below, the District may avail itself of any statutory and/or common law remedies not set forth herein. In the event of a breach, the District may terminate this Agreement for cause. Alternatively, the District may allow Surveyor to correct the deficiency, or may take such action as is necessary to correct such deficiency through District action or that of a third party. Delay or failure by the District to enforce any right or remedy hereunder shall not impair, or be deemed a waiver of, any such right or remedy, or impair the District's rights or remedies for any subsequent breach of this Agreement.

    (b) **Surveyor Correction of Deficiencies.** The District shall provide Surveyor with written notice of deficiency. At the District's sole judgment and discretion, the District may afford an opportunity to correct said deficiency, in which event the notice shall specify the time allowed to cure. If Surveyor disputes that a failure of performance has occurred, Surveyor shall, nevertheless, perform the corrective action and may submit a request for a Change Order subject to the dispute resolution procedure. Unless authorized through a Change Order, the Completion Date shall not be extended in order to correct deficiencies. Surveyor shall bear the cost of correcting all work of other Surveyors that is destroyed, damaged, or otherwise negatively impacted by its corrective action. Failure to take timely corrective action may result in termination for cause or the District pursuing alternative remedies, as provided herein.

(c) **Alternative Remedies to Correct Deficiency.** If the District determines that it is not in its best interest for Surveyor to correct incomplete or damaged Work caused by Surveyor's failure of performance, the District may pursue any or all of the following remedies, in whole or in part: (1) accept the Work as is and deduct the reasonable value of the deficient Work from the Total Compensation; (2) complete the Work through the utilization of District employees and deduct the cost thereof from the Total Compensation; (3) contract with a third party to complete the deficient Work and deduct the cost thereof from the Total Compensation.

(d) **District Technical Assistance.** The District may elect to provide technical assistance to Surveyor in order to complete satisfactory performance of the Work. If the District is performing a function that Surveyor is required to perform, the District may deduct the cost of providing such technical assistance from the Total Compensation. Prior to providing any such technical assistance, the District shall notify Surveyor that it considers such assistance to be above and beyond its duties under this Agreement and that it intends to deduct the cost of providing such assistance from the Total Compensation. Surveyor shall not be entitled to reject technical assistance when the District determines that such assistance is necessary to complete the Work.

36. **SAFETY.** For any Work that is to be performed on premises that are owned or controlled by the District (the Premises), Surveyor has the sole and exclusive duty for the safety of the premises. Surveyor shall provide and maintain sufficient protection for the safety of its employees and other persons who may utilize the Premises, and prevent damage to District property, materials, and equipment. Surveyor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the work assigned. Neither Surveyor nor its subcontractors shall allow or cause to be allowed any hunting or any weapons, animals, alcohol, or drugs, on or from the Premises or adjacent property. Surveyor employees shall not park their vehicles or store equipment or materials adjacent to roads where it may be a hazard to traffic. A clear distance of at least 30 feet from the edge of the pavement or right-of-way shall be kept free of any obstacles unless otherwise authorized by the District. Surveyor shall ensure that only authorized personnel are allowed on the worksite and shall post notices warning both employees and the public of all safety hazards created by Surveyor.

37. **SURVEYS; PRESERVATION OF MONUMENTS; POINTS AND INSTRUCTIONS**

(a) **Surveys.** When necessary to performance of the Work, unless otherwise provided in the Statement of Work, the District will furnish horizontal and vertical control necessary to lay out the Work, including horizontal reference point(s) and a vertical control benchmark within 200 feet of the site. The District will set the horizontal reference point(s) and vertical control only at the beginning of the job. Surveyor is responsible for interim staking during the job and all staking and layout work not otherwise furnished by the District. Surveyor shall furnish all construction layout of the Work, including layout, centerline, and grade stakes for access roadways. Surveyor shall furnish all personnel, equipment, and materials to make such surveys as are necessary to determine the quantity of Work performed. Field notes and computations for estimates shall be verified by the District's Project Manager as to the quantities estimated.

(b) **Preservation of Monuments.** Surveyor shall maintain and preserve all new and existing benchmarks, monuments, markers, reference points, and stakes established by others and/or the District. Should any of the aforesaid be destroyed or damaged by Surveyor, the same shall be replaced by Surveyor's licensed land surveyor at no cost to the District. Surveyor shall be responsible for the cost of any deficiencies in the Work caused by such loss or disturbance.

(c) **Points and Instructions.** Surveyor shall provide reasonable and necessary opportunities and facilities for setting points and making measurements. Surveyor shall not proceed until it has made a timely request to the District for, and has received, such points and instructions as may be necessary as the Work progresses. The Work shall be done in strict conformity with such points and instructions.

38. **TRUTH IN NEGOTIATIONS.** This provision applies only to lump sum or cost-plus-a-fixed-fee contracts entered into in excess of $150,000 (see §287.055(5)(a), Fla. Stat.). Consultant certifies that wage rates and other factual unit costs supporting the compensation are accurate, complete, and current at the time of contracting. The original contract price and any additions shall be adjusted to exclude any significant sums by which the District determines the contract price was increased due to inaccurate, incomplete, or noncurrent wage rates and other factual unit costs.

39. **USE OF COMPLETED PORTIONS OF THE WORK.** The District shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the fact that the time for completing the entire Work or such portions may not have expired. Such taking of possession and use will not be deemed an acceptance of any Work not completed. If such possession and use increases the cost of or delays the Work, Surveyor shall be entitled to a Change Order for extra compensation, or extension of time, as necessary, to offset the effect of such prior possession and use.

IN WITNESS WHEREOF, the St. Johns River Water Management District has caused this Agreement to be executed on the day and year written below in its name by its Executive Director, or duly authorized designee, and Surveyor has caused this Agreement to be executed on the day and year written below in its name by its duly authorized representatives, and, if appropriate, has caused the seal of the corporation to be attached. This Agreement may be executed in separate counterparts, which shall not affect its validity. Upon execution, this Agreement constitutes the entire agreement of the parties, notwithstanding any stipulations, representations, agreements, or promises, oral or otherwise, not printed or inserted herein. This Agreement cannot be changed by any means other than written amendments referencing this Agreement and signed by all parties.

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

By: _____
Hans G. Tanzler III, Executive Director (or designee)

Date: 02/17/15

Approved as to form and legality

_____
Assistant General Counsel
SJRWMD

THE SANBORN MAP COMPANY, INC.

By: _____
John R. Coppola
Typed Name and Title

Date: 02/12/15

Attest: _____
Amy E. Keppel, Corporate Secretary
Typed Name and Title

Attachment A — Statement of Work
Table 1 — USJRB Project Areas and Required Feature Datasets
Table 2 — List of Contract Deliverables and Time Frames
Attachment B — Insurance Requirements
Attachment C — District's Supplemental Instructions (sample)
Exhibit 1 — Plant Community Classification and Codes 2015-2017 USJRB Mapping Project
Exhibit 2 — Surveyor's Quality Control Plan
Exhibit 3 — Surveyor's Work Plan
Exhibit 4 — Surveyor's Billing Schedule
Figure 1 — Phased Imagery Capture Area for USJRB Plant Community Mapping Project
Figure 2 — USJRB Plant Community Mapping Area For 2015 – 2017

Surveying Services
Last modified: 01-26-15

ATTACHMENT A — STATEMENT OF WORK
AERIAL IMAGERY ACQUISITION AND PLANT COMMUNITY MAPPING
IN THE FLOODPLAIN OF THE UPPER ST. JOHNS RIVER

I. INTRODUCTION

Monitoring plant community changes in the Upper St. Johns River Basin (USJRB) is critical to maximizing environmental benefits through adaptive management. Plant communities in the upper St. Johns River floodplain were mapped in 2001 (baseline) and again in 2008 – 2010. These maps were created as part of a long-term plan to monitor changes in plant communities by creating detailed maps and spatial data for use in a Geographic Information System (GIS) analysis every six years. Since the last mapping event, there have been significant changes within the floodplain as a result of management/restoration activities, extreme weather events, and invasion of exotic and/or invasive species. Updated plant community maps will not only provide an indicator of ecological change due to these factors, but will also further our understanding of the relationships between plant community structure and hydrology, water quality, fire, and wildlife habitat.

II. OBJECTIVES

The purposes of this contract are to:

- Acquire aerial imagery in 2015 - 2017 and create detailed plant community spatial data and maps of the USJRB floodplain.
- Explore and utilize alternative image acquisition technologies and classification methodologies to provide more rapid, accurate, and cost-efficient maps.

III. SCOPE OF WORK

1. Target Area

The footprint for aerial imagery acquisition covers 471 square miles of the USJRB from the Florida Turnpike in Indian River County to just north of State Road 46 in Brevard County (Figure 1). The area to be mapped primarily includes floodplain wetlands and associated uplands and is equal in size at 471 sq mi (301,440 acres) (Figure 2). Imagery acquisition and mapping is partitioned into three phases to enable timely collection of signature key/training data and ground-truthing data for accuracy assessments.

2. Digital Image Data & Orthoimagery

The Surveyor shall obtain an estimated 471 square miles of digital imagery according to the phased approach depicted in Figure 1 and outlined in Table 1. To remain consistent with past mapping efforts, images shall be captured between February 15th and March 15th within a ten-day window for each year for the years 2015-2017. The imagery shall be of the highest quality, and shall conform to all standards and criteria set forth within this document and generally accepted as being appropriate for comparable professional-grade work, even if not specifically described or requested in this document. Digital orthophotos and digital mosaics shall be created from the raw digital image data and shall conform to the standards set forth in the Florida Baseline Specifications for Orthophotography and LiDAR (http://www.floridadisaster.org/gis/specifications/Documents/BaselineSpecifications_1.2.pdf). All work shall be performed under the direct supervision of a Florida Professional Surveyor and Mapper (PSM).

The specific objectives for the aerial imagery acquisition component of the project are to:

a) Acquire and produce digital aerial image data of the Target Area.

b) Provide airborne GPS (ABGPS) and inertial measurement unit (IMU) data, center-point data, a camera calibration report, a flight report, and flight line map for aerial photography or hyperspectral imagery.

c) Create digital orthophotos from the raw digital image data and create one, 4-band digital mosaic of the area. Provide a database of the checkpoint survey used to estimate the accuracy of the orthoimagery.

d) Post-process and aero-triangulate digital images to enable interpretation / classification of plant communities.

e) For each phase, provide a final report that describes the methodology used to create the raw imagery, digital orthophotography, and mosaics.

3. Plant Community Mapping

a) Classification Scheme

Exhibit 1 lists the thirty-three plant communities that are the traditional classification scheme for the USJRB plant community mapping project and is considered the minimum categorical resolution that is acceptable for this project. Additional classes or species categories would be valuable and desirable if accuracy standards can still be met. Plant Community Type is a higher level attribute in the classification hierarchy that will be assigned to each feature. The District would benefit from a more detailed classification system that can differentiate: 1) multiple levels of Carolina willow (*Salix caroliniana*) canopy cover, density, or stature; 2) invasive / exotic species such as West Indian Marsh Grass (*Hymenachne amplexicaulis*), Paragrass (*Urochloa mutica*), *Phragmites australis* and *Lygodium* spp.; and 3) between wet prairies that support native grasses / forbs and wet pastures that are dominated by exotic species. If additional plant/species categories are identified as part of this effort, a crosswalk to the original plant classification scheme must be included to allow for plant community change evaluation. In addition, the Surveyor shall consult with and get permission from the District's Project Manager (herein referred to as District's Project Manager) to change the classification scheme. The Surveyor shall meet with the District's Project Manager to discuss and clarify plant community classifications within three weeks after the start of the project.

b) Signature Key Development / Training Polygons

Procedures for signature key development shall be determined jointly by the District's Project Manager and the Surveyor. Upon receipt of new imagery each spring, signature key/training polygon development shall be performed in the field over the entire area of each phase before the start of the mapping process. The Surveyor shall examine the imagery and select areas to be visited in the field. During the process of signature development, the District's Project Manager may accompany the Surveyor to the field, with at least 48 hours notice to the Surveyor. All visits to the field by the Surveyor shall be recorded in a field notebook, which will include a brief description of the plant communities at each point visited. A differential GPS unit shall be used to record the exact location of visited points in Universal Transverse Mercator (UTM) to the nearest meter. Points shall be labeled with a unique identifier. Recorded points shall be converted into an Arc/Map shapefile. At least three photographs shall be taken at each point visited and a description of the species composition and abundance noted for each example. All photographs taken during this project shall be labeled with the date, the unique identifier assigned to the point, and the cardinal direction of the camera. The signature / training key development shall be complete 60 days following the acquisition of imagery.

The Surveyor shall coordinate with the District's Project Manager for all field trips requiring access to District property. For the most part, access to private property will not be feasible; since the vast majority of the area to be mapped is public land, the Surveyor should select points to visit that are located on public land. The District will provide a shapefile of District-owned land. The Surveyor shall provide for the use of airboats or other boats and vehicles required to access areas that need to be visited, and shall provide all field and safety equipment. The District's Project Manager will provide information on water levels, land ownership, and other conditions affecting access, provided that requests for information are made at least one week in advance of the time the information is needed. The Surveyor shall visit the areas to be mapped as needed during the entire mapping process, to increase their

familiarity with the plant communities present and to increase their ability to map these accurately.

c) Plant Community Delineation/Classification

Plant community maps shall be produced by individuals who are knowledgeable and experienced in delineating or discriminating Florida plant communities using remote sensing techniques (photointerpretation, computer classification, etc.) and in field identification of plant species typically occurring in those communities. All maps shall be created using Environmental Systems Research Institute's (ESRI) ArcMap software, V10.0 or V10.1 format. The aerial imagery acquired in 2008 – 2010 and the plant community spatial data will be available for use as a reference and as a starting point for the 2015 – 2017 mapping effort. Most of the required mapping can be accomplished by editing the linework from these shapefiles to reflect new plant community distributions. Minimal mapping units shall vary with the plant communities being delineated. Plant communities with high contrast boundaries shall have a minimal mapping unit of about 2000 m^2 (0.5 acres) or minimal width of 15 meters for elongated objects such as canals and levees. Communities with ill-defined boundaries (forming ecotones or interdigitating with other communities) shall have a minimal mapping unit of 12,000 m^2 (three acres). Positional accuracy of lines relative to the image shall be within five meters of the boundary. Edit environments in ArcGIS shall be set to yield the desired accuracy and precision described above. Proprietary classification or mapping methods are not acceptable. All techniques and methodologies shall be transparent and fully documented.

d) Geodatabases

In each phase, plant community maps shall be delivered as separate layers, one for each of the project areas designated in Table 1 and Figure 2, and as a combined phase layer. The format shall be feature classes within a single ArcGIS file geodatabase. The Surveyor shall produce all geodatabases using ESRI's ArcMap software, V10.0 or V10.1 format. The XY coordinate system of the geodatabase layers shall be NAD 1983 HARN UTM Zone 17N. The District will supply a shapefile or geodatabase with the boundary lines for the project areas.

Before data editing begins, the Surveyor shall provide an empty geodatabase, with feature classes and feature datasets defined, for approval by the District Project Manager. The geodatabase shall include draft domains for the non-numeric fields related to the plant communities, and any other geodatabase properties that the Surveyor determines to be useful during the data editing process. The District will also review and approve other geodatabase properties such as Domain, Resolution, and Tolerance for each feature class.

Project area feature classes:

The project area feature classes shall reside in a single feature dataset, named according to the delivery phase. Grouping of feature classes and naming convention is described in Table 1. All feature classes shall have the following fields:

Field Name	Field Type	Field Length	Notes
ProjArea	String	15	According to Table 1. (e.g., fdmca, bcmca, etc.)
Community	String	10	e.g., SG = Sawgrass
Type	String	5	Wetland type (e.g., HW = Herbaceous Wetland)
Acres	Numeric, Double	10	

Plant community features within each feature class shall have no gaps or overlaps. Project area boundaries between adjacent feature classes shall be coincident.

Combined phase feature class:

The combined phase feature class shall have the same structure as the project area feature classes, and reside as a stand-alone feature class within the geodatabase. Plant community

features shall have no gaps or overlaps. All project area boundaries shall be dissolved. A QC checklist shall be used to evaluate each project geodatabase. A frequency distribution shall be used on the attribute table to evaluate community codes.

The combined phase feature class shall have metadata that at a minimum includes:

- Definitions of attribute values for each field
- Lineage and source information, including data creation dates and dates of imagery used for mapping
- A general abstract / layer description
- Information in the ESRI Item Description fields

The metadata shall be readable to users who wish to view either ESRI Item Description fields or the full ArcGIS Metadata record. Clarification can be provided by the District's Project Manager when the metadata is being populated.

e) Ground-truthing

Random data points shall be generated to conduct an accuracy assessment of the plant community mapping in each project area within each phase. The National Oceanographic and Atmospheric Administration's (NOAA's) Sampling Design Tool for ArcGIS can be used to follow a random sampling scheme stratified by map category. The "community" attribute shall be used as the map category for stratification. Using the draft plant community map, points shall be located within community types (i.e., polygons) with a total cumulative acreage of more than 50 acres. A minimum of ten points from each plant community category shall be sampled following Card (1982) and shall be located within at least 30 meters from the polygon boundary except for cases in which polygons are narrower than 30 meters (e.g., canals, levees). If points are determined to be too close to the polygon boundary, the point shall be relocated closer to the center of the polygon if possible. Alternatively, another random point may be selected. Points that are selected should not occur in the same polygon. In the event that this does occur in a large polygon, the points should be at least (>30 meters) apart from one another. Ground-truthing should be completed within six and one-half months following aerial imagery acquisition to ensure that vegetation communities (especially annual species) are representative of those that were photographed.

f) Thematic Accuracy Assessment

An accuracy assessment analysis and report shall be provided for each of the three phases in each year. Each accuracy assessment report shall contain an error matrix and associated statistics, and a list of the ground-truth points with their precise locations. Each matrix shall consist of at least ten points for each community type as required in the ground-truthing effort. In consultation with the District Project Manager, the accuracy assessment analysis may follow the approach presented in Card (1982) or any other vetted approach that can be justified as appropriate for this type of analysis. The goal is to achieve an overall thematic accuracy of 90% for all plant communities within each phase. An accuracy of less than 85% is not acceptable. No individual plant community shall have a user's accuracy of less than 75% except as specified below. If ground-truth points have an overall accuracy of less than 85%, the Surveyor shall investigate the source of error and, after consulting with the District Project Manager, determine if: 1) some areas need to be re-interpreted or re-classified; 2) lower user accuracy may be acceptable for some uncommon community types; or 3) some community types need to be combined. These decisions shall be made independently for each phase.

g) Test Plot

The Surveyor shall supply one completed test plot (approximately 1,000 acres in size), along with an associated accuracy assessment, within 30 days from the date of delivery of the signature / training key. The test plot location and boundary will be identified by the District's Project Manager and will encompass a variety of plant community types. The completed test plot will be examined by the District for positional and thematic accuracy and accepted or rejected within two weeks. Thematic accuracy of the test plot will be assessed by field

checking of at least 20 randomly selected points. The District Project Manager will select the point and the sites will be visited jointly by the District's Project Manager and the Surveyor. If the test plot does not meet the accuracy standards, the Surveyor shall, in consultation with the District's Project Manager, institute additional quality control measures to insure that all final products will meet those standards. The Surveyor shall then revise the test plot based on additional quality control measures and resubmit this material within two weeks. *Classification of plant communities in the test plot must comply with thematic accuracy standards for work to proceed.*

4. Scope of Work and Quality Control Plan

The final Statement of Work and Quality Control Plan shall include, but not be limited to:

a) A review of available image data acquisition techniques and mapping methodologies; and the justification of the selected technique/methodology.

b) A description of the quality control measures to be employed in the project.

c) An inspection protocol for each shapefile, which shall include assessments of compliance with positional and thematic accuracy.

d) A method for accuracy assessment, including the type of error matrix and statistics to be used, which will employ data gathered in the field at stratified, random points during the ground-truthing phase of the project.

The specific objectives for the mapping component of the project are to:

a) Create ArcGIS maps showing the distribution of the 33 plant communities found in the USJRB. Provide the ArcGIS files necessary to create these maps and for use in spatial analyses of change in plant community distribution (complete with metadata).

b) For each phase, provide a final report that describes the methodology used to assess the accuracy of the mapping effort. Provide an analysis of the distribution of plant communities.

IV. TASKS

This contract is divided into three distinct work phases (see Figure 1). Each phase is further divided into USJRB Project Areas (18 total) which shall be mapped as separate feature datasets in the file geodatabase (Table 1 and Figure 2). The final product for each phase shall be completed and accepted by the District before the next is initiated.

1. Digital Aerial Imagery

Create or acquire raw digital image data that meets the following specifications:

a) Imagery Area

The target area for image data capture encompasses approximately nine-hundred (900) square miles of the USJRB from the Florida Turnpike in Indian River County to just north of State Road 46 in Brevard County (Figure 1).

b) Mission Constraints

Weather conditions: Imagery capture will only be acceptable during the following conditions: calm, clear, cloud-free, and visibility of at least seven miles. Wind speed should be sufficiently low so that a straight flight line can be maintained if aerial photography or hyperspectral imagery is being acquired.

Flight season: All imagery shall be obtained between February 15th and March 15th within a ten-day window for each year. Email notification of the Mission Plan shall be provided to the District's Project Manager 24 hours prior to the flight and a detailed flight report shall be submitted within 24 hours of the completed mission.

Time of day: If using traditional true color / color infrared (CIR) imagery, images shall be taken when the sun angle is between 30° and 65° above the horizon (approximately 9:30 – 11:30 a.m. and 2:30 – 4:30 p.m.) because shadows from trees are important diagnostic characteristics. Imagery obtained outside of this time-frame will have limited usefulness. If using alternative image acquisition, images should be taken at the time of day that maximizes differences in signatures between plant communities.

Flight line orientation: The flight lines shall be oriented in a direction for efficiency of coverage and to minimize bi-directional illumination. Flight lines shall cover the target areas with spacing such that the appropriate overlap is obtained to allow viewing and mapping within required tolerances. Flight lines shall be provided to the District Project Manager at least five business days prior to commencement of flights for review and approval. Final mission details shall be submitted to District staff prior to flying.

Airborne Global Positioning System (ABGPS) and Inertial Measurement Unit (IMU) Data (for aerial photography): ABGPS and IMU Data: Data collection will require the use of an Airborne Global Positioning System and an Inertial Measurement Unit. The ABGPS/IMU data shall include ID, x, y, z, phi, kappa, and omega. The x and y coordinates shall be submitted in UTMs (Zone 17N) and the z coordinates shall be submitted in NAVD88. The ABGPS/IMU processing report showing a graphical comparison of forward versus reverse processing shall also be provided with the ABGPS/IMU data. Prior to demobilizing, the Surveyor shall check to ensure that there are no gaps or missing values in the ABGPS/IMU data. The Surveyor shall be responsible for planning the number and location of GPS base stations that conform to the industry standard for ground-located verification points. Ground control data shall be submitted to the District Project Manager in the Mission Plan prior to the flight. All ABGPS and IMU data are deliverables.

c) Specifications for Traditional CIR/True-color Imagery

Sensor: Imagery shall be acquired using a frame-based digital sensor (UltraCamX, UltraCam Eagle, or similar) for CIR or true-color images.

Bands and radiometry: All imagery shall be acquired in a four-band digital format. A four-band stack including blue, green, red, and near-infrared bands shall be delivered. Geometric misalignment between any of the bands shall not be accepted. Raw imagery shall be processed so the images consist of a color- and tone-balanced radiometry.

Ground Sample Distance (GSD): All raw imagery shall have a nominal ground sample distance not to exceed 0.9 feet.

Image resolution: All imagery shall be delivered at a resolution of no less than one pixel per foot.

Coverage: Stereo imagery (or oriented images) shall be suitable for stereo viewing with a photogrammetric workstation and Earth Resources Data Analysis System (ERDAS) Stereo Analyst for ArcGIS. Complete stereoscopic coverage must be available for the entire target area including all the adjoining levees, canals, and roads. Stereo imagery shall be acquired utilizing a 60% forward overlap and a 30% side overlap. Overlap in the direction of the flight shall average 60%, within five percent. Sidelap between overlapping parallel flight lines of imagery shall average 30%, within ten percent.

Exposure: Exposure shall be calibrated to tree canopy or other vegetation features. Particular care shall be taken to avoid overexposure of areas dominated by open water – these areas must be exposed for vegetation.

Image quality: The final imagery shall be free of noticeable vignetting and shall have minimal sun spot and washout. Ground features shall not be obscured by clouds, dense cloud shadows, haze, or smoke.

d) Imagery Review

Within seven days of the flight, raw aerial imagery shall be delivered to the District's Project Manager for review. The District's Project Manager will have seven days to determine if the frames or swaths are of sufficient quality for processing, ortho-rectification, mosaicing, classification, and identification of plant communities. If they are deemed acceptable, the raw imagery shall be approved by the District's Project Manager and the Surveyor can begin Task 2. If the raw imagery is not approved by the District's Project Manager, the affected gaps in coverage shall be re-flown as soon as possible to capture imagery within the time-frame identified as optimal (Feb 15th – Mar 15th) at no additional cost to the District. However, in the event that imagery is acquired as late as March 15th, accommodations to the schedule will be made in order to obtain replacement imagery.

2. Orthorectification and Mosaic Compilation

The Surveyor shall provide the equipment and personnel necessary to orthorectify, mosaic, aero-triangulate, and post process the aerial imagery necessary to create mosaics for the area of interest. Surveyor shall create individual orthophotos and one, 4-band mosaic, of the project areas from the raw digital image data. Existing digital terrain models (DTM) available from USGS shall be used for the orthorectification and should be used to supplement ground control points indentified in the mission plan. The ground control used for aerotriangulation shall be obtained by the Surveyor and should include the number of ground control points with x, y, and z coordinates that are considered the industry standard. The Florida Baseline specifications indicate that a minimum of 20 independently surveyed image checkpoints will be used for accuracy testing and control acceptance for every 500-square-mile subset of the project area. Orthoimagery check points shall be distributed so that points are spaced at intervals of at least ten percent of the diagonal distance across the dataset and at least 20% of the points are located in each quadrant of the dataset. Aerotriangulation shall be completed so that all resultant imagery and map products result in a horizontal accuracy as defined by USGS National Map Accuracy Standards (NMAS) for 1:24,000 scale maps. A metadata file shall be prepared that describes the processes used to orthorectify the imagery and to create the digital mosaics. The projection for these files shall be in UTMs for UTM Zone 17 North with a datum of NAD1983HARN (HPGN) and the units shall be in meters.

3. ArcGIS Plant Community Maps

Create an ArcGIS file geodatabase in ESRI's 10.0 or 10.1 format and an ArcMAP project of the vegetation communities within the project area boundaries (Figure 1). The Surveyor shall provide a final map of plant communities (hard copies, ArcGIS shapefiles, and ArcMAP map package .mpk), a signature/training key, a test plot, an accuracy assessment report that contains an error matrix and associated statistics, and an overall report that shows a high-level analysis of the plant communities, and any changes relative to the previous plant community map.

4. Final Report

A draft Final Contract Report shall be submitted no later than 30 days prior to contract termination. It shall include collated information from all three Phases and shall be presented with an Executive Summary. It should be comprehensive and include the background of the project, the methodology utilized for all components of the project, and the summarization of changes in plant community distribution between the 2008 – 2010 and 2015 – 2017 maps. The District Project Manager will return comments within two weeks and the final version will be due upon contract termination.

V. TIMEFRAMES AND DELIVERABLES

Specific due dates are provided in the list of deliverables and time-frames in Table 2.

1. Digital Imagery Data

a. Surveyor shall provide a Mission Plan for the flight, that includes specifications on flight lines and ground control points, 24 hours prior to the planned mission.

b. Surveyor shall provide a flight report within 24 hours of imagery acquisition that includes, but is not limited to, the following information: Mission, Job #, Date, Job Name, Job Location, Aircraft, Exposure/filter, Line #'s, Direction, Start and End frame or exposure #, UTC time, EST time, altitude, and remarks.

c. Surveyor shall deliver all airborne GPS and IMU (inertial measurement unit) data collected during imagery acquisition. Data shall be formatted in UTMs (m) with a NAD83 datum for the GPS/POS file and time of acquisition shall be formatted in Eastern Standard Time (EST).

d. Surveyor shall deliver the manufacturer's camera calibration report for the sensor utilized for acquisition.

e. Surveyor shall deliver an ESRI file geodatabase (V.10.0 or V.10.1) containing the following layers:
   1) Flight lines (line layer).
   2) An image depicting the footprint of each image (polygon layer) with a field containing the image file name.
   3) Ground control points (with horizontal and vertical measurements).

f. Surveyor shall deliver raw, digital image data of the target area in uncompressed TIFF file format and compressed ECW (Enhanced Compressed Wavelet) format with valid projection header information. Frames that are considered "leader or starter" images and are outside of the target area shall be designated as such.

2. Orthorphotos and Mosaics

Individual digital orthophotos and orthophotography mosaics shall include all of the imagery from the target area for each Phase in one, 4-band mosaic. A metadata file that includes information on the processes used to create the orthophotos and the digital mosaics shall be included.

Surveyor shall deliver:

a. Individual georectified, orthoimagery as GeoTiff files (.tiff and .tfw) and compressed files in SIDs or JP2 format

b. Orthoimagery as GeoTiff files (.tiff and .tfw) and compressed files in SIDs or JP2 format, including one, 4-band project-wide mosaic

Orthoimagery checkpoint data as an ArcGIS File Geodatabase (.gdb) and coordinating survey and accuracy report on checkpoints (.pdf).

c. Surveyor shall deliver a single metadata file (.xml format) for each phase that is compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata in an ArcCatalog compatible XML format. At a minimum, the metadata shall include the following information:
   1) Image collection date and time (ET)
   2) Sensor description
   3) Processing software and methodology for imagery acquisition
   4) Positional accuracy and procedures used to determine accuracy
   5) Processing methodology for rectification of imagery used to create the digital mosaics

3. Plant Community Maps

The Surveyor shall deliver the completed shapefiles and accuracy assessment for each phase and project area according to Table 1. The District's Project Manager shall examine the shapefiles for positional and thematic accuracy and accept or reject the shapefiles within two weeks of receipt. If the shapefiles do not meet positional and thematic accuracy standards, the District shall return them to the Surveyor with comments. The Surveyor shall incorporate corrections into the final ArcGIS file geodatabase and the final report within two weeks of receipt.

The Surveyor shall deliver:

a. Signature/Training Key — ArcGIS files, Excel spreadsheet with GPS location and plant community notes, and ground photographs.

b. Test plot data including ArcGIS files, ground-truthing data, accuracy assessment, and ground photographs.

c. Ground-truthing ArcGIS files, Excel database and support materials (ground photographs, copies of the field notebooks).

d. Plant community ArcGIS file geodatabase (.gdb) with complete metadata in ESRI's 10.0 or 10.1 format and map package (.mpk) for the plant community map.

e. Hard copy maps (in a format agreeable to the District's Project Manager) of each project area and phase.

f. A final annual report of the high-level vegetation analysis and accuracy assessment.

4. Final Contract Report

A draft Final Contract Report shall be submitted no later than 30 days prior to contract termination. It shall include collated information from all three Phases and shall be presented with an Executive Summary. It should be comprehensive and include the background of the project, the methodology utilized for all components of the project, and the summarization of changes in plant community distribution between the 2008 – 2010 and 2015 – 2017 maps. The District Project Manager will return comments within two weeks and the final version will be due upon contract termination.

VI. BUDGET

The anticipated overall budget for the entire project is $425,000. The budgeted amount for Deliverables 1– 4.d. (for the first mapping effort) is $125,000. Subsequent years will have a similar level of funding that is commensurate with the amount of area being photographed, the complexity of the plant communities being mapped, and the deliverables expected for that year. The Surveyor shall invoice on a deliverable-completed basis according to Table 2 and in accordance with Exhibit 4 — Surveyor's Billing Schedule.

Remainder of page left blank intentionally.

Table 1 — USJRB Project Areas and Required Feature Datasets (refer to Figures 1 & 2)

Map No.	Name of Project Area	File Geodatabase Name	Area (ac)
PHASE 1 (2015)			
1	Ft. Drum Marsh Conservation Area	fdmca	20,656
2	Blue Cypress Marsh Conservation Area (including Kenansville Lake)	bcmca	48,882
3	Fellsmere Water Management Area	fwma	11,179
4	Blue Cypress Water Management Area (including Banjo Groves, Corrigan, & Kromhout)	bcwma	11,776
PHASE 2 (2016)			
5	Three Forks Marsh Conservation Area	tfmca	13,716
6	Sixmile Restoration Area	sixmile	2,727
7	Sartori West	sartori	1,928
8	Broadmoor Marsh Restoration Area C-54 Retention Area (Goodwin Waterfowl Mgmt Area)	broadgood	6,788
9	Deseret Ranch	deseret	6,039
10	Sawgrass Lake Water Management Area C1 Retention Area	sawgrass	3,336
11	C1 Detention Area	c1deten	2,346
12	St. Johns Marsh Conservation Area	sjmca	23,247
13	Bull Creek Wildlife Management Area Jane Green Detention Area	bullcreek	27,887
PHASE 3 (2017)			
14	River Lakes Conservation Area	riverlakes	28,917
15	Moccasin Island Marsh Restoration Area	moccasin	14,023
16	Lake Poinsett / Canaveral Marshes Conservation Area	canaveral	39,543
17	Seminole Ranch Conservation Area	seminole	37,832
18	Buck Lake Conservation Area	bucklake	10,651

Table 2 — List of Contract Deliverables and Time Frames

Deliver-able #	Item	Delivery Method	Format	Due Date	Year(s)
Aerial Imagery					
1.a.	Mission Plan	Emailed and archived on hard drive	.doc	24 hours before flight	2015 2016 2017
1.b.	Mission Log	Emailed and archived on hard drive	.doc	24 hours after flight	2015 2016 2017
1.c.	ABGPS/IMU Data & Processing Report	Emailed and archived on hard drive	.xlsx .pdf or .doc	Seven days after flight	2015 2016 2017
1.d.	Camera Calibration Report	Emailed and archived on hard drive	.pdf or .doc	Two weeks after flight; no later than March 31st	2015 2016 2017
1.e.1.	Center Coordinates of Frames	Emailed and archived on hard drive	.txt, .xls, or .xlsx	Two weeks after flight; no later than March 31st	2015 2016 2017
1.e.2.	Flightline Map with Center Coordinates, Frame Polygons, and Ground Ctrl Pts	Duplicate hard copies and archived on hard drive	.shp	Two weeks after flight; no later than March 31st	2015 2016 2017
1.f.	Raw Digital Image Data	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	Uncompressed .tiff	Seven days after flight	2015 2016 2017
Orthophotos and Mosaics					
2.a.	Individual Digital Orthophotos	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.tif, .tfw, SIDs or JP2	May 1st	2015 2016 2017
2.b.	Mosaic	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.tif, .tfw, SIDs or JP2	May 1st	2015 2016 2017
2.c.	Checkpoint Survey & Report	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	ArcGIS File Geodatabase (.gdb) & .pdf	May 1st	2015 2016 2017
2.d.	Orthophoto Mosaic Metadata	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.xml	May 1st	2015 2016 2017
Plant Community Maps					
3.a.	Signature/Training Key Photos and Database	Emailed and external hard drive	.xlsx and .jpg	Two months after flight; no later than May 15th	2015 2016 2017
3.b.	Test Plot with associated ground-truthing and Accuracy Assessment	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	ArcGIS shapefile (.shp) .xlsx .doc .jpg	June 15th	2015 2016 2017

Deliver-able #	Item	Delivery Method	Format	Due Date	Year(s)
3.c.	Ground-truthing ArcGIS Data and Support Materials	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	. ArcGIS shapefile (.shp) .xlsx .doc .jpg	September 30th	2015 2016 2017
3.d.1.	Draft ArcGIS Data	External hard drive	ArcGIS File Geodatabase (.gdb)	September 30th	2015 2016 2017
3.d.2.	Final ArcGIS Data	External hard drive	ArcGIS File Geodatabase (.gdb)	November 1st	2015 2016 2017
3.d.3.	Metadata	External hard drive	.xml populated in the .gdb file	November 1st	2015 2016 2017
3.d.4.	Map Package(s)	External hard drive	.mpk	November 1st	2015 2016 2017
3.e.	Map Plots	Duplicate hard copy plots and external hard drive	Custom size based on project area geography (1 each sub-project area; 1 entire project area)	November 1st	2015 2016 2017
3.f.1.	Draft Annual Report on Plant Community Analysis and Accuracy Assessment	Duplicate hard copies and external hard drive	.doc	December 1st	2015 2016 2017
3.f.2.	Final Annual Report on Plant Community Analysis and Accuracy Assessment	Duplicate hard copies and external hard drive	.doc	January 15th	2016 2017 2018
Final Documents					
4.a.	Draft Final Contract Report with Executive Summary	Duplicate hard copies and external hard drive	.doc	Mar 1st	2018
4.b.	Final Contract Report with Executive Summary	Duplicate hard copies and external hard drive	.doc	April 1st	2018

ATTACHMENT B — INSURANCE REQUIREMENTS

Surveyor shall acquire and maintain until completion of the Work the insurance coverage listed below, which constitutes primary coverage. Surveyor shall not commence the Work until the District receives and approves Certificates of Insurance documenting required coverage. Surveyor's General Liability policy shall include Endorsement CG 20101185, or equivalent, naming the St. Johns River Water Management District (the "District") as Additional Insured. All required policies shall include: (1) endorsement that waives any right of subrogation against the District for any policy of insurance provided under this requirement or under any state or federal worker's compensation or employer's liability act; (2) endorsement to give the District no less than 30 days notice in the event of cancellation or material change. Certificates of Insurance must be accompanied by copies of the requested endorsements.

Any deductibles or self-insured retentions above $100,000 must be declared to and approved by the District. Approval will not be unreasonably withheld. Surveyor is responsible for any deductible or self-insured retention. Insurance must be placed with insurers having an A.M. Best rating of A-V or greater. District receipt of insurance certificates providing less than the required coverage does not waive these insurance requirements.

(a) **Workers' Compensation Insurance.** Workers' compensation and employer's liability coverage, including maritime workers compensation, if applicable, in not less than the minimum limits required by Florida law. If Surveyor claims an exemption from workers' compensation coverage, Surveyor must provide a copy of the Certificate of Exemption from the Florida Division of Workers' Compensation for all officers or members of an LLC claiming exemption who will be participating in the Work. In addition, Surveyor must provide a completed District "Affidavit (Non-Construction)" for non-construction contracts. Surveyor is solely responsible for compliance with any Federal workers' compensation laws such as Jones Act and USL&H Act, including any benefits available to any workers performing work on this project.

(b) **General Liability.** Commercial General Liability Insurance on an "Occurrence Basis," with limits of liability not less than $1,000,000/$2,000,000, for personal injury, bodily injury, and property damage. Coverage shall include: (1) contractual liability, (2) products and completed operations, (3) independent contractors, and (4) property in the care, control, or custody of the Surveyor. Extensions shall be added or exclusions deleted to provide the necessary coverage.

(c) **Automobile Liability.** Minimum limits of $100,000/$300,000/$50,000

(d) **Professional Liability.** (per claim) $1,000,000 single limits.

(e) **Aircraft Liability.** Minimum coverage of $1,000,000 per occurrence, Combined Single Limit, for bodily injury (including passenger liability) and property damage.

(f) **Pollution/Environmental Impairment Liability Coverage.**

1. Surveyor is responsible to provide this coverage through its automobile liability, general liability or a separate policy if it stores or transports fuel on a vehicle, trailer or piece of equipment.

2. Surveyor is responsible to provide this coverage through its general liability or a separate policy if it has a fuel storage tank stationed on the work site.

Policy Limits. Not less than $500,000 per occurrence and/or aggregate combined single limit, personal injury, bodily injury, and property damage and remediation costs.

ATTACHMENT C — DISTRICT'S SUPPLEMENTAL INSTRUCTIONS (sample)

DISTRICT SUPPLEMENTAL INSTRUCTIONS #

DATE:

TO: Krysia Sapeta, Project Manager
The Sanborn Map Company, Inc.
1935 Jamboree Drive, Suite 100
Colorado Springs, Colorado 80920-5358

FROM: Kimberli Ponzio, Project Manager

CONTRACT NUMBER: 28099

CONTRACT TITLE: Aerial Imagery Acquisition and Plant Community Mapping in the Floodplain of the Upper St. Johns River

The Work shall be carried out in accordance with the following supplemental instruction issued in accordance with the Contract Documents without change in the Contract Sum or Contract Time. Prior to proceeding in accordance with these instructions, indicate your acceptance of these instructions for minor adjustments to the work as consistent with the Contract Documents and return to the District's Project Manager.

1. SURVEYOR'S SUPPLEMENTAL INSTRUCTIONS:

2. DESCRIPTION OF WORK TO BE CHANGED:

3. DESCRIPTION OF SUPPLEMENTAL INSTRUCTION REQUIREMENTS:

Surveyor's approval: (choose one of the items below):

Approved: _____ Date: _____

(It is agreed that these instructions shall not result in a change in the Total Compensation or the Completion Date.)

Approved: _____ Date: _____

(Surveyor agrees to implement the Supplemental Instructions as requested, but reserves the right to seek a Change Order in accordance with the requirements of the Agreement.)

Approved: _____ Date: _____
Kim Ponzio, District Project Manager

Acknowledged: _____ Date: _____
Madeline Northcutt, District Procurement Specialist

c: Contract file
Financial Services

EXHIBIT 1 — PLANT COMMUNITY CLASSIFICATION AND
CODES 2015-2017 USJRB MAPPING PROJECT

Type	Community		Description
OW	Open Water		
	OW	Open Water	Natural or large impounded water bodies with no floating or emergent vegetation, however, submersed vegetation may be pre-
	CA	Canals, ditches and borrow pits	Small man-made water bodies.
	FF	Free-floating plants	Water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), *Salvinia* spp., and other species that are not connected to the substrate of the water body.
	HY	Hydrilla	Areas with hydrilla (*Hydrilla verticillata*) covering more than 70% of the water surface.
HW	Herbaceous Wetland		
	CT	Cattail	Contains 70% or greater coverage of cattail (*Typha* spp.). sawgrass, ferns, other herbaceous species, and small shrubs may also be promi-
	CTSG	Cattail/sawgrass	Contains cattail and sawgrass mixes that contain less than ten percent of other species and contain 30-60% cattail with the remainder saw-
	GS	Grass/sedge Marsh	Contains 70% or greater coverage of obligate (OB) or facultative wet (FACW) grass or sedge species such as maidencane (*Panicum hemitomon*), cupscale (*Sacciolepis striata*), spikerush (*Eleocharis* spp., *Rhynchospora* spp.). Other herbaceous species including saw-grass, cattail, and shrubs may be present.
	HM	Mixed Herbaceous Marsh	Consists of a combination of broadleaf emergents (e.g. *Sagittaria* spp., *Pontedaria* spp., *Petlandra* sp.) with grasses, sedges, and other herba-ceous species such as *Hydrocotyle* sp., *Polygonum* spp., sawgrass, cat-tail, where no one species accounts for 70% or greater. Small shrubby plants (*Cephalanthus occidentalis*, *Kostelezkya pentacarpus*, and *Hibis-*
	SG	Sawgrass	Contains 70% or greater coverage of sawgrass (*Cladium jamaicense*). Cattail, ferns, other herbaceous species and small shrubs may also be prominent.
	SM	Salt marsh/salt flat	An area where salty groundwater seeps to the surface and is character-ized by the presence of one or more of the following species: sand cordgrass (*Spartina bakeri*), sea-purslane (*Sesuvium* sp.), glasswort (*Salicornia* or *Sarcocornia* sp.), marshelder (*Iva* sp.), saltbush (*Baccharis* spp.), and black needlerush (*Juncus roemerianus*). Bare soil is often a significant part of this community.
	SP	*Spartina* Marsh	Contains 70% or greater coverage of sand cordgrass (*Spartina bakerii*), with soft rush (*Juncus effuses)* and other shallow water, short hydroperiod plants as minor components.
	WL	Water Lilies	Contains 70% or greater coverage of bottom-rooted species with floating leaves including water lily (*Nymphaea* spp.), spatterdock (*Nuphar luteum*), and lotus (*Nelumbo* spp.). Also may contain bladderworts (*Utricularia* spp.)
	WP	Wet prairie/wet pas-ture	A mix of herbaceous species that are typical of short hydroperiod wet-lands with most plants classified as facultative wet (FACW) or facul-tative (FAC). Similar to mixed herbaceous marsh except that long hydroperiod species should not be present, while *Spartina bakeri* and *Juncus effusus* may be present as minor components (less than 30%). This category should also be used for former pastures that have been reflooded and for wet, unimproved pastures.

Type	Community		Description
SW	Shrub Wetland		In general, the shrub layer must be twice as tall as the herbaceous layer but less than half the height of the tree layer in order to be readily detectable using a stereoscope without resorting to stereoscopic height
	WS	Willow Swamp	Contains 70% or greater canopy coverage of willow (*Salix caroliniana*), that is at least twice as tall as the herbaceous layer.
	LU	Ludwigia	Contains 70% or greater canopy coverage by *Ludwigia peruviana* that is at least twice as tall as the herbaceous layer.
	MS	Mixed Shrub Swamp	Contains a mixture of shrub species (e.g. *Myrica cerifera*, *Salix caroliniana*, etc.) and/or trees that are at least twice as tall as the herbaceous layer. Tree species such as red maple (*Acer rubrm*) should be either less than twice as tall as the shrubs, or be less than 30%.
	TS	Transitional Shrub	Contains 70% or greater cover of species found in areas with shorter hydroperiods than in Mixed Shrub or Willow Swamps and is characterized by the presence of wax myrtle (*Myrica cerifera*), saltbush (*Baccharis* spp.), Brazilian pepper (*Schinus terebinthifolius*) or other FAC shrub species.
FW	Forested Wetland		
	CY	Cypress Swamp	Contains 70% or greater cover by *Taxodium* spp
	HS	Hardwood Swamp	Contains 70% or greater coverage of mixed wetland tree species such as red maple (*Acer rubrum*), black gum (*Nyssa* spp.), and ash (*Fraxinus* sp.), which are tolerant of fairly long hydroperiods and water depths.
	HH	Hydric Hammock	Contains 70% or greater coverage of mixed wetland tree species associated with depressions having moderately long hydroperiods, such as *Nyssa* spp., *Ulmus americana*, and wetland *Quercus* spp.
	CP	Cabbage Palm Hammock	Hammocks consisting of more than 70% Sabal palmetto, which may occur in hydric to mesic conditions.
	TI	Tree Island	Relatively small patches of trees within the marsh (tree islands), consisting of mixed wetland tree species which may include red maple (*Acer rubrum*), cabbage palm (*Sabal palmetto*), dahoon (*Ilex cassine*), and pond apple (*Annona glabra*). Islands may be surrounded by a narrow border of shrubs.
HU	Herbaceous Upland		
	DP	Dry Prairie	Contains greater than 70% coverage of mixed upland grasses, herbs, etc. with few to no trees.
	PA	Pasture	Similar to dry prairie but with evidence of maintenance by humans (fence lines, structures, water troughs, etc); on the ground diagnosed by the presence of introduced and cultivated grass species.
	RC	Row Crop / Orchard	Contains 70% or greater coverage by cultivated species with evidence of arrangement in rows, with or without drainage ditches. Includes orchards or groves and fallow fields.
	LR	Levees with roads	Levees with surface maintained for vehicles, either mowed, gravel or paved.
SU	Shrub Upland		An area with greater than 70% coverage of woody species that are at least twice the height of the herbaceous layer, but less than half the height of the tree layer and that is saturated or inundated for less than ten percent of the growing season.
	PP	Palmetto Prairie	Contains greater than 70% coverage by palmetto (*Serenoa repens*).
	SC	Scrub	Contains 70% or greater coverage by scrub oak species and other scrub species, with or without an overstory of sand pine (*Pinus clausa*).

Type	Community		Description
FU	Forested Upland		An area with greater than 70% coverage of tree species that are at least twice the height of the shrub layer, and that is saturated or inundated for less than ten percent of the growing season
	OH	Oak Hammock	Contains greater than 70% coverage by mesic oak (*Quercus* spp.) spe-
	PF	Pine Flatwoods	Contains greater than 50% coverage by *Pinus* spp.
	MH	Mixed Hard-wood	Contains mixed hardwood species, with pines and palms less than 70%.
	LV	Wooded Levees and Spoil Banks	Levees and spoil banks with surface not maintained or cleared. Often covered with *Sabal palmetto* and *Schinus terebinthifolius*.
OT	Other		
	BS	Bare Sand	Areas of >70% bare sand with no vegetation.

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EXHIBIT 2 — SURVEYOR'S QUALITY CONTROL PLAN

The Surveyor's Quality Control Plan begins on the following page.

St. Johns River Water Management District

Aerial Imagery Acquisition and Plant Community Mapping in the Floodplain of the Upper St. Johns River

Project Quality Control Plan

Prepared for:

St. Johns River Water Management District

Prepared by:

Krysia Sapeta
1935 Jamboree Dr
Suite 100
Colorado Springs, CO 80920

Vickie Larson
3245 N. Courtenay Parkway
Suite 37
Merritt Island, FL 32953

Chris Harnden
125 Tampa Ave.
Indialantic, FL 32903

February 10, 2015

CONFIDENTIAL NOTICE

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1 Introduction

The primary tasks required for this project are to acquire aerial imagery in 2015, 2016 and 2017 and use the subsequent orthoimagery product to support detailed plant community spatial data and maps of the Upper St. Johns River Basin (USJRB) floodplain for the District. Plant communities in the upper St. Johns River floodplain were mapped in 2001 (baseline) and again in 2008 – 2010. The 2008-2010 maps will be utilized as the basis of a comparison between new plant community maps.

This Quality Control (QC) Plan describes details of quality control that will be used during this project to assess compliance of digitizing standards and produce accuracy assessment reports of the map products.

Sanborn has earned an ISO 9001:2008 certification and is registered with Platinum Registration, Inc. ISO 9001, a Quality System Standard, is a series of five international standards that provide guidance in the development and implementation of a specific Quality Management System.

With Sanborn's ISO 9001:2008 certification, the St. Johns River Water Management District (District) is assured that:

- The requirements and specifications of the project have been thoroughly and rigorously evaluated and documented.
- The production processes and procedures employed for the project are appropriate and adequate to produce the results intended.
- The production processes and procedures are controlled and results will be consistent and repeatable.
- Documentation will be maintained that allows for evaluation of the processes and procedures to eliminate the source of nonconformities and to facilitate continual improvement of the processes and procedures.
- Adequate facilities are available to meet the needs of the project.
- Sufficient numbers of competent and adequately trained employees are working on the project.

All of Sanborn staff adhere to the Quality Management System and participate in regular internal and external audits to ensure that adequate and continuous control is in operation for all activities affecting product quality. This will ensure a high quality and consistent product for the District. Sanborn employs methods and techniques that foster continuous improvement and good business practice. Sanborn places an emphasis on problem prevention rather than dependence on detection after occurrence. Every effort is made to perform operations and quality-related activities correctly the first time. The Quality Management System includes a formal review of the parameters affecting product quality from conception to contractual fulfillment. Whenever necessary, corrective and preventive actions are implemented to ensure continuous improvement.

Sanborn will follow its proven ISO9001:2008 processes to ensure that all contract materials are delivered in accordance with the District's requirements. Quality control validation points are inserted into the overall program process at key points and quality assurance protocols are completed prior to submission of deliverable products.

2 Imagery Quality Assurance/ Quality Control

Sanborn takes every possible measure to ensure that mission planning, operational conditions, precision aerial cameras, and computerized flight management systems all work together to result in the acquisition of high quality, error-free imagery for the project. We quality check the entire imagery data set three times before accepting it for exploitation.

As each image is acquired, a snapshot of that image is visible to the aircrew on a monitor. Our photographers view this snapshot at the time of capture and then again post-mission, before sending the imagery to the office. Sanborn's photographers identify over 98% of the re-flights in the field through this QA process.

When an imagery data set arrives at the office, it is immediately backed up. Thereafter, it is processed to the final image. This processing occurs quickly, as dedicated, high-capacity workstations utilizing a distributed processing system are used for the task. After the imagery is processed, a technician reviews the imagery a third time. The technician looks for details which may not have been visible in the snapshot and confirms that the image processed correctly. Checks performed by the technicians include:

- Review of the imagery for density, contrast, hot spots, clarity, shadow and highlight detail, and overall quality.
- Technicians will also check each line of imagery for:
  - Adherence to the flight plan—the editor will review the imagery to ensure that the specified flight plan has been successfully executed.
  - Ground Sampling Distance (GSD)—the technicians will confirm that the specified GSD of 0.9 ft or less has been achieved.
  - Departures from flight heights required to produce the desired image scale shall not exceed minus two percent (-2%) or plus five percent (+5%).
  - Crab— Crab in excess of three degrees (3°) may be cause for rejection of a flight.
  - Tilt and Tip— Tilt of the camera from vertical at the instant of exposure shall not exceed three percent (3%), nor shall it exceed five percent (5%) between successive exposure stations. Average tilt over the entire project shall not exceed 1%.
  - Forward overlap—the forward overlap will be examined to ensure that it falls in the appropriate range averaging 60% (± 5%) for each acquisition area.
  - Side overlap—the side overlap will be examined to ensure that it falls in the correct percent range averaging 30% (±10%) for each acquisition area.
  - Anomalies—any other anomalies that could affect the final product will be examined, such as exposures settings, pixel drop out, etc.

If the technicians identify the need for any re-flights, they will immediately email the flight crew the necessary parameters. Our goal is to accomplish this review within three days of acquisition of the photography. Sanborn understands that unacceptable imagery will be re-flown at no additional cost to the District. All re-flight coverage will overlap the accepted imagery by at least two exposures, and will be captured using the same sensor type that performed the initial acquisition.

2.1 Ground Survey QA/QC

The control survey will be characterized by extensive quality control mechanisms, for example:

- Dual instrument height measurements using different units of measure, or fixed-height tripods.
- Use of redundant, quasi-independent GPS baseline in all loops; loop misclosures.

- Least squares adjustments and statistical evaluations.
- Use of multiple well distributed existing horizontal and vertical control points as the basis for the new network(s).
- Independent review and checking of all computations.
- Supplementing GPS surveys with conventional survey techniques using electronic traversing (total stations) and digital leveling for more precise vertical control.
- Full reporting of all results and the inclusion of all computations, field logs, solution printouts, and any other pertinent information provide quality assurance.

2.2 Absolute Accuracy Check Points

True verification of accuracy requires the use of independent check points – specifically, ground control points withheld from the AT process and used as checks after the initial adjustment. To meet statistical criteria via a sufficiently large sample, Sanborn typically withholds a minimum of one-fourth of the ground control points to be used as check points to verify the quality of the AT adjustment. Since AGPS/IMU will be relied upon as the primary element of control for this project, ALL ground control points may be withheld in order to generate an RMSE for all ground control against an independent AGPS/IMU solution. This process validates the AGPS/IMU as a stand-alone solution for meeting the specified project accuracy. A final AT adjustment will then be made incorporating all of the ground control to arrive at the best possible coordinates for subsequent photogrammetric operations.

2.3 Aerial Triangulation Quality Assurance/Quality Control

The quality of the aerotriangulation solution is proven by low values of the error residuals in the least squares adjustment. Very low values in the residuals indicate that the ground control is free of survey errors because it fits the photogrammetric measurements. The quality control steps outlined below will be followed to help ensure the best quality adjustment. The full and complete documentation of the quality control procedures and results will be presented in the Final AT Report.

- The project boundary will be identified to ensure that triangulation coverage includes the entire project area.
- Checkpoints will be used and evaluated as previously discussed above.
- Intermediate triangulation results will be thoroughly reviewed by the Lead Technician and the Data Processing Manager.
- Final triangulation results will be thoroughly reviewed by the Lead Technician, Data Processing Manager, and the Manager of Production.

2.4 DEM Compilation Quality Control

Sanborn's final review of the Digital Elevation Model (DEM) data will involve reviews for completeness (coverage, gaps), as well as duplicate points and other anomalies, such as spikes from points that are above or below the actual terrain surface.

The following quality control measures also help to ensure the accuracy and consistency of the final DEM:

- A set of work instructions will be created detailing the work procedures that will be performed on the project.
- The technicians will validate final ground control files from the aerial triangulation adjustment.

- A supervising technician will review a sample of the DEM models on an interim basis during production to ensure the data is being collected correctly.

3 Digital Orthophoto Quality Assurance/ Quality Control

The process involved in producing high quality digital orthophotography is dependent upon the successful execution of many tasks performed by several Sanborn departments. While QA/QC is integrated into the workflow, every orthoimage tile undergoes a thorough visual inspection by experienced imagery technicians following the conclusion of the production process. Any blemishes or artifacts in the imagery will be corrected prior to submittal. Inspections that will be performed on the orthoimagery include, but are not limited to:

- Visual inspection of geometry—Evaluate final geometric fit for compliance to specifications and/or published data quality statistics:
  - Obvious seams
  - Edgematching (roads, buildings)
  - Bridge warping
  - Excessive radial displacement in buildings
- Visual QC of mosaic—Evaluate product quality and modify as needed to meet project specifications:
  - Blurred imagery
  - Inconsistencies of color balancing
  - Artifacts removed
  - Shadow detail
- Product packaging—Final review of product with regard to content, format, labeling

Sanborn understands that imagery which does not meet quality and accuracy requirements will be rejected and will need to be re-submitted following corrective measures.

4 Process Wide Quality Assurance Checklist Overview

Sanborn uses an independent internal quality review process for all data to ensure adherence to product specifications, data formats and data completeness for all the deliverables across all phases of the contract. Sanborn spends considerable effort to ensure data quality. All data are post-processed in a controlled environment based on strict procedures, not only designed to maintain data integrity, but also to provide the best possible products to the District. As a result, we use highly controlled procedures for planning, data acquisition, post-processing, ortho-production, product generation and data delivery. The following table is an outline of the Sanborn Quality procedures across all phases of the project.

QC Checklist		Methodology
PRE-ACQUISITION REVIEW: These checks are to make sure flight-planning is done according to the contractual requirements.	Project Boundaries	Confirmed with the District by the Project Manager and released to the Acquisition Team after sign-off
	Flight Plan	Checked by Acquisition Manager and submitted to the District for review
	Sensor Settings	Checked and verified by the Acquisition Manager
	Weather conditions	Verified by the Operator

QC Checklist		Methodology
	Survey Plan	Checked and verified by the Geomatics Engineer
FIELD DATA REVIEW: These are the preliminary QC steps done by the Operator & Pilot	Flying Height Checks	Double check the flying height
	Flight Logs	Flag the flight-lines with cloud coverage and turbulence
	Sun Angle	Cross reference the sun-angle charts with the flight time
	Coverage & Overlaps	The data is checked for side and forward overlap and any coverage issues
POST ACQUISITION DATA REVIEW: These checks are to make sure that the collected data meets the contractual requirements.	Resolution	The resolution of the data is confirmed by the Lead
	Image Quality	Image free of clouds, haze, over-exposure, saturation, artifacts
	Data Voids	To ensure the coverage
	Sun Angle	The data meets the sun-angle requirements
	Overlaps	The data is checked for side and forward overlap
DATA CALIBRATION REVIEW: These checks are to ensure that the data meets the contractual accuracy requirements.	Initial Orientation Review	The initial orientation is checked for accuracy and completeness
	Control Network Review	To ensure that the control network residuals are within the error budget
	AT Accuracy Review	RMSE of the residuals on tie-points and control points
DEM SURFACE REVIEW: These checks are to ensure that the DTM data going into the orthorectification process is up-to date	Review of the Existing DEM	By surface subtraction between the old and new DEM
	Update of the DEM	The DEM is updated in the areas of change
	Horizontal & Vertical Accuracy	Check the horizontal & vertical registration between the DEM and the AT
ORTHO PRODUCTION REVIEW: These checks are performed during the ortho-production processes	Seamline Editing	All seam-lines are QCed and modified accordingly
	Smearing	The orthos are checked thoroughly for feature smearing
	Color Balancing	The Orthos are QCed and corrected for any color balancing discrepancies
	Ortho Accuracy	The ortho accuracy is checked by measuring the control and check points on the orthos
DELIVERY COMPLETENESS & FORMATTING REVIEW: These checks are to ensure that all the products listed in the contract are delivered, they are in the right formats and they completely cover the project area	Delivery Layout	Confirmed by the District and signed off by Department Lead
	Imagery Format	Confirmed by the Lead
	Horizontal Datum	Confirmed by the Lead
	Vertical Datum	Confirmed by the Lead
	Unity	Confirmed by the Lead
	Coverage Check of Deliverables	Visual checks done for each product type by Lead
	Automated Header Checks	To ensure that all products are generated for delivery in the right formats (including reports)
	Metadata	Checked by the Lead

5 Plant Community Mapping Quality Control

5.1 Introduction

Monitoring plant community responses to ongoing management activities in the Upper St. Johns River Basin (USJRB) is critical to maximizing environmental benefits through adaptive management. Baseline plant community maps of the Upper St. Johns River floodplain were completed in 2001-2003 and 2008-2010. This task was part of a plan to monitor changes in plant communities within the floodplain by creating detailed maps and spatial data for use in a Geographic Information System (GIS) analysis every six years. Since the last mapping event in 2010, there have been significant changes within the floodplain as a result of management/restoration activities, extreme weather events, and invasion of exotic and/or invasive species. Updated plant community maps will not only provide an indicator of ecological change due to these factors, but will also further our understanding of the relationships between plant community structure and hydrology, water quality, fire, and wildlife habitat.

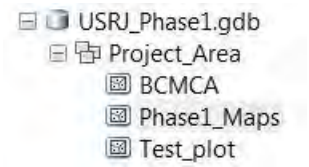
Plant community mapping will be conducted for 18 regions within the wetland corridor of the Upper St. Johns River Basin (USJRB). Maps and associated spatial data will be produced in the ArcGIS 10.1 geodatabase format, based on aerial orthophotography (to be taken in March 2015, March 2016, and March 2017).

5.2 Geodatabase Structure

All geodatabases will be produced using ESRI's ArcMap software, V10.1 format. The file geodatabase structure, with feature datasets, feature classes and geodatabase properties such as Domain, Resolution, and Tolerance defined will be submitted to the District Project Manager for approval.

A single ArcGIS file geodatabase will be produced for each Phase of the contract (i.e., USJR_Phase 1.gbd) The plant community maps for each of the project areas designated in Attachment A - Table 1 of the RFQ shall be delivered as separate feature classes within the Phase geodatabase (i.e., BCMCA).

Example file geodatabase structure:



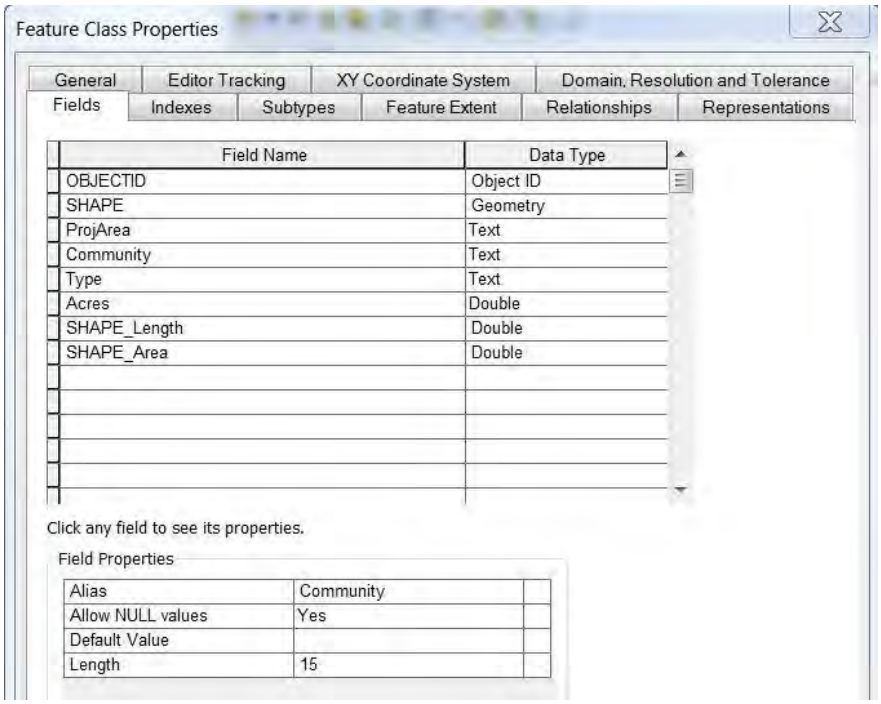
The geodatabase shall include draft domains for the non-numeric fields related to the plant communities and any other geodatabase properties determined to be useful during the data editing process.

Project area feature classes:

The project area feature classes shall reside in a single feature dataset named according to the delivery phase. Grouping of feature classes and naming convention is described in Attachment A -Table 1 of the RFQ. All feature classes shall have the following fields:

Field Name	Field Type	Field Length	Notes
ProjArea	String	15	According to Table 1 of the RFQ (e.g. FDMCA, BCMCA, etc.)
Community	String	10	e.g. SG = Sawgrass
Type	String	5	Wetland type (e.g. HW = Herbaceous Wetland)
Acres	Numeric, Double	10	

Example of geodatabase feature class properties:



Plant community features within each feature class shall have no gaps or overlaps. Project area boundaries between adjacent feature classes shall be coincident.

Combined phase feature class and metadata:

The combined phase feature class shall have the same structure as the project area feature classes, and reside as an independent feature class within the geodatabase (i.e., Phase1_Maps). Plant community features shall have no gaps or overlaps. All project area boundaries shall be dissolved. The combined phase feature class shall have metadata that at a minimum includes:

- Definitions of attribute values for each field
- Lineage and source information, including data creation dates and dates of imagery used for mapping

- A general abstract / layer description
- Information in the ESRI Item Description fields

The metadata shall be readable to users who wish to view either ESRI Item Description fields or the full ArcGIS Metadata record. Clarification can be provided by the District's Project Manager when the metadata is being populated. The final geodatabase for each Phase will be delivered, following the deliverable format requirements in Attachment A – Table 1 of the RFQ, for review and approval by the District.

5.3 Hybrid Change Detection Mapping Methods

The hybrid change detection mapping methods will use a combination of semi-automated change detection processes and traditional aerial photointerpretation via heads-up digitizing to develop the proposed plant communities map products. Change detection will begin with the 2008-2010 Plant Community maps. A feature class of the 2008-2010 Plant Community layer (received from the District) will be created within the Phase geodatabase. Prior to the start of work, all topological errors such as gaps, overlaps, and missing attributes will be fixed (Exhibit 7.1). The geodatabase feature class for the 2008-2010 Plant Communities will provide the basis for the 2015-2017 update with which a hybrid change detection process will be conducted.

Multiple change detection algorithms will be used collectively to identify change in the most comprehensive manner. Each algorithm is designed to identify a different type of landscape or vegetation change, though there will be overlap between the methods, meaning that the same change may be identified using more than one method. Preparation of the data for change detection will include creation of image derivatives such as band ratios, Normalized Difference Vegetation Index (NDVI), and texture measures.

Two change detection algorithms will be used for this project: a map-to-image process using the new 2015-2017 digital aerial imagery and a height change detection using a Digital Surface Model (DSM) created during the orthorectification of the new imagery. Both techniques will compare the current state of the plant communities, hydrological regime, and landscape as seen from the aerial sensor to the state portrayed in the 2008-2010 plant community data. These methods will complement each other and will locate and delineate the majority of the change in the project area. Although we often use an image-to-image change detection, that approach is not a viable option since the 2008-2010 (Time 1) imagery used for mapping was not orthorectified, but instead was a geo-referenced, scanned product generated from transparencies. The availability of the 2008-2010 plant community map for Time 1 in this project makes a map-to-image change detection approach more suitable. Using this process, we will retain the plant community labels from the previous mapping effort and will use a logical matrix to ensure that appropriate labels are placed in the new classification.

At this point in the process, before the change mask is finalized, the result of each change process will be compared to the imagery and the field data, by experienced photointerpreters, to ensure that the maximum amount of change has been identified by the algorithms. If small amounts of false change are identified, they will be removed during the manual phase of the update. It is far preferable to include false change (false positives) in the change map than to miss change (false negatives). This quality control step will also identify missed change, and the algorithms will be adjusted to identify the specific type of change.

Once the change detection processes are complete, a cue map will be produced by combining the results of the processes, and the map will be used to aid photointerpreters in finding and labeling features and areas that have changed in the intervening years. Once areas of change have been identified, updates will be made to the plant community data line work by the photointerpreters, either by manual delineation or incorporation of the change polygons into the dataset. Digitizing will be done on-screen employing change detection mapping techniques with the aerial

orthophotography in the background. Mapping region boundaries within a project area will not be edited, as they must match adjacent regions.

5.4 Quality Control for Geodatabases

Quality control (QC) for mapping will consist of a three-tier process to assure the compliance of digitizing with standards for positional and thematic accuracy. A QC checklist will be completed for each feature class in the Phase geodatabase; sub-region feature class, project area feature class and combined Phase feature class. The mapping supervisor will perform all QC evaluations and sign-off a QC checklist for each of the described QC levels; sub-region feature class, project area feature class, and combined Phase feature class.

5.5 Quality Control for Sub-Region Feature Classes

Each large project area may be divided into sub-regions using the project area boundary file supplied by the SJRWMD. This process will enable multiple photointerpreters to work within portions the project area simultaneously. The use of sub-regions will simplify the mapping process within large project areas (i.e., Ft. Drum Marsh Conservation Area, Blue Cypress Marsh Conservation Area, Bull Creek Wildlife Management Area, River Lakes Conservation Area, etc.). The QC checklist for sub-region feature classes will include evaluation of the positional and thematic accuracy of the GIS data and follow the example format (Exhibit 7.2). In cases where project areas are small, there will be no sub-region QC checklist.

5.6 Positional Accuracy

Line work will be checked for consistency throughout the sub-region. Digitizing parameters or tolerances for the file geodatabase in ArcMap will be set to assure positional accuracy of lines within the feature classes (e.g., vertex and edge snapping, shared features editing) and assure complete topological development of lines into polygons. A visual assessment of the line positions will be performed to assure the placement of lines within 5m of high-contrast boundary. On-screen measurements of line position, for random lines, relative to high-contrast boundaries will be performed to verify line position. Lines not meeting positional accuracy requirements will be edited by the photointerpreter and the QC process will be repeated until the line positions meet accuracy standards. We will perform a random check of a sufficient number of changed lines to be certain that 95% of those lines are within 5 m of their true location to a confidence level of 95%.

QC will also address issues of minimum mapping unit for the interpretation of high-contrast and minimal contrast boundaries (see specifications listed in section 5.7). Geodatabase topology for the sub-region feature class will be constructed and edited in ArcGIS Advanced to assure spatial accuracy. Any sub-region polygons not compliant with the QC evaluation will be edited and corrected and the QC process will be repeated until the sub-region feature class is compliant with all QC measures.

5.7 Thematic Accuracy

A visual assessment will be used to QC thematic accuracy within each sub-region. The thematic accuracy of sub-region feature class will be QCed for labelerrors. In addition, labels will be checked for correct coding using a frequency distribution generated from the attribute table. Each polygon will be checked for an accurate community label (i.e., correct alpha codes for 33 plant communities, Exhibit 7.5). QC evaluation will also review the minimum mapping requirements for the features within the frame. For features with high-contrast boundaries, QC analysis will assure that plant communities greater than or equal to 0.2 hectares (0.5 acres) or minimal width of 15 meters for elongated objects such as canals or levees are delineated. In area of low-contrast boundaries, QC

analysis will assure that plant communities greater than or equal to 1.2 hectares (3 acres) are delineated. The QC analyst will use the signature key as an overlay to verify consistency in thematic interpretation within the sub-region.

A formal accuracy assessment will be performed at the end of each mapping phase as outlined in sections 5.10-5.13. Statistics and contingency tables generated will provide the final accuracy estimates for the data.

5.8 QC for Project Area Feature Class

Sub-region feature classes will be map-joined (mosaicked) in ArcGIS Advanced to produce a project area feature class. A QC checklist will be used to evaluate each project area feature class (Exhibit 7.3). The QC checklist will focus on GIS data consistency and thematic accuracy. Edgematching will be conducted as a part of the photointerpretation process at the sub-regional level within a project area. This will be done to assure the positional accuracy of edge arcs with all adjacent data.

All sub-region boundaries will be dissolved in the project area feature class. Feature class topology will be reviewed and edited. Labelerror checks will be conducted on the project area feature class. A frequency distribution will be used on the attribute to evaluate community codes. The "Type" attribute field will be added to the attribute table using the *join item* command. The field labeled "Type" in the attribute table is a general community type based on structure and has eight (8) categories (HW – herbaceous wetland, SW – shrub wetland, FW – forested wetland, HU – herbaceous upland, SU – shrub upland, FU – forested upland, OW – open water, OT – other) .

Each final project area feature class will meet all positional and thematic mapping criteria employed by the District and the specifications of this project. This three-tier QC evaluation is designed to identify any problems in data production at an early stage so that they may be easily and quickly corrected.

5.9 QC for Combined Phase Feature Class

Project area feature classes will be map-joined in ArcGIS Advanced to produce a combined phase feature class. A QC checklist will be used to evaluate each project area feature class (Exhibit 7.3). Edgematching will be conducted as a part of the QC process at the project area level but it will be reviewed again when combining the project area feature classes. This will be done to assure the positional accuracy of edge arcs with all adjacent data.

5.10 Accuracy Assessment Report for each Phase

The same map accuracy assessment methods that were used for the previous 2008-2010 Plant Community Mapping Project will be used in the 2015-2017 project. This method uses random points stratified by map category and field-verified data to verify the accuracy of the thematic data. Assessment of thematic accuracy for the USJRB plant community maps will follow a random sampling scheme stratified by map category (Card 1982). The "Community" item will be used as the map category in the accuracy assessment.

5.11 Random Point Data Generation and Evaluation

Random points will be generated using National Oceanographic and Atmospheric Administration's (NOAA's) Sampling Design Tool for ArcGIS and stratified independently and randomly within map categories. The following describes the procedure for the generation of the random points. Points that are located within community types (i.e., polygons) with a total cumulative acreage of less than 50 acres will not be included in the accuracy assessment. A minimum of 10 points will be sampled from each plant community category within the combined phase feature class. Each point selected

for field verification will be evaluated based on its location to the nearest boundary and its accessibility in the field. Points located within 30 m of the polygon boundary will not be used except for cases in which ground features are polygons that are narrower than 30 m (e.g., canals, levees). If points are determined to be too close to the polygon boundary another random point within that community type will be selected. More than one point may occur in a large polygon as long as the points are separated by 30 meters or more. If points are closer than 30 meters apart, one will be removed or relocated.

5.12 Point Data Field Assessment

The following procedure will be used for field assessment of the random points for the accuracy assessment. Each point will be visited in the field and sampled by the procedures outlined in the Attachment A of the RFQ. The list of random points to be visited in the field will be loaded onto the GPS unit, and the points will be used to navigate to the accuracy assessment field location. The GPS coordinate generated for the point will be used as the accuracy assessment point in the field, unless exact location cannot be reached. In such cases, a point located within 10 m of the target point will be used for the assessment. Upon reaching the field location, or a new point as specified above, a new GPS position will be collected. The classification of community type will be based on the plants occurring within a 5 m radius around the GPS field location. The community class for the point will be recorded into the GPS in association with the x, y data location. A minimum of three photographs, in cardinal directions, will be taken at each accuracy assessment field point.

Five plant community classifications (Canal, ditches and borrow pits - CA, Cabbage Palm - CP, Levees with roads - LR, Wooded Levees and Spoil Banks – LV, and Open Water - OW) will be "imagery-truthed" from aerial photography versus ground-truthed because they are easily identified from aerials. Field photographs of these community types will not be required as a part of the accuracy assessment data collection.

5.13 Analysis of Field Accuracy Data

A contingency table (Table 1) will be used to estimate the accuracy of the plant community maps. Categories A through E in Table 1 represent plant community classifications for the project (n =33)). For each accuracy assessment point, the Map Category will be determined. The Map Category is the plant community identified in the photointerpretation process from the aerial imagery. While the True Category is identified by visitation of the same location on the ground. Points will be tallied in the appropriate cell in the Contingency Table. Correct points will be represented in the major diagonal, incorrect points will be represented in the off-diagonal cells. The Map Marginal Proportions are calculated from a union of the project areas for the accuracy assessment and reflect the proportion or relative size of any one plant community in the project area. A frequency distribution by community will summarize the area for each Map Category. The total area for each community class is divided by the total mapped area (i.e., recorded as a proportion).

Table 1. Contingency Table Template for Accuracy Assessment

			Map Category			
True category	A	B	C	D	E	Row Totals
A						
B						
C						
D						
E						

Column Totals						
Map Marginal Proportions						

5.14 Statistical Analyses of Accuracy Data

Maximum likelihood estimates for four probabilities of interest will be calculated; (1) marginal proportion for True Category, (2) probability correct given True Category, (3) probability correct given Map Category, and (4) overall probability correct. These calculations will directly follow Card (1982). A variance of overall probability will also be calculated to show an approximate 95% confidence interval for overall probability. The techniques outlined by Card (1982) demonstrate the use of proportional sampling based on map-category distribution to improve estimates of probabilities important to map users. It should also be noted that Card (1982) responds to concerns of statistical design, such as optimal sample size selection by declaring the estimators valid regardless of sample size, "including samples sizes arrived at by guessing".

6 References

Card, D.H. 1982. Using known map category marginal frequencies to improve estimates of thematic map accuracy. Photogrammetric Engineering and Remote Sensing 48(3):431-439.

7 Exhibits

7.1 Checklist for 2008-2010 Plant Community shapefile to geodatabase conversion and topology.

Project Area	2008-2010 Project_Area Feature Class or Shapefile	Identify topological errors	Fix topological errors	Export to 2015-2017 Phase Geodatabase
PHASE 1				
Ft. Drum Marsh Conservation Area	fdmca			
Blue Cypress Marsh Conservation Area (including Kenansville Lake)	bcmca			
Fellsmere Water Management Area	fwma			
Blue Cypress Water Management Area (including Banjo Groves, Corrigan, & Kromhout)	bcwma			
PHASE 2				
Three Forks Marsh Conservation Area	tfmca			
Sixmile Restoration Area	sixmile			
Sartori West	sartori			
Broadmoor Marsh Restoration Area/C-54 Retention Area (Goodwin Waterfowl Mgmt Area)	broadgood			
Deseret Ranch	deseret			

Sawgrass Lake Water Management Area/C1 Retention Area	sawgrass			
C1 Detention Area	c1deten			

Project Area	2008-2010 Project_Area Feature Class or Shapefile	Identify topological errors	Fix topological errors	Export to 2015-2017 Phase Geodatabase
St. Johns Marsh Conservation Area	sjmca			
Bull Creek Wildlife Management Area/Jane Green Detention Area	bullcreek			
PHASE 3				
River Lakes Conservation Area	riverlakes			
Moccasin Island Marsh Restoration Area	moccasin			
Lake Poinsett / Canaveral Marshes Conservation Area	canaveral			
Seminole Ranch Conservation Area	seminole			
Buck Lake Conservation Area	bucklake			

7.2 Checklist for Sub-region feature class.

Sub-region:

Sub-region (file_name)	Interpreter (name)	Interpret Finish (date)	QC by (name)	QC Start - Finish (dates)	Edge-matching	Line position	Polygon Size (minimum mapping unit)	Label accuracy	Build geodatabase topology	Edit geodatabase topology	Approved (date)	Final sub-region (file_name)

7.3 Checklist for Project Area feature class.

Project Area:

Project Area (layer name)	QC by (name)	QC Start - Finish (dates)	Edge-matching	Line position	Polygon Size (minimum mapping unit)	Label accuracy	Build geodatabase topology	Edit geodatabase topology	Approved (date)	Final Project Area (layer name)

7.4 Checklist for Combined Phase feature class.

Phase No:

Combined Phase (layer name)	QC by (name)	QC Start - Finish (dates)	Edge-matching	Line position	Polygon Size (minimum mapping unit)	Label accuracy	Build geodatabase topology	Edit geodatabase topology	Approved (date)	Final Combined Phase (layer name)

7.5 2015-2017 Plant Community Classification and Codes for the Upper St. Johns River Basin Mapping Project.

Type	Community		Description
OW	Open Water		
	OW	Open Water	Natural or large impounded water bodies with no floating or emergent vegetation, however, submersed vegetation may be present.
	CA	Canals, ditches and borrow pits	Small man-made water bodies.
	FF	Free-floating plants	Water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), *Salvinia* spp., and other species that are not connected to the substrate of the water body.
	HY	Hydrilla	Areas with hydrilla (*Hydrilla verticillata*) covering more than 70% of the water surface.
HW	Herbaceous Wetland		
	CT	Cattail	Contains 70% or greater coverage of cattail (*Typha* spp.). sawgrass, ferns, other herbaceous species, and small shrubs may also be prominent.
	CTSG	Cattail/sawgrass	Contains cattail and sawgrass mixes that contain less than ten percent of other species and contain 30-60% cattail with the remainder sawgrass.
	GS	Grass/sedge Marsh	Contains 70% or greater coverage of obligate (OB) or facultative wet (FACW) grass or sedge species such as maidencane (*Panicum hemitomon*), cupscale (*Sacciolepis striata*), spikerush (*Eleocharis* spp., *Rhynchospora* spp.). Other herbaceous species including sawgrass, cattail, and shrubs may be present.
	HM	Mixed Herbaceous Marsh	Consists of a combination of broadleaf emergents (e.g. *Sagittaria* spp., *Pontedaria* spp., *Petlandra* sp.) with grasses, sedges, and other herbaceous species such as *Hydrocotyle* sp., *Polygonum* spp., sawgrass, cattail, where no one species accounts for 70% or greater. Small shrubby plants (*Cephalanthus occidentalis*, *Kostelezkya pentacarpus*, and *Hibiscus* spp. are often a present.
	SG	Sawgrass	Contains 70% or greater coverage of sawgrass (*Cladium jamaicense*). Cattail, ferns, other herbaceous species and small shrubs may also be prominent.
	SM	Salt marsh/salt flat	An area where salty groundwater seeps to the surface and is characterized by the presence of one or more of the following species: sand cordgrass (*Spartina bakeri*), sea-purslane (*Sesuvium* sp.), glasswort (*Salicornia* or *Sarcocornia* sp.), marshelder (*Iva* sp.), saltbush (*Baccharis* spp.), and black needlerush (*Juncus roemerianus*). Bare soil is often a significant part of this community.
	SP	*Spartina* Marsh	Contains 70% or greater coverage of sand cordgrass (*Spartina bakerii*), with soft rush (*Juncus effuses)* and other shallow water, short hydroperiod plants as minor components.
	WL	Water Lilies	Contains 70% or greater coverage of bottom-rooted species with floating leaves including water lily (*Nymphaea* spp.), spatterdock (*Nuphar luteum*), and lotus (*Nelumbo* spp.). Also may contain bladderworts (*Utricularia* spp.)
	WP	Wet prairie/wet pasture	A mix of herbaceous species that are typical of short hydroperiod wetlands with most plants classified as facultative wet (FACW) or facultative (FAC). Similar to mixed herbaceous marsh except that long hydroperiod species should not be present, while *Spartina bakeri* and *Juncus effusus* may be present as minor components (less than 30%). This category should also be used for former pastures that have been reflooded and for wet, unimproved pastures.

Type	Community		Description
SW	Shrub Wetland		In general, the shrub layer must be twice as tall as the herbaceous layer but less than half the height of the tree layer in order to be readily detectable using a stereoscope without resorting to stereoscopic height measurements.
	WS	Willow Swamp	Contains 70% or greater canopy coverage of willow (*Salix caroliniana*), that is at least twice as tall as the herbaceous layer.
	LU	Ludwigia	Contains 70% or greater canopy coverage by *Ludwigia peruviana* that is at least twice as tall as the herbaceous layer.
	MS	Mixed Shrub Swamp	Contains a mixture of shrub species (e.g. *Myrica cerifera*, *Salix caroliniana*, etc.) and/or trees that are at least twice as tall as the herbaceous layer. Tree species such as red maple (*Acer rubrm*) should be either less than twice as tall as the shrubs, or be less than 30%.
	TS	Transitional Shrub	Contains 70% or greater cover of species found in areas with shorter hydroperiods than in Mixed Shrub or Willow Swamps and is characterized by the presence of wax myrtle (*Myrica cerifera*), saltbush (*Baccharis* spp.), Brazilian pepper (*Schinus terebinthifolius*) or other FAC shrub species.
FW	Forested Wetland		
	CY	Cypress Swamp	Contains 70% or greater cover by *Taxodium* spp
	HS	Hardwood Swamp	Contains 70% or greater coverage of mixed wetland tree species such as red maple (*Acer rubrum*), black gum (*Nyssa* spp.), and ash (*Fraxinus* sp.), which are tolerant of fairly long hydroperiods and water depths.
	HH	Hydric Hammock	Contains 70% or greater coverage of mixed wetland tree species associated with depressions having moderately long hydroperiods, such as *Nyssa* spp., *Ulmus americana*, and wetland *Quercus* spp.
	CP	Cabbage Palm Hammock	Hammocks consisting of more than 70% Sabal palmetto, which may occur in hydric to mesic conditions.
	TI	Tree Island	Relatively small patches of trees within the marsh (tree islands), consisting of mixed wetland tree species which may include red maple (*Acer rubrum*), cabbage palm (*Sabal palmetto*), dahoon (*Ilex cassine*), and pond apple (*Annona glabra*). Islands may be surrounded by a narrow border of shrubs.
HU	Herbaceous Upland		
	DP	Dry Prairie	Contains greater than 70% coverage of mixed upland grasses, herbs, etc. with few to no trees.
	PA	Pasture	Similar to dry prairie but with evidence of maintenance by humans (fence lines, structures, water troughs, etc); on the ground diagnosed by the presence of introduced and cultivated grass species.
	RC	Row Crop / Orchard	Contains 70% or greater coverage by cultivated species with evidence of arrangement in rows, with or without drainage ditches. Includes orchards or groves and fallow fields.
	LR	Levees with roads	Levees with surface maintained for vehicles, either mowed, gravel or paved.
SU	Shrub Upland		An area with greater than 70% coverage of woody species that are at least twice the height of the herbaceous layer, but less than half the height of the tree layer and that is saturated or inundated for less than ten percent of the growing season.
	PP	Palmetto Prairie	Contains greater than 70% coverage by palmetto (*Serenoa repens*).
	SC	Scrub	Contains 70% or greater coverage by scrub oak species and other scrub species, with or without an overstory of sand pine (*Pinus clausa*).

Type	Community		Description
FU	Forested Upland		An area with greater than 70% coverage of tree species that are at least twice the height of the shrub layer, and that is saturated or inundated for less than ten percent of the growing season
	OH	Oak Hammock	Contains greater than 70% coverage by mesic oak (*Quercus* spp.) species.
	PF	Pine Flatwoods	Contains greater than 50% coverage by *Pinus* spp.
	MH	Mixed Hardwood	Contains mixed hardwood species, with pines and palms less than 70%.
	LV	Wooded Levees and Spoil Banks	Levees and spoil banks with surface not maintained or cleared. Often covered with *Sabal palmetto* and *Schinus terebinthifolius*.
OT	Other		
	BS	Bare Sand	Areas of >70% bare sand with no vegetation.

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EXHIBIT 3 — SURVEYOR'S WORK PLAN

The Surveyor's Work Plan begins on the following page.

St. Johns River Water Management District

Aerial Imagery Acquisition and Plant Community Mapping in the Floodplain of the Upper St. Johns River

Project Work Plan

Prepared for:

St. Johns River Water Management District

Prepared By:

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February 6, 2015

Table of Contents

1 PURPOSE OF THE WORK PLAN

This detailed work plan is provided to formalize explicit requirements and logistics for the **SJRWMD Aerial Imagery and Plant Community Mapping** project. This work plan describes detailed requirements for the approach proposed by Sanborn. This work plan will be utilized to monitor progress and reference deliverables, milestones, tasks and responsibilities for both **St. Johns River Water Management District (The District)** and **Sanborn** staff throughout the lifetime of the project.

2 PROJECT SCOPE

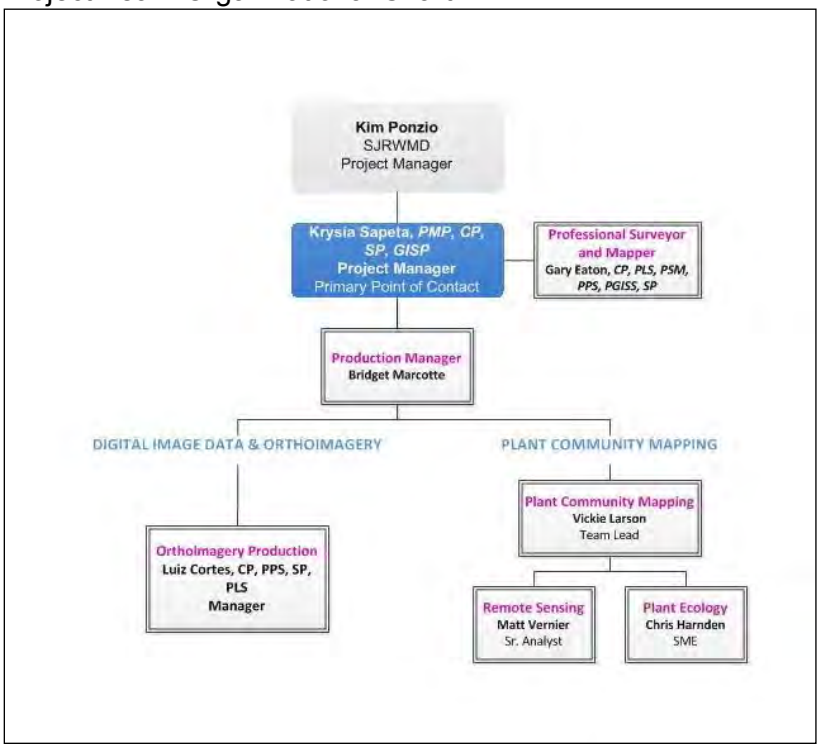
The objectives of this work plan are to:

- Clearly define the scope for both the DISTRICT and Sanborn project team members;
- Provide a detailed description of the phases, tasks and sub-tasks;
- Define responsibilities for team members for specific tasks;
- Define assumptions, potential risks, and techniques to be used to manage risks associated with each task;
- Define the quality assurance techniques and responsibilities for each task;
- Define the explicit deliverables for each task;
- Provide a project management framework for project staff to follow; and
- Define a schedule for project tasks to be completed.

3 PROJECT CONTACTS

The following chart depicts the roles and reporting responsibilities of the project team members.

Project Team Organizational Chart



3.1 St. Johns River Water Management District Contacts

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4 PROJECT AND PRODUCT DEFINITION

4.1 Description and Project Background

The primary tasks required for this project are to acquire aerial imagery in 2015, 2016 and 2017 and use the subsequent orthoimagery product to support detailed plant community spatial data and maps of the Upper St. Johns River Basin (USJRB) floodplain for the District. Plant communities in the upper St. Johns River floodplain were mapped in 2001 (baseline) and again in 2008 – 2010. The 2008-2010 maps will be utilized as the basis for a comparison with newly-collected imagery to create new plant community maps.

For this project, the Sanborn Team has developed a semi-automated approach that utilizes imaging technology, change detection, and manual interpretation to produce plant community maps within the required resolution, accuracy, budget, and scope. Multiple sources of imagery were considered during the development of this approach and it was determined that R,G,B,NIR imagery from a fixed wing aircraft is the best technology to produce one-foot, 4-band orthoimagery.

Phase 1 Solution: UltraCam Eagle Aerial Imagery
The Sanborn team recommended that aerial imagery captured with the UltraCam Eagle would most efficiently meet the District's specifications for this project for the following reasons:

- Timeliness: Aerial imagery can be collected in the optimal timeframe since flight crews can mobilize quickly when weather conditions are appropriate. In comparison, imagery collected from a satellite may not be captured during appropriate weather conditions and may be occluded by cloud cover, smoke or haze, and could be captured when the angle of the sun is suboptimal. A hyperspectral platform could theoretically be mobilized with the same flexibility as the aerial platform, depending on the vendor (Sanborn does not own a hyperspectral sensor, and would need to find an experienced owner/operator).
- Consistency: Sanborn's image collection and processing procedures and extensive experience will ensure that the imagery is radiometrically consistent and spatially accurate across the project area. In comparison, while satellite imagery offers consistent radiometry, hyperspectral imagery products can be more variable across a large project area.
- Resolution: Using the UltraCam Eagle camera, we can collect imagery at the desired 1 foot spatial resolution for the project. The best WorldView-2 satellite imagery is 1.51 feet (pan-sharpened imagery, native multispectral resolution is 6 feet), while hyperspectral imagery is generally available with a sub-meter resolution (0.1 feet for the AISA Eagle sensor flown at 1000 ft AGL). However, the cost for hyperspectral imagery is cost-prohibitive for this project.

- Cost and History: The acquisition of aerial imagery using the UltraCam Eagle is currently the most cost efficient and historically proven methodology for the plant community identification.

Satellite Imagery Option
The Sanborn team discussed incorporating satellite imagery, specifically WorldView-2 imagery from DigitalGlobe, into the analysis to map additional species, such as multiple levels of Carolina willow (Salix spp.), and exotic and invasive plants such as the West Indian Marsh Grass, Paragrass, Phragmites australis and Lygodium spp. WorldView-2 imagery can provide additional spectral bands to help discriminate the target species and communities. The sensor has several unique bands that could provide valuable information regarding wetland species: a “Red edge” band, between the standard red and infrared portions of the spectrum, and a “Coastal” band, which is slightly in the ultraviolet portion of the spectrum and can assist in the discrimination of wetland types.

After careful consideration, WorldView-2 imagery was not chosen because of the uncertainty of capturing cloud-free images during the short time-frame identified for this project (Feb 15th to Mar 15th). The WorldView-2 platform has a fast revisit time, but is not as flexible as an airborne platform. Since an airborne platform has more scheduling flexibility, the team decided that it was the best option to gather cloud-free imagery. Satellite imagery may be a good supplemental source to discriminate species and could be added in the subsequent years of the project.

Hyperspectral Imagery Option
The Sanborn team also discussed the inclusion of hyperspectral imagery in the analysis, but decided that it was too problematic and expensive for this project. Hyperspectral imagery would provide many of the same discriminating capabilities as WorldView-2 satellite imagery, and can potentially provide even more information, depending on the chosen sensor. However, it can be extremely variable in terms of color balance that may reduce interpretive consistency throughout the project area. In addition, the effort required to overcome this issue would be well outside the budget for this project. Hyperspectral imagery may provide added value to the project in subsequent years, in terms of improved discrimination of plant communities and species. However, that would be considered as a separate project.

Conclusion
For Phase 1 of this project, Sanborn decided that WorldView-2 satellite and hyperspectral imagery collection would not meet budgetary constraints. However, it is recommended that one or both of these options be tested at a later date to advance the capabilities of plant species identification. If the District desires to pursue some or all of the options at a later date, the Sanborn team has the ability to incorporate either option, as part of an expanded scope of work.

4.2 Documentation Requirements

Documents will be maintained on a password controlled SharePoint site where all documents and data will be stored. This site will be used to facilitate communication and version control. The SharePoint site is TBD. All team

members will have individual passwords that will be provided via email. An ftp site for large data files has been set up at ftp.sanborn.com.

4.3 Acceptance Criteria

To ensure that all team members are clear on the content of a specific deliverable, formal specifications are defined for each deliverable of the project. Once the deliverable is completed and has undergone internal quality control testing, a formal review process will be undertaken with the District to ensure that it meets their expectations. The specifications are used as the criteria for acceptance. Once all comments are received, and revisions completed (if required), formal acceptance of the deliverable is required.

4.4 Product Delivery Mechanism

Orthoimagery data will be provided to the District on an external hard drive. Data and documents will be delivered via SharePoint and ftp (the latter will be used only when the size of a document makes it too large for the SharePoint site). Printed documents will be provided on request. Emailed documents pertaining to project management and project specifications will be stored on the SharePoint site to facilitate version control. If deliverables are larger than the maximum allowable size on SharePoint, such deliverables may be submitted via ftp site or by mailing media. Hard copy maps of each project area and Phase will be delivered in a format agreeable to the District Project Manager.

5 DETAILED DESCRIPTION OF PROJECT TASKS

This section of the work plan provides a detailed description of:

- The tasks and subtasks to be undertaken;
- A definition of assumptions and risks for all tasks; and
- A definition of deliverables to be provided by both the District and Sanborn.

5.1 Overview of Tasks

The contract is divided into three distinct work phases, one each year to encompass approximately 471 square miles.

- 127.8 square miles Phase 1
- 137.5 square miles Phase 2
- 204.6 square miles Phase 3

Each phase is further divided into USJRB Project Areas (18 total).

Our approach involves the following tasks for each year and for the final project close-out:

- Task 1: Project Management
- Task 2: Digital Aerial Imagery
- Task 3: Orthorectification and Mosaic Compilation
- Task 4: ArcGIS Plant Community Maps and Annual Reports
- Task 5: Final Contract Report

5.1.1 Task 1: Project Management

Sanborn's project management approach rigorously applies the Project Management Institute (PMI) model, which exceeds the requirements of

ISO 9001:2008. Sanborn understands that an upfront investment in planning results in the best outcome for the entire project lifecycle. The PMI model encompasses the following knowledge areas and process phases:

- Integration
- Scope
- Time
- Cost
- Quality
- Human Resources
- Communications
- Risk
- Procurement

Sanborn's Project Manager, Ms. Krysia Sapeta, CP, PMP, SP, GISP, will be the District's single point of contact and will serve as the District's liaison with Sanborn operations staff and management. Ms. Sapeta will be responsible for project definition and production oversight, quality management, and financial and contractual management. Sanborn's project management approach encompasses best practices of the Project Management Institute, which are applied to meet or exceed the requirements of ISO 9001:2008.

Task Overview

Project Management involves all activities that are performed to ensure smooth implementation of the project. Any changes in methodology are also identified throughout this process and documented.

Task Steps

1. **Project Work Plan:** Sanborn starts every project with a project work plan. The project work plan contains the detailed design of the project including scope of work. The work plan is considered a living document that acts as the roadmap for client, project managers and team members. It is updated on a regular basis throughout the life of the project as changes or modifications are required. The work plan details communication protocols, quality control procedures, project team organization along with a breakdown of tasks and subtasks associated with project implementation. All assumptions, risks and risk mitigation and contingency plans associated with tasks and the roles and responsibilities of various team members are provided in the work plan.
2. **Kick-Off Meeting:** During this face-to-face meeting at the District Headquarters (or other location determined by the District), Sanborn will go over all the aspects of the work plan and finalize all elements of source imagery, final plant community classification procedures and project specifications. Procedures for change management and issue management will also be discussed at the kick-off meeting. We have planned for an onsite face-to-face kick-off meeting at the commencement of the project and propose other meetings be held via web conferences or at District facilities during the signature key development phase or as needed.

3. **Project Schedule:** A project schedule will be developed and details of the schedule will be adjusted and refined as tasks proceed.
4. **Regular Project Status Tracking –** Regular project updates will be provided to the District by the Project Manager in various ways:
   Written Status Reports **–** Ms. Sapeta will submit monthly Project Status Reports to provide Project Team members with a common understanding of the important issues, procedures, and goals associated with the project. The report summarizes project activities completed over the past reporting period and those planned over the next similar time period.
   Status Calls **–** Regularly scheduled calls can also be held with the District to coordinate project activities and to review open issues noted in the status report. It is the Sanborn project manager's responsibility to facilitate this call, document new actions, address the status of open issues, and assign action items.
   Project SharePoint Site - A secure Microsoft SharePoint site be developed to serve as an online repository for all documents that the project team creates. All interim and final deliveries of data are posted on this site but may be subject to size limitations.
   Delivery Acceptance: To ensure that all team members are clear on the content of the specific deliverable, formal specifications are defined for each deliverable in the project. Once the deliverable is completed and has undergone internal quality control, a formal review process will be undertaken with the District to ensure that it meets their expectations. The specifications are used as the criteria for acceptance. Once all comments are received, and revisions completed (if required), formal acceptance of the deliverable is required.
5. **Financial Schedule:** Sanborn will work with the District on a mutually agreeable financial schedule and invoicing plan that is based on a task-completed payment system. Ms. Sapeta will be responsible for the timely and accurate submission of invoices to the District. The District is obligated to remit timely and accurate payments in accordance with the terms and conditions of the contract.

Task Assumptions and Risks

1. The District facilities will be made available for onsite meetings.
2. The District will be available for meetings.
3. The District will review deliverables in timely manner according to the RFQ.
4. The District will submit payment in accordance with the terms and conditions of the contracts.

Risk Management

1. Meetings will be scheduled with sufficient advance notice to ensure that facilities are available.
2. Meetings will be scheduled at a regular time and such meeting times will be adhered to as much as possible.
3. Sanborn will keep the District apprised of schedule status
4. Sanborn will keep the District apprised of invoice status.

Contingency Plans

Will be developed as needed

Responsibilities
Sanborn will undertake the tasks mentioned above.
The District will be responsible for providing:

1. Comments on draft and final work plan within five business days. Likewise the District will provide input on meeting notes, status reports, etc. in a timely manner.
2. Facilities for any onsite meetings.

Task Target Completion Date
Duration of Project

Quality Assurance

1. External review by the District and acceptance of monthly reports;
2. Internal weekly reports to CEO of Sanborn;
3. Monthly meetings and reviews of schedules with CEO of Sanborn;
4. Quarterly financial and schedule reviews with CEO of Sanborn; and
5. External ISO audit of Sanborn's project management process.

Deliverables

1. Kick-off Meeting Notes
2. Updated Work plan
3. Status Meeting Notes
4. Project Document Site

5.2 Technical Scope of Work

There are three Phases in this project. Each phase consists of the same four production tasks. This work plan details each task of Phase 1 and will be repeated for Phase 2 and Phase 3.

5.2.1 Task 2: Digital Aerial Imagery

Task Overview
Sanborn will collect imagery with a 1-ft pixel resolution in four bands (Red, Green, Blue and near infrared). This type of imagery is the most appropriate for photointerpreters to classify plant communities, but it also provides information that can be leveraged in a remote sensing environment for automated image processing. This is discussed in detail in the section on Plant Community Mapping.

To remain consistent with previous mapping efforts and instructions provided in the RFQ, Sanborn will collect imagery between February 15 to March 15 within a ten-day window for each year from 2015-2017. All work related to imagery acquisition and orthoimagery production will be done under the direct supervision of a Florida Professional Surveyor and Mapper (PSM). All digital orthophotos and digital mosaics will be created from the raw digital image data and shall conform to the standards set forth in the Florida Baseline Specifications for Orthophotography and LiDAR, except where noted; (http://www.floridadisaster.org/gis/specifications/Documents/BaselineSpecifications_1.2.pdf) and also conform to the specifications provided in the RFQ #28099.

Task Steps

1. Sanborn will acquire raw digital image data that meets the following specifications:
   - Weather Conditions: Imagery will be collected in calm, clear, cloud-free conditions and with a visibility of at least seven miles, and free of clouds/shadows, smoke, fire, and haze.
   - Timeframe for Acquisition: Collection will take place between February 15 and March 15 each year. We will provide email notification to the District's Project Manager 24 hours prior to the flight and also submit a detailed flight report within 24 hours of the completed mission. Images will be taken when the sun angle is between 30° and 65° above the horizon (approximately 9:30 –11:30 a.m. and 2:30 – 4:30 p.m.) because shadows from trees are important diagnostic characteristics.
   - Resolution: All raw imagery shall have a nominal ground sample distance not to exceed 0.9 feet.
   - Flight Lines: The flight lines will be oriented in a direction for efficiency of coverage and to minimize bi-directional illumination with overlaps of 60% forward and 30% side overlap.
     Flight lines will cover the target areas with spacing such that the appropriate overlap is obtained to allow viewing and mapping within required tolerances. We will provide the District Project Manager with the Flight lines at least five business days prior to commencement of flights for review and approval. Final mission details will also be submitted to the District staff prior to flying.
   - Bands and radiometry: All imagery will be acquired in a four-band digital format. A four-band stack including blue, green, red, and near-infrared bands shall be delivered to the District. Raw imagery shall be processed so the images consist of a color- and tone-balanced radiometry. There will be no geometric misalignment of bands as long as the aerial triangulation (AT) and Digital Elevation Model (DEM) is accurate. Sanborn reviews all seamlines to ensure there is no geometric offset.
   - Exposure: The sensor allows for manual exposure settings. The operators will ensure that the sensors are properly calibrated so that vegetation is neither underexposed nor overexposed.
   - Image quality: The final imagery shall be free of noticeable vignetting and shall have minimal sun spot and washout.
2. Survey
   - While Airborne Global Positioning System (AGPS) and inertial measurement unit (IMU) technology will serve as the primary means for geo-referencing, a framework of ground control is needed to serve as checkpoints and to enhance the control solution. Ground checkpoints will be photo-identified or targeted as needed by Sanborn. Ground control data shall be submitted to the District Project Manager in the Mission Plan prior to the flight. AGPS Static and Fast Static control network forms the backbone of all location surveys. Sanborn has extensive experience in designing, processing, and adjusting large control networks, and with the coordinate systems on which they are based.

- Sanborn has reviewed the District's requirements for survey control, and will ensure that survey operations result in the establishment of control that meets these specifications. A high level of redundancy will be maintained between baselines on all primary networks. Reliability of point positions that have redundant base lines and can be adjusted within a network is stronger than points observed using non-redundant RTK techniques.
- AGPS: The Microsoft/Vexcel UltraCam Eagle digital camera system utilizes airborne GPS (AGPS) and inertial measurement unit data (IMU) as input for sensor positioning and exterior orientation development. Sanborn's new Applanix Type 46 Non_Itar IMU's, acquired early in 2013 as part of our sensor modernization program, will be used to manage and collect data for this process. Novatel Millenium DL4+ dual frequency GPS receivers collecting P-code pseudo range and L1/L2 carrier signals at a sampling rate of 2 points per second will be used in the aircraft to collect GPS data. Prior to demobilizing, Sanborn shall check to ensure that there are no gaps or missing values in the AGPS/IMU data. Sanborn will support the acquisition with GPS base stations that conform to the industry standard for ground-located verification points.

3. Aerial Triangulation
   - Sanborn will use Inpho's Match-AT software to perform automatic AT. We believe this to be the most evolved aerial triangulation solution available, and has a proven track record on projects of similar size and scope. Verification of results and measurement of ground control and check points will be performed using the Match-AT module as well. Match-AT includes bundle block adjustment module which performs least squares block adjustment after automatically matched points are generated and manual measurements are completed. Software has built in tools to flag and eliminate blundered observations.
   - Stereo imagery (or oriented images) will be suitable for stereo viewing with a photogrammetric workstation and Earth Resources Data Analysis System (ERDAS) Stereo Analyst for ArcGIS.

Task Assumptions and Risks

1. Weather conditions meet the requirements stated above.
2. Acquisition equipment is operational.
3. Imagery meets the requirements as stated above.
4. The District will review deliverables in timely manner according to the RFQ.

Risk Management

1. Sanborn will track the weather conditions to ensure that we take advantage of time periods that meet the requirements stated above.
2. Sanborn has sufficient aircraft and sensors to complete the acquisition.
3. Sanborn has staff on the aircraft reviewing the imagery as it is flown, and staff completes another review of the imagery before the aircraft leaves the area. Sanborn will provide a detailed flight report within 24 hours of the completed mission to the District.
4. Sanborn will also make sure to keep the District apprised of the timeline.

Contingency Plans
Sanborn has sufficient aircraft and sensors to complete airborne data acquisition in early spring of each year. Any of the aircraft listed in the RFQ could be tasked for the project. The listed aircraft are equipped with gyro-stabilized mounts, computerized flight management systems, and AGPS/IMU systems for precise photo center positioning and orientation.

Responsibilities
Sanborn will complete tasks described above.
The District will:

1. Provide feedback and review of the flight plan.
2. Review deliverables in a timely manner as described in the RFQ.

Task Target Completion Date
Acquisition of imagery must be captured between 2/15-3/15 within a 10-day window for each Phase year. Orthoimagery deliverables have a target completion date of April 15th and no later than May 1st of each Phase year.

Quality Assurance
Sanborn maintains rigorous Quality Assurance and Quality Control; see Quality Control Plan.

Deliverables
Sanborn will provide a copy of all deliverables as outlined below.

1. Mission Details, Ground Control, and Aerial Triangulation Reports.
2. Raw, digital image data of the target area in uncompressed GeoTIFF file format and compressed SIDs or JP2 format with valid projection header information. Raw imagery shall be processed so the images consist of a color- and tone-balanced radiometry.
3. Ground control and aerial triangulation report reviewed and signed by Mr. Gary Eaton, PSM.

The District will provide:

1. A shapefile of the area of interest (AOI).

5.2.2 Task 3: Orthorectification and Mosaic Compilation

Task Overview
Individual digital orthophotos and orthophotography mosaics shall include all of the imagery from the target area for each Phase in one 4-band mosaic. A metadata file that includes information on the processes used to create the orthophotos and the digital mosaic shall be included.

Task Steps

1. Rectification of imagery.
2. Ortho Quality Review - random sample of rectified images will be reviewed.
3. Color balancing - rectified imagery will be color balanced so the project has a consistent color across project area.
4. Auto Seams – rectified/color balanced imagery will be seamed together using an Auto Seam process.

5. Seam Edits.
6. Mosaic- Seamed areas will be mosaicked.
7. Ortho QC.
8. Extraction.
9. Final Product Review.

Task Assumptions and Risks

1. Required personnel will be available.
2. Required inputs meet requirements.
3. District staff available to review deliverables.

Risk Management

1. Sanborn will develop a schedule to ensure personnel are available.
2. Sanborn conducts QC at all stages in the process and inputs will be reviewed before the process begins.
3. Sanborn will keep the District apprised of the timeline.

Contingency Plans

Sanborn has production personnel and equipment in two offices that can meet the requirements to complete the work in the event that one of the offices is not available as scheduled.

Responsibilities

Sanborn will take on tasks described above.
The District will:

1. Review deliverables in a timely manner as described in the RFQ.

Task Target Completion Date

See Appendix B for list of Contract Deliverables and Time Frames.

Quality Assurance

Sanborn maintains rigorous Quality Assurance and Quality Control; see Quality Control Plan.

Deliverables

Sanborn will provide:

1. Stereo-pairs of imagery.
2. Project areas are to be made up of a collection of 5000-ft-by-5000-ft cells that serve as the tiling scheme for orthophoto deliverables. Resolution will be 1.0' GSD GeoTIFF (and .tfw) and SIDs or JP2 Orthos.
3. Individual georectified, orthoimagery as GeoTiff files (.tiff and .tfw) and compressed files in SIDs or JP2 format.
4. Orthoimagery as GeoTiff files (.tiff and .tfw) and compressed files in SIDs or JP2 format, including one, 4-band projectwide mosaic
5. Orthoimagery checkpoint data as an ArcGIS File Geodatabase (.gdb) and coordinating survey and accuracy report on checkpoints (.pdf).
6. A single metadata file (.xml format) for each phase that is compliant with the Federal Geographic Data Committee's (FGDC) Content Standard for Spatial Metadata in an ArcCatalog compatible XML format. At a minimum, the metadata shall include the following information:
    a. Image collection date and time (ET).

b. Sensor description.
c. Processing software and methodology for imagery acquisition.
d. Positional accuracy and procedures used to determine accuracy.
e. Processing methodology for rectification of imagery used to create the digital mosaic.

The District will:

1. Review deliverables and provide an acceptance letter.

5.2.3 Task 4: ArcGIS Plant Community Maps and Annual Reports

The Project Team acknowledges the following objectives for the plant community mapping portion of this project are to:

- Create ArcGIS maps, with comprehensive metadata, showing the distribution of the 33 plant communities found in the Upper St. Johns River Basin;
- Produce ArcGIS files necessary for use in spatial analyses of change in plant community distribution, including complete metadata; and.
- Provide an Annual Report for each project Phase and one Final Report (n=4) that describes the methodology used to assess the accuracy of the mapping effort and a graphical and textual analysis of the distribution of plant communities.

The Project Team will use a hybrid (or semi-automated) technical approach which incorporates both digital image processing and traditional mapping techniques to update the 2008-2010 plant community data. The hybrid approach uses a combination of semiautomated change detection image processes and traditional change detection aerial photointerpretation via heads-up digitizing to develop the proposed plant communities map products. The hybrid approach provides the basis for future implementation of enhanced image processing techniques (e.g., image to image analysis, potential integration of hyperspectral).

Use of automated image processing increases efficiency in detecting plant community change (e.g., output is more consistent than human evaluation) Our methodology harnesses the power of automated classification to enhance and help in the work of experienced photointerpreters who will manually delineate areas of change not performed by the automated image processing.

Rather than rely on one change detection approach, we will use multiple change detection algorithms collectively to identify change in the most comprehensive manner. This multi-faceted change detection will be discussed in the detailed tasks below. Once areas of change have been identified, updates will be made to the plant community data line work by an experienced aerial photointerpreter, either by manual delineation or incorporation of the change polygons into the dataset. In either case, the accuracy of the update will be checked by an experienced analyst.

Spatial and Thematic Map Project Standards

Plant Community mapping products will be produced using ESRI ArcGIS v10.1. Only areas that have a plant community classification that is different from the 2008-2010 Plant Community maps will be updated. Minimum mapping units shall vary with the plant communities being delineated. We will map distinct plant communities to a minimum mapping unit of about 2000 m^2 (0.5 acres) or minimum width of 15 meters for elongated objects such as canals and levees. Communities with ill-defined boundaries (forming ecotones or interdigitating with

other communities) will be mapped to a minimum mapping unit of 12,000 m^2 (three acres). Positional accuracy of the lines will be within 5 meters of the community boundary as interpreted from the imagery, and topological editing (i.e., check for gaps and overlaps) will be conducted prior to product delivery. All methods will be documented and repeatable. Complete metadata for imagery will be generated and metadata for plant community maps will be updated from 2008- 2010 metadata. All technical information will be reported in each annual and final project report.

At a minimum, classification and labeling of the data will use the 33 plant communities classification scheme provided in the RFQ.

All deliverables will go through comprehensive quality control to ensure compliance with the required spatial and thematic accuracies. Each product will be delivered in a draft format to the District for review and then as a final version that incorporates comments by the District.

Geodatabases and Metadata

Plant community maps shall be delivered as separate layers, one for each of the project areas and as a combined Phase layer as defined in the RFQ. The format shall be feature classes within a single ArcGIS file geodatabase. Geodatabases will be developed in ESRI ArcGIS v10.1. The XY coordinate system of the geodatabase layers shall be NAD 1983 HARN UTM Zone 17N. Details of the geodatabase QC process for each feature class will be provided in the required Quality Control Plan deliverable. The empty geodatabase including draft domains for the non-numeric fields related to the plant communities, and any other geodatabase properties determined useful during data editing, will be provided to the District Project Manager for approval as defined in the project schedule.

Project area feature classes:

The project area feature classes shall reside in a single feature dataset, named according to the delivery phase and as described in the RFQ. Plant community features within each feature class shall have no gaps or overlaps. Project area boundaries between adjacent feature classes shall be coincident. All feature classes shall have the following fields:

Field Name	Field Type	Field Length
ProjArea	String	15
Community	String	10
Type	String	5
Acres	Numeric, Double	10

Combined phase feature class:

The combined phase feature class shall have the same structure as the project area feature classes but all project area boundaries shall be dissolved. A frequency distribution of the community codes will be used as one part of the QC to evaluate code accuracy.

Metadata for the combined phase feature class will include at a minimum:

- Definitions of attribute values for each field
- Lineage and source information, including data creation dates and dates of imagery used for mapping

- A general abstract that describes the layer
- Information in the ESRI Item Description fields

The metadata shall be readable to users who wish to view either ESRI Item Description fields or the full ArcGIS Metadata record.

Task Overview

As stated above this task involves a hybrid approach and has the steps as detailed below in the task steps.

Task Steps

1. **Signature Key Development and Ground-Truthing**

   Procedures for developing a signature key for each Phase of the project will be determined jointly with the District Project Manager and will follow all procedures stated in the RFQ unless specified here. During the process of signature key development, the District's Project Manager may accompany the Surveyor to the field, with at least 48 hours notice to the Surveyor. All GIS data will be developed in an ArcGIS geodatabase format which will eliminate file conversions from shapefile formats. Selected signature key points will be developed as a point feature class in a geodatabase and transferred to a differential Trimble Geo XT GPS using ArcPad. This point feature class will serve as a target location for navigation to the signature key point. The exact location of the signature point will be collected in the field into a new signature key feature class. This point will represent the location in which species composition and abundance data are recorded in a field notebook and photographs are taken. At least three photographs shall be taken at each point and shall be labeled with the date, the unique identifier assigned to the point, and the cardinal direction of the camera. The signature key shall be complete 60 days following the acquisition of imagery.

   Members of the Project Team shall visit the areas to be mapped as needed during the entire mapping process, to increase their familiarity with the plant communities present and to increase their ability to map these accurately. All ground truthing data will be collected consistent with the process described in the QC Plan.

2. **Test Plot**

   The Project Team will complete one test plot (approximately 1,000 acres selected by the District Project Manager) and associated accuracy assessment, within 30 days from the date of the signature key deliverable for each project phase. Thematic accuracy of the test plot will be assessed by field checking at least 20 random points selected by the District Project Manager. The Project Team and the District Project Manager will visit the field points together. The completed test plot will be examined by the District for positional and thematic accuracy and accepted or rejected within two weeks. If the test plot does not meet the accuracy standards, additional quality control measures will be developed to insure that all final products meet the required standards. The test plot will be revised, applying additional quality control measures, and resubmitted within two weeks. The Project Team understands that

classification of plant communities in the test plot must comply with thematic accuracy standards for work to proceed.

3. **Change Detection (2008/2010 to 2015/2017)**
   The Project Team will use a map-to-image change detection process to produce a cue map to aid aerial photointerpreters in finding and labeling features and areas that have changed in the intervening years. This involves multiple algorithms, each designed to identify a different type of landscape or vegetation change. Preparation of the data for change detection will include creation of multiple image derivatives, such as band ratios, Normalized Difference Vegetation Index (NDVI), and texture measures.

   Two change detection algorithms will be used for this project: a map-to-image process using the new- 2015-2017 digital aerial imagery and a height change detection using a Digital Surface Model (DSM) created during the orthorectification of the new imagery. Both techniques will compare the current state of the plant communities, hydrological regime, and landscape as seen from the aerial sensor to the state portrayed in the 2008-2010 plant community data. These methods will complement each other and will locate and delineate the majority of the change in the project area. Although we often use an image-to-image change detection, that approach is not a viable option since the 2008-2010 (Time 1) imagery used for mapping was not orthorectified, but is a geo-referenced, scanned product generated from transparencies. The availability of the 2008-2010 plant community maps for Time 1 in this project makes a map-to-image change detection approach more suitable. Using this process, we will retain the plant community labels from the previous mapping effort, and use a logical matrix to ensure that appropriate labels are placed in the new classification.

4. **Georeferencing:Time 1 Map to Time 2 Current Imagery**
   We anticipate that the 2008-2010 data will not align perfectly with the 2015-2017 imagery. This task will register the Time 1 map (2008-2010 Plant Community Map) to the Time 2 imagery (2015-2017) by using a process commonly called rubber sheeting. The process is used to make small adjustments in the data to align features with more accurate information. As the name implies, rubber sheeting involves stretching the map by using some links that are aligned to more accurate locations (Ground Control Points or other photo-identifiable locations in the two time period data) and moving features to fit those links in a piece-wise transformation. We will apply this technique to assure that the Time 1 map aligns as best as possible to the Time 2 imagery. This process is not only needed for the change detection, but will be the foundation data that will be updated using heads-up digitizing. This process will greatly decrease the detection of false change and will also allow for better comparison of trends between the two time periods.

5. **Spectral Change Detection**
   We will then overlay the spatially adjusted 2008-2010 plant community map on the 2015-2017 imagery. By extracting the spectral signatures of

each wetland type, as defined by the previous classification, we can determine whether or not they have changed from their previous state using an approach called cross correlation analysis. This approach will look for pixels that have significantly different spectral characteristics to the mean of the population, or map class, i.e. Grass/Sedge Marsh (since most areas will not have changed). We will use the raw imagery and derivatives produced from the imagery, such as a Normalized Difference Vegetation Index (NDVI) and Saturation, both of which are sensitive to subtle change in vegetation and moisture content. This process will produce a preliminary change model which will be refined in a CART analysis (Classification and Regression Tree) process. The CART model will determine which image bands and derivatives are most predictive of change and which can be removed from the model.

6. **Elevation Change Detection**
   Some vegetation changes will be difficult to detect spectrally and will be more easily detected using a height differential. Using aero-triangulated points developed during the process of orthorectification, Sanborn will create a Digital Surface Model (DSM) from which we can derive the maximum height of vegetation, concurrent with the imagery. Using typical height for the community, and mean height derived from unchanged areas, a height differential map will be created showing areas of potential change. The result will be added to the spectral change result to create a comprehensive change map. This change map will be provided to the manual photointerpretation team for final delineation.

7. **Plant Community Delineation/Classification**
   Aerial photointerpretation of the 33 plant communities will be delineated and classified using heads-up digitizing procedures with the imagery collected for this project. The Change Mask output feature class will be merged with the rubber sheeted 2008-2010 plant community feature class to produce the project area feature class that will be edited. Only plant community polygons that are identified as changed by the photointerpreter will be edited or relabeled.

   Mapping procedures will follow the Spatial and Thematic Map Project Standards presented in a previous section. This process will be consistent with the procedure used for plant community mapping in 2008-2010 and will be conducted by the same experienced team of photointerpreters. For mapping regions in which stereo viewing may be required the photointerpreters will map using a workstation Summit Evolution and SSK.

8. **Thematic Accuracy Assessment**
   Random data points will be generated to conduct an accuracy assessment of the plant community mapping in each project area within each phase. The National Oceanographic and Atmospheric Administration's (NOAA's) Sampling Design Tool for ArcGIS will be used to develop a random sampling scheme stratified by map category (i.e., "Community" field). Random points will be located within community polygons with a total cumulative area greater than 50 acres. A minimum

of ten points from each plant community category will be sampled following Card (1982). Points shall not be located within at least 30 meters from the polygon boundary except for cases in which polygons are narrower than 30 meters. Points determined to be too close to the polygon boundary will be relocated closer to the center of the polygon or an alternative point will be selected. More than one point may occur in a large polygon as long as the points are separated by 30 meters or more. If points are closer than 30 meters apart, one will be removed or relocated. Field collection of the accuracy assessment points will follow the procedures outlined in the previous Signature Key and Ground-truthing section. Field points used for accuracy assessment will be collected within six and one-half months following aerial imagery acquisition to ensure that vegetation communities are as representative, to the extent possible, to those that were photographed. An accuracy assessment analysis, following Card (1982), and report will be provided for each of the three phases of the project. Each accuracy assessment report will contain an error matrix and associated statistics, and a list of the ground-truth points with their precise locations. Each matrix shall consist of at least ten points for each community type. A contingency table (Table 1) will be used to categorize the accuracy of the plant community maps. Categories A through E in Table 1 represent plant community classifications for the project (n =33). For each accuracy assessment point, the Map Category will be determined. The Map Category is the category that is the label in the plant community map. The True Category will be determined from the field accuracy data for the same location. If the community classification for the True Category is different than the Map Category it is tallied within the appropriate cell of the matrix. The Map Marginal Proportions are calculated from a union of the project areas for the accuracy assessment. A frequency distribution by community will summarize the area for each Map Category. The total area for each community class is divided by the total mapped area (i.e., recorded as a proportion).

Example Contingency Table for Accuracy Assessment						
True Category	Map Category					Row Totals
	A	B	C	D	E	
A						
B						
C						
D						
E						
Column Totals						
Map Marginal Proportions						

Maximum likelihood estimates for four probabilities of interest will be calculated; (1) marginal proportion, for true class, (2) probability correct, given true class, (3) probability correct given map class, and (4) overall probability correct. These calculations will directly follow Card (1982).

A variance of overall probability will also be calculated to show an approximate 95% confidence interval for overall probability. The techniques outlined by Card (1982) demonstrate the use of map-category relative size to improve estimates of probabilities important to map users. It should also be noted that Card (1982) responds to concerns of statistical design, such as optimal sample size selection by declaring the estimators valid regardless of sample size, "including samples sizes arrived at by guessing".

If ground-truth points have an overall accuracy of less than 85%, the Project Team will investigate the source of error and, in consultation with the District Project Manager, will determine a resolution that may require: 1) re-interpretation or re-classification of some areas; 2) acceptance of a lower user accuracy for some uncommon community types; or 3) coalescence of some community types.

Task Assumptions and Risks

1. Required personnel will be available.
2. Personnel will have access to field locations.

Risk Management

1. Sanborn will develop a schedule to ensure personnel are available and work contingency is in place.
2. Personnel will review locations and make adjustments as needed.

Contingency Plans

Work Contingency – In the event that any team member is unable to complete their project assignments, we will implement a back-up plan. Chris Harnden will be Vickie Larson's back-up. Qualified aerial photointerpreters or image processing specialists from Sanborn would support production: Bridget Marcotte and Matt Vernier. A local, qualified field technician would be hired.

Responsibilities

Sanborn will take on tasks described above.
The District will:

1. Review deliverables in a timely manner as described in the RFQ and List of Deliverables.

Task Target Completion Date

See Appendix B for list of Contract Deliverables and Time Frames.

Quality Assurance

Sanborn maintains rigorous Quality Assurance and Quality Control; see Quality Control Plan.

Deliverables

For each Project Phase, the Sanborn Project Team will deliver:

1. Signature/Training Key — ArcGIS files, Excel spreadsheet with GPS location and plant community notes, and ground photographs.
2. Test plot data including ArcGIS files, ground-truthing data, accuracy assessment, and ground photographs.

3. Ground-truthing ArcGIS files, Excel database and support materials (ground photographs, copies of the field notebooks).
4. Plant community ArcGIS file geodatabase (.gdb) with complete metadata in ESRI's ArcGIS v10.1 format and a map package (.mpk) for the plant community map.
5. Hard copy maps (in a format agreeable to the District's Project Manager) of each project area and phase.
6. A final Annual Report that includes the accuracy assessment and a graphical and textual summary analysis of changes in plant community distribution between the 2008–2010 and 2015–2017, as determined from a comparison of the maps.

The District will:

1. Provide imagery and 2008-2010 Plant Community data free of topological errors such as gaps, overlaps and missing attributes.
2. Provide a shapefile of Test Plot AOI.
3. Review deliverables and provide an acceptance letter.

5.2.4 Task 5: Final Report

Task Overview
A Final Contract Report, with a comprehensive Executive Summary, that collates information from all three Phases will be submitted no later than 30 days prior to contract termination. It will include the background of the project, the methodology utilized for all components of the project, and the summarization of changes in plant community distribution between the 2008 –2010 and 2015 – 2017 as determined from the maps.

Task Steps
TBD

Task Assumptions and Risks

1. Required personnel will be available.

Risk Management

1. Sanborn will develop a schedule to ensure personnel are available and work contingency is in place.

Contingency Plans
Work Contingency – In the event that any team member is unable to complete their project assignments, another team member will be assigned the task.

Responsibilities
Sanborn will take on tasks described above.
The District will:

1. Review deliverables in a timely manner as described in the RFQ and the List of Deliverables.

Task Target Completion Date
No later than 30 days prior to contract termination.

Deliverables
Sanborn will provide:

1. Draft Final Contract Report with executive summary
2. Final Contract Report with executive summary

6 WORKPLAN REVIEW AND UPDATES

Date of Update	By Whom	Description of Change
01.13.2015	Marcotte	Creation of Work Plan
01.13.2015	Sapeta	Review and copy Draft of Work Plan to the District
01.21.2015	Sapeta	Sent revised Work Plan to the District
01.23.2015	Ponzio	Sent review of revised Work Plan & comments on final billing schedule
01.26.2015	Ponzio	Provided approval of flight plan & ground control design; Provided comments on QC plan
01.26.2015	Marcotte	Reviewed and incorporated comments from the District
01.27.2015	Vernier	Reviewed and incorporated comments from the District
01.28.2015	Sapeta	Sent revised Work Plan to District
01.30.2015	Ponzio	Reviewed changes and sent final revisions on Work Plan, billing schedule, and QC plan
01.30.2015	Marcotte	Reviewed and incorporated comments from District. Changed task tables to text.

7 APPENDIX A: USJRB Project Areas and Required Feature Datasets

Map No.	Name of Project Area	File Geodatabase Name	Area (ac)
Phase 1			
1	Ft. Drum Marsh Conservation Area	fdmca	20,656
2	Blue Cypress Marsh Conservation Area (including Kenansville Lake)	bcmca	48,882
3	Fellsmere Water Management Area	fwma	11,179
4	Blue Cypress Water Management Area (including Banjo Groves, Corrigan, & Kromhout)	bcwma	11,776
Phase 2			
5	Three Forks Marsh Conservation Area	tfmca	13,716
6	Sixmile Restoration Area	sixmile	2,727
7	Sartori West	sartori	1,928

8	Broadmoor Marsh Restoration Area C-54 Retention Area (Goodwin Waterfowl Mgmt Area)	broadgood	6,788
9	Deseret Ranch	deseret	6,039
10	Sawgrass Lake Water Management Area C1 Retention Area	sawgrass	3,336
11	C1 Detention Area	c1deten	2,346
12	St. Johns Marsh Conservation Area	sjmca	23,247
13	Bull Creek Wildlife Management Area Jane Green Detention Area	bullcreek	27,887
Phase 3			
14	River Lakes Conservation Area	riverlakes	28,917
15	Moccasin Island Marsh Restoration Area	moccasin	14,023
16	Lake Poinsett / Canaveral Marshes Conservation Area	canaveral	39,543
17	Seminole Ranch Conservation Area	seminole	37,832
18	Buck Lake Conservation Area	bucklake	10,651

8 APPENDIX B: List of Contract Deliverables and Time Frames

Deliverable #	Item	Delivery Method	Format	Due Date	Year(s)
Aerial Imagery					
1.a.	Mission Plan	Emailed and archived on hard drive	.doc	24 hours before flight	2015 2016 2017
1.b.	Mission Log	Emailed and archived on hard drive	.doc	24 hours after flight	2015 2016 2017
1.c.	ABGPS/IMU Data & Processing Report	Emailed and archived on hard drive	.xlsx .pdf or .doc	Seven days after flight	2015 2016 2017
1.d.	Camera Calibration Report	Emailed and archived on hard drive	.pdf or .doc	Two weeks after flight; no later than March 31st	2015 2016 2017
1.e.1.	Center Coordinates of Frames	Emailed and archived on hard drive	.txt, .xls, or .xlsx	Two weeks after flight; no later than March 31st	2015 2016 2017

Deliverable #	Item	Delivery Method	Format	Due Date	Year(s)
1.e.2.	Flightline Map with Center Coordinates, Frame Polygons, and Ground Ctrl Pts	Duplicate hard copies and archived on hard drive	.shp	Two weeks after flight; no later than March 31st	2015 2016 2017
1.f.	Raw Digital Image Data	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	Uncompressed .tiff	Seven days after flight	2015 2016 2017
Orthophotos and Mosaics					
2.a.	Individual Digital Orthophotos	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.tif, .tfw, .SIDs or JP2	May 1st	2015 2016 2017
2.b.	Mosaic	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.tif, .tfw, .SIDs or JP2	May 1st	2015 2016 2017
2.c.	Checkpoint Survey & Report	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	ArcGIS File Geodatabase (.gdb) & .pdf	May 1st	2015 2016 2017
2.d.	Orthophoto Mosaic Metadata	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	.xml	May 1st	2015 2016 2017
Plant Community Maps					
3.a.	Signature/Training Key Photos and Database	Emailed and external hard drive	.xlsx and .jpg	Two months after flight; no later than May 15th	2015 2016 2017
3.b.	Test Plot with associated ground-truthing and Accuracy Assessment	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	ArcGIS shapefile (.shp) .xlsx .doc .jpg	June 15th	2015 2016 2017
3.c.	Ground-truthing ArcGIS Data and Support Materials	Electronic access via shared internet site (ftp, SharePoint, etc.) and External hard drive	. ArcGIS shapefile (.shp) .xlsx .doc .jpg	September 30th	2015 2016 2017
3.d.1.	Draft ArcGIS Data	External hard drive	ArcGIS File Geodatabase (.gdb)	September 30th	2015 2016 2017
3.d.2.	Final ArcGIS Data	External hard drive	ArcGIS File Geodatabase (.gdb)	November 1st	2015 2016 2017

Deliverable #	Item	Delivery Method	Format	Due Date	Year(s)
3.d.3.	Metadata	External hard drive	.xml populated in the .gdb file	November 1st	2015 2016 2017
3.d.4.	Map Package(s)	External hard drive	.mpk	November 1st	2015 2016 2017
3.e.	Map Plots	Duplicate hard copy plots and external hard drive	Custom size based on project area geography (1 each sub-project area; 1 entire project area)	November 1st	2015 2016 2017
3.f.1.	Draft Annual Report on Plant Community Analysis and Accuracy Assessment	Duplicate hard copies and external hard drive	.doc	December 1st	2015 2016 2017
3.f.2.	Final Annual Report on Plant Community Analysis and Accuracy Assessment	Duplicate hard copies and external hard drive	.doc	January 15th	2016 2017 2018
Final Documents					
4.a.	Draft Final Contract Report with Executive Summary	Duplicate hard copies and external hard drive	.doc	March 1st	2018
4.b.	Final Contract Report with Executive Summary	Duplicate hard copies and external hard drive	.doc	April 1st	2018

9 APPENDIX C: Plant Community Classification and Codes 2015-2017 USJRB Mapping Project

Type	Community		Description
SW	Shrub Wetland		In general, the shrub layer must be twice as tall as the herbaceous layer but less than half the height of the tree layer in order to be readily detectable using a stereoscope without resorting to stereoscopic height
	WS	Willow Swamp	Contains 70% or greater canopy coverage of willow (*Salix caroliniana*), that is at least twice as tall as the herbaceous layer.
	LU	Ludwigia	Contains 70% or greater canopy coverage by *Ludwigia peruviana* that is at least twice as tall as the herbaceous layer.
	MS	Mixed Shrub Swamp	Contains a mixture of shrub species (e.g. *Myrica cerifera*, *Salix caroliniana*, etc.) and/or trees that are at least twice as tall as the herbaceous layer. Tree species such as red maple (*Acer rubrm*) should be either less than twice as tall as the shrubs, or be less than 30%.
	TS	Transitional Shrub	Contains 70% or greater cover of species found in areas with shorter hydroperiods than in Mixed Shrub or Willow Swamps and is characterized by the presence of wax myrtle (*Myrica cerifera*), saltbush (*Baccharis* spp.), Brazilian pepper (*Schinus terebinthifolius*) or other FAC shrub species.
FW	Forested Wetland		
	CY	Cypress Swamp	Contains 70% or greater cover by *Taxodium* spp
	HS	Hardwood Swamp	Contains 70% or greater coverage of mixed wetland tree species such as red maple (*Acer rubrum*), black gum (*Nyssa* spp.), and ash (*Fraxinus* sp.), which are tolerant of fairly long hydroperiods and water depths.
	HH	Hydric Hammock	Contains 70% or greater coverage of mixed wetland tree species associated with depressions having moderately long hydroperiods, such as *Nyssa* spp., *Ulmus americana*, and wetland *Quercus* spp.
	CP	Cabbage Palm Hammock	Hammocks consisting of more than 70% Sabal palmetto, which may occur in hydric to mesic conditions.
	TI	Tree Island	Relatively small patches of trees within the marsh (tree islands), consisting of mixed wetland tree species which may include red maple (*Acer rubrum*), cabbage palm (*Sabal palmetto*), dahoon (*Ilex cassine*), and pond apple (*Annona glabra*). Islands may be surrounded by a narrow border of shrubs.
HU	Herbaceous Upland		
	DP	Dry Prairie	Contains greater than 70% coverage of mixed upland grasses, herbs, etc. with few to no trees.
	PA	Pasture	Similar to dry prairie but with evidence of maintenance by humans (fence lines, structures, water troughs, etc); on the ground diagnosed by the presence of introduced and cultivated grass species.
	RC	Row Crop / Orchard	Contains 70% or greater coverage by cultivated species with evidence of arrangement in rows, with or without drainage ditches. Includes orchards or groves and fallow fields.
	LR	Levees with roads	Levees with surface maintained for vehicles, either mowed, gravel or paved.
SU	Shrub Upland		An area with greater than 70% coverage of woody species that are at least twice the height of the herbaceous layer, but less than half the height of the tree layer and that is saturated or inundated for less than ten percent of the growing season.
	PP	Palmetto Prairie	Contains greater than 70% coverage by palmetto (*Serenoa repens*).
	SC	Scrub	Contains 70% or greater coverage by scrub oak species and other scrub species, with or without an overstory of sand pine (*Pinus clausa*).

Type	Community		Description
FU	Forested Upland		An area with greater than 70% coverage of tree species that are at least twice the height of the shrub layer, and that is saturated or inundated for less than ten percent of the growing season
	OH	Oak Hammock	Contains greater than 70% coverage by mesic oak (*Quercus* spp.) spe-
	PF	Pine Flatwoods	Contains greater than 50% coverage by *Pinus* spp.
	MH	Mixed Hard-wood	Contains mixed hardwood species, with pines and palms less than 70%.
	LV	Wooded Levees and Spoil Banks	Levees and spoil banks with surface not maintained or cleared. Often covered with *Sabal palmetto* and *Schinus terebinthifolius*.
OT	Other		
	BS	Bare Sand	Areas of >70% bare sand with no vegetation.

A

10 Appendix D: Flight and Control Layouts

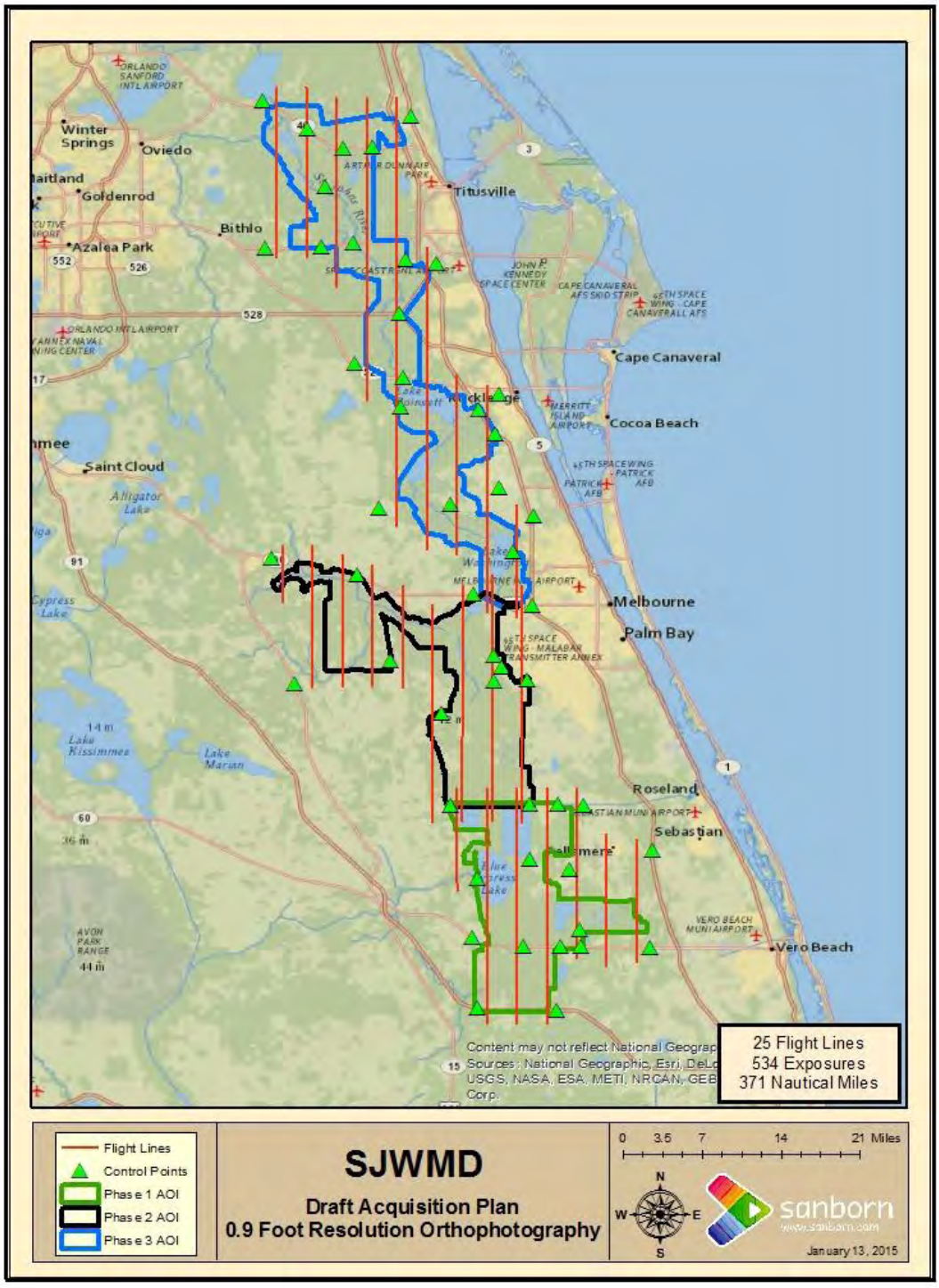

EXHIBIT 4 — SURVEYOR'S BILLING SCHEDULE

St. Johns River Water Management District Plant Classification Project Billing Schedule

Component number, if applicable	Deliverable #	Item	2015 Invoice Date	2015 Invoice Amount	2016 Invoice Date	2016 Invoice Amount	2017 Invoice Date	2017 Invoice Amount	2018 Invoice Date	2018 Invoice Amount
Aerial Imagery										
	1.a.	Mission Plan								
	1.b.	Mission Log								
	1.c.	ABGPS/IMU Data & Processing Report								
	1.d.	Camera Calibration Report								
	1.e.1	Center Coordinates of Frames								
	1.e.2	Flightline Map with Center Coordinates, Frame Polygons, and Ground Control Pts								
	1.f	Raw Digital Image Data								
			Upon delivery of imagery tasks listed above and no later than March 31, 2015	$ 12,500.00	Upon delivery of imagery tasks listed above and no later than March 31, 2016	$ 12,500.00	Upon delivery of imagery tasks listed above and no later than March 31, 2017	$ 12,500.00		
Orthoimagery and Mosaics										
	2.a.	Individual Digital Orthoimagery								
	2.b.	Mosaics (2)								
	2.c.	Checkpoint Survey & Report								
	2.d.	Orthoimagery Mosaic Metadata								
			Upon delivery of ortho and mosaic tasks listed above and no later than May 1, 2015	$ 12,500.00	Upon delivery of ortho and mosaic tasks listed above and no later than May 1, 2016	$ 12,500.00	Upon delivery of ortho and mosaic tasks listed above and no later than May 1, 2017	$ 12,500.00		
Plant Community Maps										
Part 1	3.a.	Signature/Training Key Photos and Database								
	3.b.	Test Plot with associated ground-truthing and Accuracy Assessment	Upon delivery of plant community maps Part 1 deliverable # 3.a and 3.b. tasks listed above and no later than June 15, 2015	$ 20,000.00	Upon delivery of plant community maps Part 1 deliverable # 3.a and 3.b. tasks listed above and no later than June 15, 2016	$ 20,000.00	Upon delivery of plant community maps Part 1 deliverable # 3.a and 3.b. tasks listed above and no later than June 15, 2016	$ 20,000.00		
	3.c.	Ground-truthing ArcGIS Data and Support Materials								
	3.d.1.	Draft ArcGIS Data								
			Upon delivery of plant community maps Part 1 tasks listed above and no later than September 30, 2015	$ 80,000.00	Upon delivery of plant community maps Part 1 tasks listed above and no later than September 30, 2016	$ 80,000.00	Upon delivery of plant community maps Part 1 tasks listed above and no later than September 30, 2017	$ 80,000.00		
Part 2	3.d.2.	Final ArcGIS Data								
	3.d.3.	Metadata								
	3.d.4.	Map Package(s)								
	3.e.	Map Plots								
			Upon delivery of plant community maps Part 2 tasks listed above and no later than November 1, 2015	$ 2,000.00	Upon delivery of plant community maps Part 2 tasks listed above and no later than November 1, 2016	$ 2,000.00	Upon delivery of plant community maps Part 2 tasks listed above and no later than November 1, 2017	$ 5,000.00		
Part 3	3.f.1.	Draft Annual Report on Plant Community Analysis and Accuracy Assessment								
	3.f.2.	Final Annual Report on Plant Community Analysis and Accuracy Assessment								
			Upon delivery of plant community maps Part 3 tasks listed above and no later than January 15, 2016	$ 3,000.00	Upon delivery of plant community maps Part 3 tasks listed above and no later than January 15, 2017	$ 3,000.00	Upon delivery of plant community maps Part 3 tasks listed above and no later than January 15, 2017	$ 10,000.00		
Final Contract Report										
	4.a.	Draft Final Contract Report with Executive Summary							Upon delivery and no later than 03/01/2018	$ 20,000.00
	4.b.	Final Contract Report with Executive Summary							Upon delivery and no later than 04/01/2018	$ 5,000.00
Total FY2015				$ 125,000.00						
Total FY2016				$ 5,000.00		$ 130,000.00	(includes year before amount)	$ 130,000.00	(includes year before amount)	
Total FY2017						$ 5,000.00		$ 15,000.00		$ 40,000.00
Grand Total		$ 425,000.00								

FIGURE 1 — PHASED IMAGERY CAPTURE AREA FOR USJRB
PLANT COMMUNITY MAPPING PROJECT

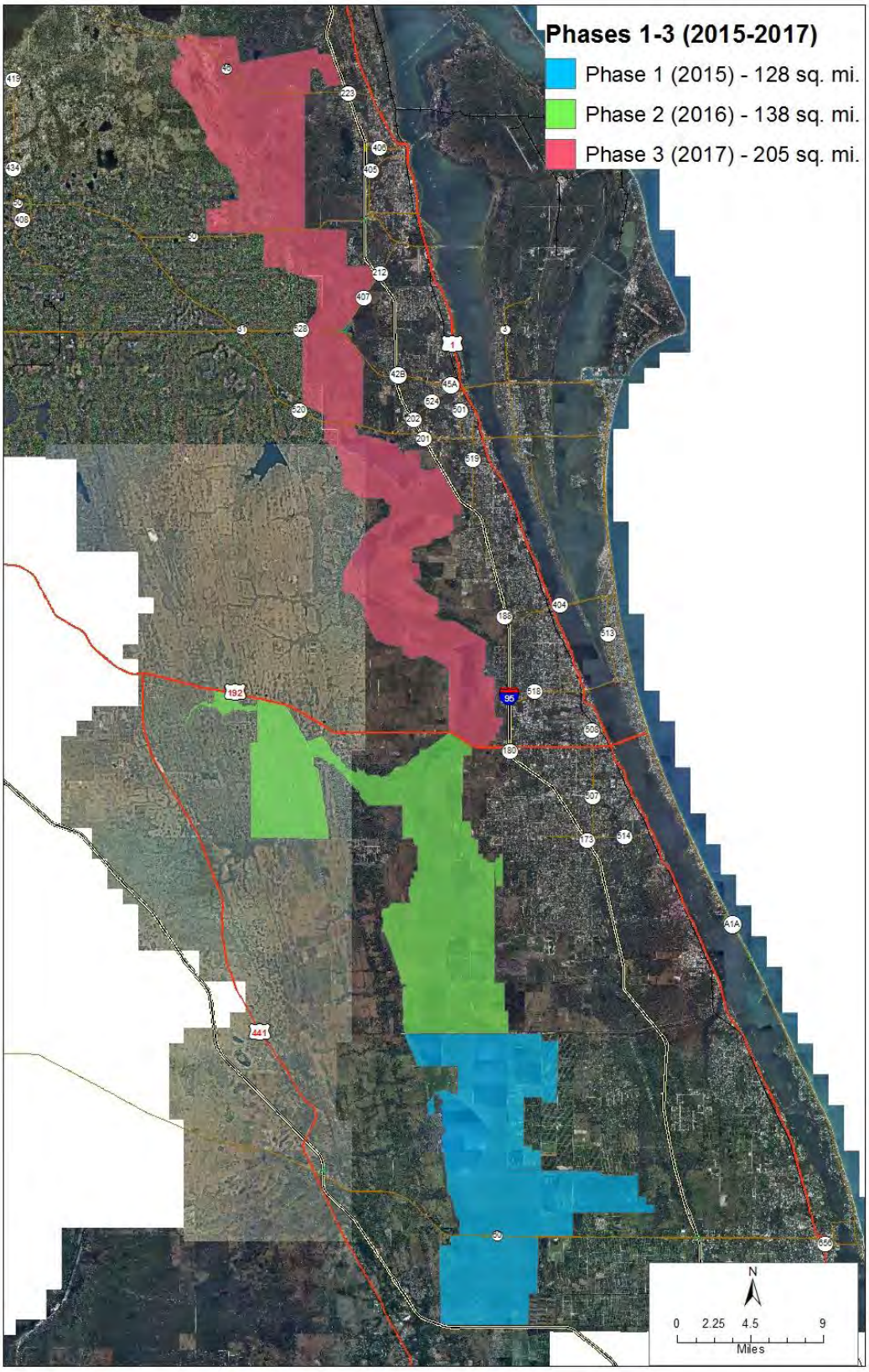

Figure 1. Phased Imagery Capture Area for USJRB Plant Community Mapping Project.

FIGURE 2 — USJRB PLANT COMMUNITY MAPPING AREA FOR 2015 – 2017