City of
Gainesville

RFP No. PWDA-230046-DH

Due: June 27, 2023
at 3 PM

Ecological Analysis and Tree Inventory

water & air RESEARCH, INC.

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water & air RESEARCH, INC.

Environmental Engineers, Scientists, & Planners

June 27, 2023

City of Gainesville
Procurement Division
200 East University Avenue
Gainesville, Florida 32601

RE: RFP #: PWDA-230046-DH – Ecological Analysis and Tree Inventory

Dear Evaluation and Selection Committee Members:

Water & Air Research, Inc. (Water & Air) is pleased to submit our proposal to provide Ecological Analysis and Tree Inventory services to the City of Gainesville (City). Water & Air understands the purpose of this project is to complete an ecological analysis of the City's urban forest, public and private; complete a detailed inventory of all City owned trees in the specified size class and locations, and to estimate change in the overall canopy coverage in Gainesville from 2016 to 2023. Water & Air also recognizes that the comprehensive inventory of specified City-owned trees will be conducted utilizing GIS technology, i-Tree ECO modeling, and TreePlotter software. Water & Air appreciates that the information gathered will support the City's 2020 Urban Forest Management Plan which seeks to keep Gainesville's urban forest abundant, diverse, and healthy, while providing ecosystem services and energy savings and to ensure that public safety in high use urban areas is not compromised by high-risk trees.

For more than 50 years, Water & Air has conducted high-quality ecological analysis, including plant community and tree inventories. Examples include numerous quantitative natural community surveys and assessments that included listed species, tree canopy and subcanopy and wetlands to multi-decade ecological monitoring of plant communities. Water & Air is teaming with ecologist Dr. Brian G. Ormiston who has been using aerial photography, GIS, and digital remote sensing imagery (satellite and airborne imaging systems) since the late 1980s and has project experience with a variety of satellite and airborne imagery. His experience includes tree canopy cover estimation, species mapping, and tree canopy change detection analysis in both natural and urban environments. Water & Air is also teaming with Ms. Kelly McPherson who is an ISA certified arborist. Ms. McPherson has over 26 years of forestry experience working for Workman Forestry, LLC, Alachua County Environmental Protection Department, Florida Natural Areas Inventory, and Florida Department of Environmental Protection Division of Recreation and Parks.

As an employee owned, certified-small business, Water & Air provides cost effective solutions, along with a high level of expertise with the appropriate level of credentials including PGs, PEs, and PhDs. Our highly motivated team and state of the art field equipment, combined with our personal level of service, make Water & Air the ***local and cost-effective solution*** to the City's ecological analysis and tree inventory needs.

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Continuing to serve the City of Gainesville is a priority for us. Water & Air is committed to providing qualified staff that will deliver superior service and technical results. Projects will be completed on schedule and within budget using the identified team members throughout the entirety of the project. Our program for quality assurance, in concert with our project management approach and commitment to the City, will enable Water & Air to successfully provide the services required under this RFP.

You have my personal commitment.

Sincerely,

Water & Air Research, Inc.

Barry L. Vance
President

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4.1B TECHNICAL PROPOSAL

INTRODUCTION
Water & Air Research, Inc. (Water & Air) is pleased to provide this proposal and approach to complete the ecological plot analysis of the City of Gainesville's (CITY) urban forest, public and private; complete a detailed inventory of all scope specified trees within CITY owned rights-of-ways and parks, and to estimate change in the overall tree canopy coverage in Gainesville from 2016 -2023 using remote sensing. Water & Air will team with ISA Certified Arborists Kelly McPherson (Workman Forestry, LLC) and Erick Smith (Kestrel Ecology, Inc.), and Brian G. Ormiston (BG Ormiston PhD Ecological Consultant) who will provide remote sensing image processing and analysis support for the urban forest resource assessment and mapping and GIS expertise for the CITY tree survey.

ECOLOGICAL ANALYSIS (Tasks 2 and 3)
One purpose of this task is to complete an ecological analysis of the CITY's urban forest utilizing the quantitative plot analysis methods from the 2016 study of 177 plots on public and private land. For continuity, at least 150 plots from the previous study will be revisited; however, new plots will be randomly selected if the 2016 study plots cannot be located or accessed. In addition to the tree plots, we will estimate change in the overall canopy coverage in Gainesville comparing 2016 and 2023 remote sensing imagery (e.g., Landsat imagery, NAIP aerial photography, additional Water & Air proposed imagery and methods). The results of this analysis will be compared to a similar analysis completed in 2016 for the CITY. The project area will be the boundary of the City of Gainesville that comprises approximately **161** square kilometers (62 mi^2).

This project will use ISA certified arborists, foresters, botanists, and plant ecologists coupled with GIS, i-Tree modeling and TreePlotter software. We will analyze the tree canopy coverage and utilize field sampling technologies to quantify the structure of the urban forest to evaluate the benefits of the urban forest within the CITY and for comparison to previous data and studies.

TREE INVENTORY (Task 4)
The CITY seeks a comprehensive tree inventory of specified trees, on CITY owned rights-of-ways (ROWs), and in urbanized sections of city parks and approximately 400 miles of CITY owned and/or maintained road rights-of-ways. TreePlotter software and field forms will be provided by the CITY will be used and shapefiles depicting CITY ROWs will be generated to aid in survey logistics. Trees owned by the CITY **in forested and conservation lands are not to be included in the Inventory**.

TIMEFRAME
This Inventory is projected to be carried out over a 3-year timeframe, due to the estimated number of trees subject to the Inventory. This estimated number is **38,500** trees (25,000 total street trees, and 13,500 total urban park trees).

Task	Start Date	Completion Date
Project Management	Contract award	Quarterly Meetings w/ CITY
Ecological Analysis of the City's Urban Forest	Contract award	18 months after award
Tree Inventory	Contract award	24 months after award
Estimate Canopy Coverage Change 2016 - 2023	Contract award	9 months after award
Plot Analysis	Contract award	18 months after award

INFORMATION DESIRED (Task 5)
The information gained through this inventory of urban trees will help the CITY accomplish the following goals:

1. Estimate the citywide percent of the tree canopy using 2022-23 (the most recent aerial imagery) and create maps showing tree canopy change between 2016 and 2023.
2. Assess the urban forest overall health, diversity, and size distribution by species and land- use.
3. Determine estimated tree species diversity and invasive tree species composition based on the results of field sampling efforts.
4. Estimate the economic benefits provided by the current canopy as calculated by the Urban Forest Effects (UFORE) model.
5. Compare the current economic benefits to the previously reported benefits (2016 Ecological Analysis).
6. Build public support for the city urban forestry programs by making citizens aware of the results of this inventory.

7. Promote better tree care of ROW and City Park trees, since the CITY will have data including Level 1, ISA Standards on each tree inventoried under the scope guidelines.
8. Assist in determining tree planting locations with respect to power lines, vehicular line-of-site, etc., that is potentially available for new tree plantings.

SCOPE OF SERVICES
The project will be conducted according to the following scope of services:

Task 1.0 Project Planning
The project will involve significant collaboration between the Water & Air team and the CITY which will make up the P**roject Team**. One of the primary goals of this first phase of the project will be to conduct background research regarding precise inventory methods and to collect materials (e.g., GIS data and imagery) needed to complete the project. The project team will meet to review project details including specific research questions the City may have, review field sampling techniques, discuss access issues to field locations, imagery, GIS data requirements, and TreePlotter data requirements. Expanding tree plotter fields to include data not enumerated in the scope but easily available may allow the CITY additional information needed to ensure a healthy and sage tree canopy. The results of this project planning task will guide the overall project and data collection. However, the collaborative and dynamic nature of the project will continue as part of each individual task mentioned below; the project team may refine or add any desired analyses or techniques as required or based on the available budget.

Task 2.0 Analysis of Tree Canopy using Remote Sensing Techniques
The purpose of this task will be to utilize remote sensing techniques and imagery. Water & Air proposes the addition of readily available higher resolution imagery to analyze the citywide urban forest as accurately as possible. Through the acquisition and analysis of imagery, Water and Air will characterize the urban forest canopy coverage in 2023 with a change comparison to previous years (1995, 2005 and 2016) and studies. Since Landsat imagery is known to underestimate tree canopy cover with its 30m pixel size, Water and Air will also use very-high resolution aerial imagery at 10 m pixel size to develop accurate estimates of citywide tree canopy cover. A dot-based sampling approach will be used using NAIP aerial photographic imagery from 2016, and the soon to be released 2023 imagery, to quantify citywide tree canopy cover and change with a greater than 90 percent confidence intervals.

The combination of the moderate- resolution mapping and the accurate citywide estimate will show the pattern of tree cover distribution across the city and canopy change loss/gain at the neighborhood level and provide very accurate estimates of citywide change. Image analysis results will be converted to GIS data format and provided to the CITY. Future work efforts, with additional funding, could utilize the very-high resolution aerial imagery to develop detailed land cover maps for exploration of tree cover and change at the resolution of the property parcel. All analysis results will be included within the final report (Task 5).

Proposed Imagery: Landsat 30 m multispectral, Sentinel-2A&B 10 m multispectral, and NAIP 1 m 4-band (visible blue, green, red and NIR bands) imagery.

Proposed Remote Sensing and GIS Software: European Space Agency's SNAP with SNAP 2 toolbox, QGIS geographic information software (both freely available), and ENVI remote sensing and ArcGIS commercial GIS software packages.

A more detailed discussion is in the **TECHNICAL APPROACH: Remote Sensing of Tree Cover and Change Detection Analysis.**

Task 3.0 Field Work and i-Tree ECO Analysis
Water & Air will be the lead partner in the field sampling of the urban forest. During the growing season of 2023, Water & Air will establish a minimum of **150** permanent field plots (and not to exceed 177 plots) in the CITY by prioritizing the location of plots used in the 2016 study. If 150 plots cannot be located or permission granted, a stratified random sampling approach will be used to locate the additional plots using land use categories (derived from existing land use/land cover GIS data sets) agreed upon by the project team.

Plot data will be collected using the methodology prescribed for the **UFORE** models (henceforth called **i-Tree ECO**)

developed by the USDA Forest Service and modified by the project team for use in Florida. This methodology will include the establishment of **1/10th** acre circular permanent plots and all measurements will occur within the plot area. As these plots may fall in both public and privately owned lands, the CITY will provide access to publicly owned lands and **help contact** landowners to gain permission to access private property. The following is an outline of the data to be collected on each permanent plot:

1. Individual plot data collected, at a minimum, will include:
    A. Plot ID number.
    B. Latitude and longitude.
    C. Land use/land cover from CITY provided GIS data.
    D. Actual land use/cover.
    E. Percent Tree cover/plot.
    F. Individual tree data.
        1. Tree number.
        2. Species.
        3. DBH (>1 inch).
        4. Total height.
        5. Height to crown base.
        6. Crown width.
        7. Crown condition class.
        8. Percent canopy missing/percent dieback.
        9. Direction/distance to residential building (need for energy conservation only).
    G. Percent shrub cover.
    H. Percent ground cover.

2. Plot locations will be recorded using Global Positing System (GPS) receivers and range finders.

3. Quality assurance will be conducted to ensure accurate field sampling results. Quality assurance procedures used in data collection will be documented and sent along with the field data. Checks will be made during the training of new employees, and on randomly selected audited plots after they are completed by senior ecologists and botanists. The number of errors detected will determine the frequency of inspections.

4. In 2006, approximately 95 sample plots were established by Drs. Escobedo and Zipperer. In 2011 these plots were resampled by this team, but they were only able to relocate and/or access approximately 65 of those original plots. The 2016 Ecological Analysis provided data on 177 plots. Ideally these plots would be revisited during the 2022-2023 sampling effort to provide long term data about individual tree growth and vegetation change over time. Where feasible (assuming access permission is given and plot center can be identified), Water & Air will attempt to re-measure those plots and account for them in the stratification of the field plots.

Water & Air will process the collected field data using **i-Tree ECO** modeling software. The output of the models will provide information related to the physical structure and health of the urban forest as well as some of the economic benefits trees provide in the urban environment. An analysis of the model output will be included in the final report (Task 5).

Task 4.0 Tree Inventory

A comprehensive inventory of all scope specified CITY-owned trees on street ROW's and urbanized areas of CITY parks, as described above (tree inventory). The timeframe is expected to cover three years but can be accomplished sooner if finalized prior to three years.

Distinguishing characteristics to identify an urbanized section of a city park would be the presence of buildings, parking lots, domestic grass turf, or manmade ground cover of some type. Trees should be inventoried if they are within **100-feet** of these characteristics and on CITY property. Trees on private property within the 100-foot area are not included.

The inventory shall consist of data taken for each tree **8 inches** diameter and larger. Data shall be recorded on "**TreePlotter**" software, and include the following:

1. Picture.
2. Latitude-Longitude.
3. Species.
4. Diameter at Breast Height.
5. Estimated Height (Range of Values).
6. Estimated Crown Spread (Range of Values).
7. Condition (Excellent, Good, Fair, Poor; including specific Condition of Concern).
8. Risk Rating (Level 1 Assessment).
9. Available Planting Locations should also be geo-located and tallied.
10. Additional information may be added to the TreePlotter input data sheet by the CITY to enhance data collection such as defects and environmental conditions.

Major Defects and Tree Conditions

- Root collar/Root plate - loss of support.
- Decay (root, trunk, structural limbs).
- Cracks (trunk, structural limbs, branches >2").
- Codominant stems (and/or Included bark).
- Dead parts.
- Broken and/or hanging branches.

Site and Environmental Conditions to Consider

- Construction activity.
- Flooding.
- Infrastructure conflicts.
- Storm events.

Task 5.0 Final Report

The project team will produce a final report that outlines the data collection methodology and results from data analysis. The proposed analysis results will focus on the percentage canopy cover by land use/cover, general forest health, urban forest structure, and a summary of urban forest benefits provided to the citizens of Gainesville at the time of inventory. Street tree and Park tree inventory will be summarized by totals and individual categories, plus provided within the **TreePlotter** software. Methodology and results from the remote sensing task will be included in the final report, as will electronic copies of GIS data sets developed and derived during the study. The final report will be provided in PDF format and GIS data layers created during the project will be provided, with appropriate **metadata,** in an ArcGIS compatible format for distribution to the CITY. Finally, the project team will present results to the CITY Commission, CITY administrator's office, Public Works Department, and **two** additional presentations to be determined by the CITY. Analysis to be provided in the final report at minimum are as follows:

- Citywide tree canopy temporal change from 1995 - 2023.
- Tree cover maps and summarized data by neighborhood and land use/cover.
- Tree species diversity summarized by land use/cover.
- Density of trees by land use/cover category.
- Tree species/size distribution.
- Tree, shrub and ground cover estimates by land use/cover category.
- Leaf area by tree species and land use/cover category.
- Relative health of trees by land use/cover category.
- Residential energy savings and CO_2 emissions avoided.
- Estimated air pollution removal by trees including carbon monoxide (CO), nitrogen dioxide (NO_2), ground level ozone (O_3), particulate matter (PMlO), and sulfur dioxide (SO_2).
- Carbon dioxide (CO_2) storage and annual sequestration amounts by tree species, size class and land use/cover category.
- Estimated compensatory (i.e., replacement) value of the trees in Gainesville.

CITY ASSISTANCE

- The CITY **will provide** digital GIS data (boundaries, zoning, parcels and streets, ROW) for use in creating base maps for remote sensing and field data analysis.
- The City **will provide** access to the City's version of TreePlotter software for inventory data collection.
- The CITY **will provide** Water and Air right of entry to CITY property for a mutually agreeable time period.
- The CITY **will notify** residents and concerned CITY employees, such as park employees and public safety officials, as to the nature of this project and the presence of the project team in the neighborhoods.
- Once sample plot locations have been generated using GIS, the CITY **will contact** landowners and attempt to gain permission for the data collection teams to access private lands. Water and Air data collection teams can follow up and make appointments with landowners as necessary for property access and plot measurement.

CITY Project Manager
Dave Conser, City Arborist
City of Gainesville, Public Works, Operations – Urban Forestry Division 405 NW 39th Ave, Gainesville, Florida, 32609
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Technical and Management Approach
To manage the technical goals of this project, we will employ a responsive client oriented organizational approach developed by Water & Air over 50 years of conducting ecological studies and assessments. The project team will provide the required professional services using a three-tiered approach of: proactive project management, stringent quality control measures, and abundant experienced technical resources. Our project team will serve as an extension of the CITY'S staff.

The Project Team Director, **Mr. Barry Vance**, will be responsible for overall project operations, including coordination with CITY staff, coordination of the professional and technical staff, and sub-respondents and consultants.

Peter NeSmith will be the Project Manager responsible for the day-to-day oversight of the project with assistance from **Jim Surdick, Eric Nelson,** and **Sky Notestein** on the various tasks. The Project Manager will work with the Project Director to plan and achieve project milestones and to initiate kick-off meetings, involving appropriate personnel (Water & Air Project Director and Manager at a minimum), and CITY representatives. Experience shows that well-executed project planning results in an improved product with fewer surprises and delays.

Essential to minimizing risk to the CITY, our Project Director, **Barry Vance**, Quality Assurance Officer (QAO, **Sky Notestein**), and Project Manager, **Peter NeSmith**, consider contingency planning in the development of a work plan. We develop teams with sufficient depth to sustain the loss of key personnel, should they become suddenly unavailable. Likewise, our Standard Operating Procedures (SOPs) for field operations includes the need for redundancy for critical pieces of equipment. Our project-specific Safety Plans for field operations provide guidance and directives to the Project Managers and Field Supervisors in the safe conduct of field activities. Careful consideration is given to specific conditions expected while performing the work. If specific hazards are identified, consultation with the CITY Project Manager, other CITY personnel, and the Water & Air Project Manager will occur to develop specific procedures to minimize hazards and incorporate them into a project specific Safety Plan.

Management of sub-respondents will be the responsibility of the Water & Air Project Manager with oversight by the Project Director. Staffing teams with appropriate sub-respondents and developing sub-respondent's scope of work, staffing assignments, and subcontract agreements will occur during project development. Water & Air understands that the cornerstones of successful project management (responsiveness) are clear and consistent lines of communication and the ability to meet or exceed project timelines. Our Project Managers will implement user-friendly project planning timelines to standardize project planning and scheduling. These timelines identify key tasks and serve to inform the City Project Manager on project task and subtask completion.

Quality Assurance/Quality Control (QA/QC)
The QAO and Water & Air understands that QA/QC are integral aspects of any assignment and will be applied to all project tasks, with components including proper training of field staff using ISA trained arborists, QA/QC of field collected data in the early stages of each task by an appropriate field ecologist/botanist, ISA arborist, or GIS specialist. Defensible, accurate QA/QC'd field collected data is vital to an efficiently organized study. Addition QAO duties include assessments of historical data used for interpretation, documentation of communications and requests for information, integrating text from multiple authors, attributing data to appropriate sources, and disclosing known data gaps. Our Project Director, Project Managers, and staff have guidance and support from seasoned QA personnel to ensure work products that exemplify our commitment to quality.

TECHNICAL APPROACH: Remote Sensing of Tree Cover and Change Detection Analysis
City of Gainesville RFP Ecological Analysis and Tree Inventory
Purpose: Assess City-wide Tree Canopy Cover and Change from 1995-present
Task Manager: Brian G. Ormiston, Ph.D. (Ecology).
Proposed Imagery: Landsat 30 m multispectral, Sentinel-2A&B 10 m multispectral, and NAIP 1 m 4-band (visible blue, green, red and NIR bands) imagery.
Proposed Remote Sensing and GIS Software: European Space Agency's SNAP with SNAP 2 toolbox, QGIS geographic information software (both freely available), and ENVI remote sensing and ArcGIS commercial GIS software packages.

Remote Sensing Technical Approach Description:
Landsat 8 (launched in 2013) and 9 (launched in 2021) have identical multispectral sensors (Table 1), are currently in operation and will be used for comparative purposes with the previous Landsat imagery from May 1996 which is the baseline year. *Sentinel 2 (there are two satellites A and B) has a much better spatial resolution (10 m for the bands of interest, Table 2) compared with Landsat (30 m pixels) and will result in less underestimation of current tree canopy cover.* Therefore, in addition to using Landsat imagery for legacy reasons, classification of current 2022 or 2023 Sentinel imagery will also be performed. Sentinel 2A was launched in 2015 and Sentinel 2B launched in 2017. The revisit (same scene area) frequency for either satellite is 9 days but together collect identical band sensor data approximately every five days. Revisit times are as short as 2-3 days if different angles of imagery are acceptable. In contrast the Landsat program collects a scene area less often (with Landsat 8 and 9 combined the revisit time is 8 days). *As a result, Sentinel-2 collects more data in each period and is more likely to collect cloud free imagery. The higher spatial resolution (10 vs. 30 m) provides an additional advantage.*

The NAIP 1m multispectral aerial imagery will be obtained from USDA NAIP program. This imagery is also freely available by downloading from the USDA. New imagery is expected to be released this year (2023). In addition to the dot analysis visual photointerpretation approach used in the 2016 study to estimate canopy cover visually using this higher resolution imagery, a digital classification approach will be performed using the NAIP multispectral image bands for the study by generating normalized difference vegetation index (NDVI) images using decision rule classifiers to map tree cover, shrub/grass, and unvegetated surfaces at a 1 m spatial resolution. *This will extend the 2016 dot cover manual photointerpretation to a more modern complete area approach facilitated by NDVI for the entire study area.* The random dot analysis visual analysis will be used to both provide an independent estimate of canopy cover and to estimate the accuracy of the NDVI-based approach.

Table 1. Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS)

Bands	Wavelength (micrometers)	Resolution (meters)
Band 1 - Ultra Blue (coastal/aerosol)	0.435 – 0.451	30
Band 2 - Blue	0.452 – 0.512	30
Band 3 - Green	0.533 – 0.590	30
Band 4 – Red	0.636 – 0.673	30
Band 5 – NIR	0.851 – 0.879	30
Band 6 – SWIR 1	1.566 – 1.651	30
Band 7 – SWIR 2	2.107 – 2.294	30

Band 8 – Panchromatic	0.503 – 0.676	15
Band 9 – Cirrus	1.363 – 1.384	30
Band 10 – Thermal 1	10.60 – 11.19	100* (30)
Band 11 – Thermal 2	11.50 – 12.51	100* (30)

Table 2. Spectral bands for the operational Sentinel-2 sensors (10 m resolution bands in bold font)

Sentinel-2 bands	Sentinel-2A		Sentinel-2B		
	Central wavelength (nm)	Bandwidth (nm)	Central wavelength (nm)	Bandwidth (nm)	Spatial resolution (m)
Band 1 – Coastal aerosol	442.7	21	442.2	21	60
Band 2 – Blue	492.4	66	492.1	66	10
Band 3 – Green	559.8	36	559.0	36	10
Band 4 – Red	664.6	31	664.9	31	10
Band 5 – Vegetation red edge	704.1	15	703.8	16	20
Band 6 – Vegetation red edge	740.5	15	739.1	15	20
Band 7 – Vegetation red edge	782.8	20	779.7	20	20
Band 8 – NIR	832.8	106	832.9	106	10
Band 8A – Narrow NIR	864.7	21	864.0	22	20
Band 9 – Water vapour	945.1	20	943.2	21	60
Band 10 – SWIR – Cirrus	1373.5	31	1376.9	30	60
Band 11 – SWIR	1613.7	91	1610.4	94	20
Band 12 – SWIR	2202.4	175	2185.7	185	20

Remote Sensing Sub-tasks:

Imagery Collection. We will review available imagery from the various online servers of the satellite (Landsat) and digital aerials (USDA NAIP) to obtain appropriate leaf-on growing season imagery consisting of cloud-free scenes for 2016 and the current 2023 imagery. Sentinel 2 data prior to 2015 does not exist, so mapping with Sentinel for 1996 is not possible nor is it necessary. Although the response to questions #10 and #11 is confusing, it is stated that the comparison of years should be between the 2016 imagery and current conditions (2023), although the response also mentions the 1996 and 2006 years for Landsat noting that this data may not be available. Landsat and Sentinel data will be obtained for 2016 and 2023 and used as described previously. The NAIP digital 4-band 1 m aerial photography will also be obtained and used. NAIP data to be released in 2023 will likely be from November 2022 and acquired by a Leica ADS-40 digital multispectral camera with blue, green, red and near-infrared bands. The Florida data for 2015 was also acquired in November and released in 2016. All data will be evaluated as to quality using both the supplied metadata from the agencies and by inspection in the remote sensing software environment.

Radiometric and Spatial Calibration (radiance and reflectance for satellite imagery). Satellite data is available in a radiometrically corrected format with atmospheric effects corrected and expressed as surface or top of atmosphere reflectance of incoming solar irradiance (0 to 100 percent) as opposed to radiance (energy) units. When comparisons are being made of the same area over different time periods, it is generally important to use reflectance data. ESA SNAP and ENVI remote sensing image processing and analysis software will be used to check quality and perform additional tasks. The quality of the data will be reviewed and if necessary, further radiometric corrections can be performed independently using image metadata and SNAP or ENVI. In addition, further calibration between image scenes between years may be required to minimize any residual differences due to time of acquisition and different illumination conditions. This image to image calibration was discussed in the 2016 report in Appendix C. We will use linear empirical line calibration (ELC) methods to calibrate the current imagery to the baseline year imagery (e.g., 2023 to 2016 for Landsat and Sentinel-2) where appropriate. In the case of NAIP 1 m imagery, the 2023 imagery will be calibrated to the NAIP baseline year of 2015 (which was the baseline year of NAIP imagery used in the 2016 study analysis).

Spatial Calibration will also be performed. Change detection between images of the same area requires highly accurate pixel to pixel correspondence among years to avoid errors in change classification due to spatial errors. Otherwise, false change indications due to spatial differences between the two images being compared will result. It is also important that all imagery raster layers, and GIS shapefile (point and vector) layers are in the same coordinate and map projection for ease of use. We will perform projection transformations as needed. To assess accuracy, Ground Control Points (GCPs) will be established using well defined features visible in the imagery, and the software georegistration tools to estimate the geospatial accuracy (root mean square error, RMSE) and if necessary, apply appropriate georegistration transform corrections to achieve pixel to pixel correspondence between years. Generally, with the satellite scale imagery that is proposed (10 to 30 m) the geoaccuracy should meet requirements for change analysis without additional processing. The goal is to have the average error substantially less, usually less than half, of the imagery spatial resolution (e.g., for Landsat less than one-half of 30 m or < 15 m). For NAIP 1 m imagery the goal is < 0.5 m. Our quality assurance checks will be conducted using both GCP error estimation and visual inspection using image overlay techniques and if necessary, image-to-image georegistration and reflectance matching can be performed. All accuracy results and steps taken will be documented and provided as part of the remote sensing task.

Masking. Subsetting and masking of overall scenes will be done to restrict the computer processing and, analysis of tree canopy pixels to the boundary polygon or polygons of the areas of interest defined by the CITY (as opposed to the entire satellite imagery scene area of data downloaded for the region surrounding the CITY). SNAP or GIS software will be used to create and apply the masks. When computing indices such as NDVI, and performing change analyses, the masked areas can be excluded from the software processing, which reduces processing time and is more efficient. Excluded areas within the image will be coded as no data values in the output layers (e.g., NDVI or tree canopy classifications raster layers), and in the resulting areas classified as canopy or non-canopy.

Preparation of additional remote sensing index rasters. Image-derived indices needed for digital mapping and change detection analysis include NDVI (the Normalized Difference Vegetation Index) and BCI (Biophysical Composition Index). Both indices are represented as floating point (double precision) values. NDVI values are correlated with the amount of actively photosynthetic biomass present in a pixel. NDVI ranges from -1 to +1, with trees generally having values > 0.7. Shrubs typically range from 0.25 to 0.6, and grass cover ranges from 0.1 to 0.2. Bare soil, impervious surfaces, and water are less than or equal to 0. *The BCI index is a quantitative spectral indicator designed for characterizing major urban land cover compositions following Ridd's conceptual vegetation– impervious surface–soil (V–I–S) triangle model. The index is explained in the 2016 report that was prepared for the City of Gainesville and for continuity of methods with the 2016 analysis will be used in our approach.* Both indices are readily computed using SNAP or ENVI. Once the previous image processing steps have been completed, these additional raster bands will be computed, saved to the project workspace, and utilized in the study assessment tasks. *Additional indices are available with the satellite imagery that can be computed by the software including leaf area index (LAI) and vegetation water content (which can be useful in identifying areas of canopy stress). We can easily provide these products for the CITY if desired and can discuss this with the City when appropriate.*

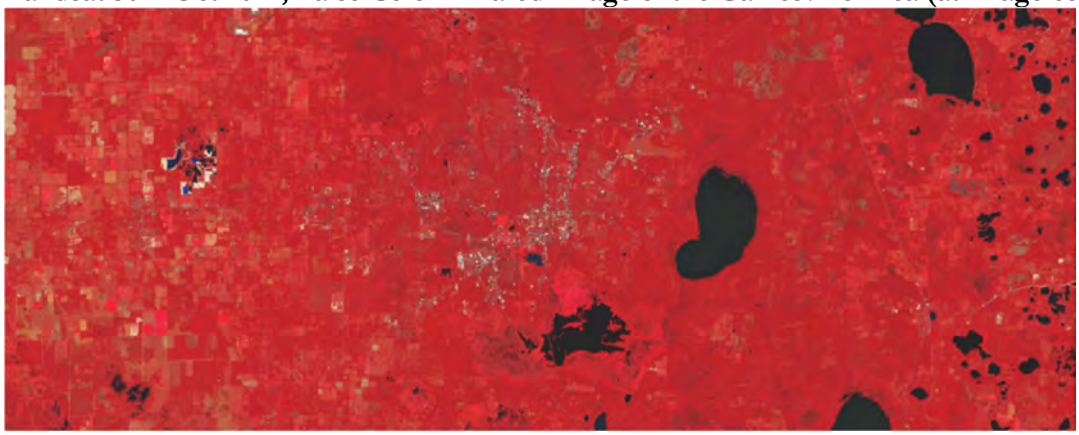
Classification-Tree canopy cover mapping. Tree canopy presence or absence will be determined using NDVI and BCI indices with a Decision Tree Rule Classification procedure. We have extensive experience in remote sensing classification using decision rule classifiers for forest canopy mapping and change detection on projects that have been conducted in spring and fall each year for over 20 years using airborne digital multi-spectral camera imagery with resolution of 0.5 m. The basic concept is that pixels are classified as canopy or other classes (e.g., grass, unvegetated or open water) using threshold values for NDVI and BCI. The changes (canopy loss, gain, unchanged) are then determined and output in the change detection layer for the desired periods of comparison. We have used this approach in long term environmental monitoring projects evaluated for as long as 20 years. Accuracy and confidence will be assessed using standard remote sensing methods, and the map image class raster images, and vector polygons (created by exporting the raster images to vector format such as shapefile polygons) of tree canopy and change provided to the field team and CITY. Errors in classification compared to ground-truth results largely result from limits of the spatial resolution of the imagery used. For high resolution imagery like 1 m NAIP, canopy cover is highly accurate. As noted in the 2016 report coarser resolution imagery like Landsat will underestimate canopy cover. This is because the actual reflectance from within such large pixels can be a mixture of light reflected from trees as well as non-tree surfaces. The error is greater in urban forest areas where the canopy is fragmented or intermittent. Classification error matrices will be generated to assess producer and user accuracy levels and overall classification accuracy.

Products. All source imagery and metadata, image mosaics for study areas, raster classification images and vector representations of tree canopy cover, and a report appendix describing all steps taken to complete the work will be provided as project deliverables. Graphics to illustrate tree cover by year and difference areas between years (e.g., canopy loss and gain areas) will be prepared for inclusion in the main study report. The remote sensing task team will also prepare imagery for use by the field survey team to use as a "moving map" background image for use on GPS enabled tablet or handheld field units.

Performance Period. It is anticipated that all remote sensing tasks will be completed rapidly during the first year of the project. If the CITY desires analysis of future years this could be accomplished with minimal additional cost given that the future imagery is freely available, and the workflow is largely automated and performed efficiently within current computer and software environments.

Sample Imagery

Landsat 30m Oct 2022, False Color Infrared Image of the Gainesville Area (at image center).



Sentinel-2A 10m May 3, 2023, False Color Infrared Image of the Gainesville Area (at image center).

Sentinel-2A 10m May 3, 2023, NDVI raster image (grayscale, areas of greater plant biomass appear brighter, areas of less or no vegetation, or open water, are darker appearing dark gray to black). The area shown is a zoomed in subarea of the previous FCIR Sentinel image, with the City of Gainesville at lower center, and the Regional Airport and its runways (dark lines) visible at upper right.

Illustration of Sentinel-2B 10m imagery FCIR

NAIP 1m true color imagery

Illustration of Landsat 9 30m

4.1C PRICE PROPOSAL

PART 3 – PRICE PROPOSAL

3.1 PROJECT COSTS AND DELIVERABLES

Total cost is based on completion of all project tasks and deliverables stated above (TASKS 1- 5).

Budget will cover: labor, field equipment (including computer tablets for data collection), computer for data input and analysis, vehicle mileage, printing and postage, purchase of imagery.

1. TOTAL COST FOR ECOLOGICAL ANALYSIS-: $ 206,771.44

2. COST FOR TASK 4 TREE INVENTORY - $ 16.51 per tree cost
(Total cost will be based on an estimated 38,500 number of trees-25,000 total street trees and 13,500 total urban park trees)

Award will be based on total cost of 1 and 2.

NOTE: If travel is involved in the execution of an awarded contract for this solicitation, should any air travel be required the City's travel policy allows for Coach air travel only. All other travel will be billed in accordance with the Federal General Services Administration rates which can be found at: https://www.gsa.gov/travel/plan-book/per-diem-rates. In addition, long distance phone calls, printing, and other administrative costs may be billed at cost only -no mark-up. Evidence of these expenditures will be submitted when invoicing the City. Travel and administrative costs should be identified in the Price Proposal.

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4.1D QUALIFICATIONS

BID COVER

City of Gainesville

Procurement Division
(352) 334-5021(main)

Issue Date: May 26, 2023

REQUEST FOR PROPOSAL: #PWDA-230046-DH
Ecological Analysis and Tree Inventory

PRE-PROPOSAL MEETING: ☒ **Non-Mandatory** ☐ **Mandatory** ☐ **N/A** ☐ **Includes Site Visit**
DATE: June 8, 2023 TIME: 9:00 am
LOCATION: Smokey Bear Park (2300 NE 15th St Gainesville, FL 32609)

QUESTION SUBMITTAL DUE DATE: June 15, 2023 @ 5:00 pm

All meetings and submittal deadlines are Eastern Time (ET).

DUE DATE FOR UPLOADING PROPOSAL: June 22, 2023 @ 3:00pm

SUMMARY OF SCOPE OF WORK: The purpose of this project will be to complete an ecological analysis of the City of Gainesville's (CITY) urban forest, public and private; complete a detailed tree inventory of all City of Gainesville owned trees, and to estimate change in the overall canopy coverage in Gainesville from 1995 -2023.

For questions relating to this solicitation, contact: Diane Holder, holderds@gainesvillefl.gov

Bidder is not in arrears to City upon any debt, fee, tax or contract: ■ Bidder is NOT in arrears ☐ Bidder IS in arrears
Bidder is not a defaulter, as surety or otherwise, upon any obligation to City: ■ Bidder is NOT in default ☐ Bidder IS in default

Bidders who receive this bid from sources other than City of Gainesville Procurement Division or DemandStar.com MUST contact the Procurement Division prior to the due date to ensure any addenda are received in order to submit a responsible and responsive offer. Uploading an incomplete document may deem the offer non-responsive, causing rejection.

ADDENDA ACKNOWLEDGMENT: Prior to submitting my offer, I have verified that all addenda issued to date are considered as part of my offer: Addenda received (list all) # Addendum # 1, Addendum # 2

Legal Name of Bidder: Water & Air Research, Inc

DBA: Water and Air Research, Inc.

Authorized Representative Name/Title: Barry L. Vance; President and CEO

E-mail Address: bvance@waterandair.com FEIN: 59-1302326

Street Address: 6821 SW Archer Road, Gainesville, Florida, 32608

Mailing Address (if different):

Telephone: (352) 372-1500 Fax: (352) 378-1500

By signing this form, I acknowledge I have read and understand, and my business complies with all General Conditions and requirements set forth herein; and,

☑ Proposal is in full compliance with the Specifications.

☐ Proposal is in full compliance with the Specifications except as specifically stated and attached hereto.

SIGNATURE OF AUTHORIZED REPRESENTATIVE:

SIGNER'S PRINTED NAME: Barry L. Vance **DATE:** 06/27/2023

This page must be completed and uploaded to DemandStar.com with your Submittal.

ADDENDUM NO. 1

Date: June 7, 2023

Bid Date: June 22, 2023
at 3:00 P.M. (Local Time)

Bid Name Ecological Analysis and Tree Inventory

Bid No.: PWDA-230046-DH

NOTE: This Addendum has been issued only to the holders of record of the specifications.

The original Specifications remain in full force and effect except as revised by the following changes which shall take precedence over anything to the contrary:

1. Any questions shall be submitted in writing to the City of Gainesville Purchasing Division by 3:00 p.m. (local time), June 15, 2023. Questions may be submitted as follows:
Email: holderds@gainesville.org

2. Please find attached:

   a) Copy of the cone of silence information (Financial Procedures Manual Section 41-524 Prohibition of Lobbying in Procurement Matters)).

The following are answers/clarifications to questions received:

3. Question: Please confirm that the June 8 pre-bid meeting is non-mandatory.
   Answer: It is non-mandatory.

4. Question: Would the city consider awarding Tasks 2.0, 3.0, and 4.0 to more than one vendor? For example, Task 2.0 is performed entirely by Vendor A; Task 3.0 entirely by Vendor B; and Task 4.0 entirely by Vendor C.
   Answer: No.

5. Question: Page 5 – Tree Inventory Specifications
   a. Are you asking for a photo of <u>each</u> tree? Entire tree, or trunk eye level closeup?
   b. What are the DBH classes for sampling? 1 inch (8, 9, 10,…etc), 2 inch (8-9, 10-11, 12-13,…etc) or 6 inch (8-13, 14-18, 19-24,…etc)
   c. What are the height and crown spread classes for sampling? Nearest foot, five feet, 10 feet, etc?
   d. Are you asking for the location of <u>all</u> potential planting spaces in streets and parks? Will the city delineate areas in parks that they intend to maintain as open/treeless areas?

   Answer: a. Photo of each tree. Best reasonably available shot that best depicts the tree, preferably of majority of tree, if that is the best depiction in the professional opinion of the surveyor.
   b. 1 inch DBH classes.
   c. 10 foot classes for height and crown spread
   d. Potential planting spaces only in street ROW's

6. Question: Page 6 -Urban Ecosystem Analysis
    a. Will the city assist with attaining property owner permission to access iTree Eco plots located on private property? In past projects, the client has sent letters to plot owners and we have collected their responses using a page posted on our company website.
    b. If plot locations are needed in addition to the 2016 plot locations to provide at least 150 plots, can the Alachua County Property Appraiser's office provide shape files with land use classifications and other GIS information needed to create the new plot locations so that all land use classifications are recognized in proportion to the amount of area in the city they occupy?

    Answer: a. Yes, the City will assist as in past projects.
    b. This information is available for download from the Alachua County Property Appraiser's website. The City can provide appropriate URL's for this access, and assistance in accessing. Be advised: the Appraiser's land use classification is not always up-to-date.

7. Question: One more question. In your applicant scoring, would it be possible to give extra points to vendors whose **primary** headquarters location is within the State of Florida?

    Answer: See Section 8.2 Local Preference and Section 8.3 Small and Service Disabled Veteran Business Participation for scoring preferences. The scoring process is provided in the Professional Services Evaluation Handbook.

8. Question: Is there an option to join the pre-bid meeting for Ecological Analysis and Tree Inventory RFP virtually? Or if attendance is allowed only in-person.

    Answer: In-person only.

ACKNOWLEDGMENT: Each Proposer shall acknowledge receipt of this Addendum No. 1 by his or her signature below, **and a copy of this Addendum to be returned with proposal.**

CERTIFICATION BY PROPOSER

The undersigned acknowledges receipt of this Addendum No. 1 and the Proposal submitted is in accordance with information, instructions, and stipulations set forth herein.

PROPOSER: Water & Air Research, Inc.

BY: Barry L. Vance; President & CEO

DATE: 06/27/2023

41-524 Prohibition of Lobbying in Procurement Matters

Except as expressly set forth in Resolution 170116, Section 9, during the Cone of Silence as defined herein no person may lobby, on behalf of a competing party in a particular procurement process, City Officials or employees, except the Procurement Division or the procurement designated staff contact person. Violation of this provision shall result in disqualification of the party on whose behalf the lobbying occurred.

Cone of Silence period means the period between the issue date which allows for immediate submittals to the City of Gainesville Procurement Division in response to an invitation to bid, or a request for proposal, or qualifications, or information, or an invitation to negotiate, as applicable, and the time that City Officials or the Procurement Division, or City Department awards the contract.

Lobbying means when a person seeks to influence or attempt to influence City Officials or employees with respect to a decision of the City, except as authorized by procurement procedures.

City of Gainesville

Financial Services Department
Procurement Division

ADDENDUM NO. 2

Date: June 16, 2022

Bid Date: ~~June 22, 2023~~
June 27, 2023
at 3:00 P.M. (Local Time)

Bid Name Ecological Analysis and Tree Inventory

Bid No.: PWDA-230046-DH

NOTE: This Addendum has been issued only to the holders of record of the specifications and to the attendees of the non-mandatory pre-bid conference held on June 8, 2023.

The original Specifications remain in full force and effect except as revised by the following changes, which shall take precedence over anything to the contrary:

1. Any questions shall be submitted in writing to the City of Gainesville Purchasing Division by 3:00 p.m. (local time), June 15, 2023**.** Questions may be submitted as follows:
   Email: holderds@cityofgainesville.org

Note Change:

THE **DUE DATE FOR UPLOADING PROPOSAL is hereby extended to June 27, 2023.**

2. Please find attached:

   a) Copy of the cone of silence information (Financial Procedures Manual Section 41-524 Prohibition of Lobbying in Procurement Matters).
   b) Copy of the Pre-Bid sign-in sheet for your information.

3. Diane Holder, Procurement Division, discussed bid requirements.

   a. Sign-in Sheet is circulating.
      i. Submitted bid to match business name as signed in at pre-bid.
   b. Bid responses must be uploaded into Demandstar prior to 3:00 p.m. on June 27, 2023. Any bids received after 3:00 p.m. on that date will not be accepted.
   c. Send questions in writing to Diane Holder via email.
      i. All communication through Diane Holder or other Procurement Staff only. Do not communicate with other City staff.
   d. Various forms (i.e. cover page, bid form, see Part 8-Exhibits) are to be completed and must be returned with your bid.
      i. Sign, date and return all Addenda.

4. Dave Conser, Public Works, discussed the project scope
    - Last time performed was in 1995 for a limited Tree Inventory, and 2016 for an Ecological Analysis
    - On 176 plots in the past, only specifying 150 plots
    - City will help get access to private properties
    - Part 2 is the tree inventory –Urban trees in the Parks within 100 feet of those areas

The following are answers/clarifications to questions received at the non-mandatory pre-bid conference:

5. Question: How big are the plots?
   Answer: 1/10 of an acre.

6. Question: Do you want to include the picnic areas?
   Answer: Yes, picnic tables within urbanized areas of parks – said urbanized areas as defined in the RFP.

7. Question: There was 176 Plots Established last year, do you want a 150 in addition to the 176 from last year?
   Answer: If you can find the same plots of the original 176 please revisit those, but a minimum of 150. Preferring you visit the prior points as much as possible.

8. Question: Are there GPS locate plot points for the original 176?
   Answer: I believe so. I will help assist you with that. A stratified random sampling approach will be used to distribute these plots across land use.

9. Question: So you would say to aim for those original 177 find as many as you can and if it we can't find all of the 177 at least find 150?
   Answer: Yes.

10. Question: The aerial photos were last taken in 2016, so we are comparing 2016 until now?
    Answer: Correct. Work off of the 2016 analysis. Please include only 1995, 2005, 2016 and 2023. Not every single year. 1995, 2005 and 2016 were previously done, but I'm not sure of the availability of that raw data

11. Question: For the aerial, are we looking at 2023 data and comparing it to the 2016 data?
    Answer: Forest Canopy comparison from 2023 and comparing it to the 2016 forestry canopy data only, not every single year just the years of 2016 up against 2023. Please include only 1995, 2005, 2016 and 2023. Not every single year. 1995, 2005 and 2016 were previously done, but I'm not sure of the availability of that raw data

12. Question: If we do a finer imagery is that ok? The old imagery was 30 meters is using 5 meter imagery ok?
    Answer: I want you to be the most accurate in this latest iteration.

13. Question: You don't have specific tape files already that delineate?
    Answer: Take a look at the property appraiser's website.

14. Question: The tree diameter cut off is 8 inches in diameter?
    Answer: Yes, for the Inventory. For the Ecological Analysis plots, 1 inch and up. Percentage ground cover and percentage shrub cover.

15. Question: The cut off is 8 inches for right of way trees?
    Answer: Yes, the cut off for right of way trees is 8 inches.

16. Question: There are places like East side of Waldo RD there is a pretty wide area then there is the trail, is that whole region part of this as well?
    Answer: We are looking for right of ways owned by the City of Gainesville. City owned trees. The Waldo Road Greenway is owned by PRCA – it is a park. Please do a Tree Inventory for the ROW, and a separate Tree Inventory for the Park. Same data.

17. Question: For the Tree Plotter Software, do we have to have our own access or can we use the city's access?
    Answer: The awarded contractor can use the City's TreePlotter subscription.

18. Question: Is there data for the trees that have been planted?
    Answer: Yes, there is limited data on that, it may not do any good because a lot of those trees may not be 8 inches.

19. Question: Is there a precision standard for GPSing the trees?
    Answer: No.

20. Question: Is using a phone GPS adequate? It may be under 10 meter. It depends on your signal where you are standing.
    Answer: I'm not sure a phone would be good enough. I would purchase Bad Elf to be accurate.

21. Question: Risk assessment 100 ft rule?
    Answer: I want to know what can reach urbanized areas as defined in the RFP..

22. Question: The 1 inch diameter trees at the plots, do you want to know species?
    Answer: Yes.

23. Question: For the inventory, what are the things you'd like us to collect?
    Answer: Mandatory collection items are listed in the RFP.

24. Question: In a situation like this, we have a park and then we have the right of way those are analyzed differently?
    Answer: You have the Tree Inventory of both right of way trees and Park's trees. We want the same data, same analysis, but please distinguish right of way trees from Park's trees.

25. Question: Do you want different data for the Park Trees versus the right of ways Trees?
    Answer: Yes, I would like to delineate between the park trees versus the right of way trees. Same data for both.

26. Question: What are the areas that fall into the 100ft rule areas?
    Answer: The 100ft rule areas are listed in the RFP.

27. Question: Are you wanting us to make the data sheet form that we'll use in TreePlotter or will you provide it?
    Answer: I will make it and provide it to the individuals using TreePlotter. The awarded contractor can use the City's TreePlotter subscription.

28. Question: For the tree inventory what program will be used? And you will provide a data form for that also (for the plot analysis)?
    Answer: TreePlotter will be the program used. Yes, we will provide the data form.

29. Question: Will you be providing the data sheet for the plot analysis?
    Answer: Yes, I will provide the data form for the plot analysis.

30. Question: Do you have an idea of what QA/ QC you are expecting?
    Answer: There is nothing specified on a percentage of plots checked.

31. Question: About the canopy cover analysis, are you ok with just aerial?
    Answer: Yes, just remote sensing is acceptable. Please see RFP for details listed for canopy cover.

32. Question: Can we see the contracts dealing with the plots and canopy Analysis?
    Answer: You can look at the previous ecological analysis and see what the UF did and how they did it. We don't have the contracts.

33. Question: Can we see what the City paid them to do this?
    Answer: The City does not have that information.

34. Question: Do you have the previous imagery from previous years in your files?
    Answer: No. You'd have to find it. Aerial imagery publicly available. The RFP references sources.

35. Question Is this all that is really required?
    Answer: Go with what is in the proposal. It is mandatory to provide references and have a certified Arborist on staff.

The following are answers/clarifications to questions received after the non-mandatory pre-bid conference:

36. Question: On Page 11 of the RFP, there are two separate lists explaining formatting and contents respectively, reproduced here:

    FORMAT OF PROPOSAL
    a) Table of Contents
    b) Technical Proposals
    c) Price Proposal
    d) Qualifications

and

CONTENT OF PROPOSAL

a. RFP Cover Page
b. Address each Minimum Qualification
c. Provide a Statement of all Qualifications that will communicate the capabilities of the proposer to successfully complete the project
d. Pricing Proposal
e. Drug-Free Workplace Form
f. Bidder Verification Form
g. References Form
h. Bidder's W-9
i. Copy of any applicable, current licenses and/or certification required by City/County/State
j. Exceptions to the RFP (refer to Part 4, 4.5 Exception to the RFP)
k. Copy of Certification of Arborist

Am I correct in thinking that we don't actually need to submit a Technical Proposal or Table of Contents since neither are in the second list? It seems that the Technical Proposal is functionally provided by you in the RFP's Project Overview.

Answer: The first list outlines the Format of your proposal and the second list outlines the content to be included within the format of your proposal. You should include a Table of Contents and Technical proposal. The Technical Proposal should be a narrative as stated in 4.1 b) of the RFP document.

37. Question: If the 100 feet during the tree inventory extends onto the private property limits, do we stop or get permission first?

Answer: Stop. We are only inventorying City-owned trees.

38. Question: Does the city want some of the sampling to be performed during a certain time of the year (e.g., growing season vs winter)?

Answer: Great question. Sample when leaves are fully expressed, so as to adequately assess the tree.

39. Questions: Under City Assistance, on page eight, it states, " The City will provide access to the TreePlotter software for inventory data collection." Must the successful vendor purchase any licensing from Tree Plotter? Or will that cost be wholly undertaken by the City?

Answer: Yes the contractor can use the City's TreePlotter subscription.

40. Question: To clarify, must the Tree Inventory portion of the project be spread over 3 years, or can it be completed prior to September 2026?

Answer: The Inventory can be completed as soon as possible.

41. Question: Hardware Requirements
I understand a range finder and GPS are required. What additional hardware is expected/required for this project? (i.e. laptop, tablet, etc.)

Answer: Whatever the Proposer needs to collect the data. This could be a tablet, or data recorder of their preference.

42. Question: Must the GPS devices meet the requirements of submeter accuracy?
Answer: No

NOTE: The Professional Services Handbook is the tool/guide used for evaluation. Requirements specific to this project are listed in the RFP.

NOTE: As far as inventory goes in finding right of ways. We can give you some good standard procedures for doing that. Light poles and power poles are poor indicators of ROW. The property appraiser's website is the best tool. You can pull that up on your electronic device. You can find road widths and generally pull from the middle of the road. For example, for a 50' wide ROW, you could measure 25' from the middle of the road, generally. Also, one of your best tools is the expansion joint between the apron and the rest of the driveway. Almost, always right on the right of way line. You can use that if you have that. Within the department we have good intelligence on how to find right of ways and can work with you some on that, but you should do it yourself. If something gets off we are available for some assistance.

ACKNOWLEDGMENT: Each Proposer shall acknowledge receipt of this Addendum No. 2 by his or her signature below, **and a copy of this Addendum is to be returned with proposal.**

CERTIFICATION BY PROPOSER

The undersigned acknowledges receipt of this Addendum No. 2 and the Proposal submitted is in accordance with information, instructions, and stipulations set forth herein.

PROPOSER: Water & Air Research, Inc.

BY: Barry L. Vance; President & CEO

DATE: 6/27/2023

41-524 Prohibition of Lobbying in Procurement Matters

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Cone of Silence period means the period between the issue date which allows for immediate submittals to the City of Gainesville Procurement Division in response to an invitation to bid, or a request for proposal, or qualifications, or information, or an invitation to negotiate, as applicable, and the time that City Officials or the Procurement Division, or City Department awards the contract.

Lobbying means when a person seeks to influence or attempt to influence City Officials or employees with respect to a decision of the City, except as authorized by procurement procedures.

Water & Air Statement of Qualifications

Water & Air and Team Overview

Water & Air Research, Inc. (Water & Air) is a 53-year-old multidisciplinary environmental consulting firm based in ***Gainesville, Florida***, dedicated to promoting environmental responsibility through the sharing of our knowledge with the people and organizations we serve. Since 1970, our engineers, biologists, environmental scientists, geologists, and planners have provided a wide range of environmental services to private and public-sector clients throughout Florida. For the City's RFP, relevant services provided include Biological Monitoring, Environmental Assessment, and Environmental Planning. Water & Air has specific experience completing Tree Surveys, Ecological Monitoring/Analysis/Reporting, natural area Aerial Image Interpretation/Change Analysis, and quantitative comprehensive plant Surveys and Inventories.

Water & Air has a total of 22 full-time employees and 14 part-time employees. The company possesses the equipment and vehicles necessary to complete the planning, ecological analysis, and tree inventory project. Water & Air has an average annual volume of work (past 3 years) of $3,536,663.00.

Water & Air, with the support of our sub-respondents, is ready to provide Ecological Analysis and Tree Inventory services as specified in RFP #: PWDA-230046-DH. We understand that the mission of the CITY is *to build community* and specific to this RFP, to document the diversity and health (risk) of the urban tree forest, to track forest and canopy changes over time, and to quantify the benefits of the CITY'S Urban Forest relating to urban hydrological benefits, carbon capture, extreme temperature moderation and quality of life. To support the mission, the CITY requires high quality environmental data, compatible with accepted data quality standards, and delivered in a timely manner by respected and credentialed environmental professionals.

Water & Air's experience providing services to the CITY and other municipalities has taught us:

- Projects vary significantly in complexity, duration, and scope requiring a project specific level of planning and communication for successful completion.
- Information provided to the CITY staff must be able to withstand legal scrutiny and technical challenges.
- Consultants work as an extension to CITY staff who sometimes face limited resources to obtain needed data and analyses to fulfill the CITY's mission.

Within the last five years Water & Air has completed or is conducting the following related projects:

- Ecological Monitoring and Environment Assessment of a 130-square mile Study Area, Tampa Bay Water, Hillsborough, Pasco and Pinellas Counties, Florida.
- Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I, Gainesville, Florida.
- Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study, Hendry County, Florida.
- Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting, Dixie County, Florida.
- Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River, Levy and Citrus Counties, Florida.
- Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site, Escambia County, Florida.
- Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir, Hillsborough County, Florida.

The Project Team was selected and assembled by Water & Air to provide services that complement our technical strengths. Sub-respondents are highly experienced and respected consulting firms and individuals with specific expertise that elevates our team. Water & Air has worked with and relied on these team members to complete numerous projects which has resulted in positive and established working relationships with Water & Air's key staff. An overview of the sub-respondents' capabilities are outlined below.

Water & Air project managers will lead the **Ecological Analysis and Tree Inventory** services with support provided by Water & Air biologists, engineers, environmental scientists, and technical staff. In addition, Water & Air is teaming with local experts on aerial imagery analysis, GIS change analysis, and arborist services. Key personnel descriptions and roles are listed below. Additional professional service experience by key personnel is also detailed in the Resumes Section.

Water & Air Key Personnel

Jim Surdick, PhD, has 33 years experience as an environmental scientist working throughout Florida in upland, wetland, and coastal ecosystems and is an expert on listed plant and animal species surveys, natural community mapping, reporting, and data analysis. While at Water & Air, he has led field work, data management and analysis, reporting, and plant identification.

Barry Vance is a biologist based out of southern Marion County who works in both terrestrial and aquatic systems projects at Water & Air. His experience includes biological site evaluations, land use mapping, vegetation monitoring, ground and surface water and sediment sampling, macroinvertebrate collection, fish and wildlife data collection and endangered and threatened species surveys. He is a FWC Authorized Gopher Tortoise Agent and Wetland Assessment Procedure trained.

Peter NeSmith, PWS, is a botanist with 35 years of experience in identifying and characterizing native vegetation of the southeastern U.S. His experience includes plant identification, vegetation community identification and mapping, native plant propagation, cultivation, and use in ecosystem restoration and enhancement, and ecological assessments. He has served as the field botanist and project manager for projects involving quantitative vegetative and hydrologic monitoring to determine changes in cypress dome systems in response to climate, land use, and surface water alterations, and wellfield production for public supply.

Eric Nelson has approximately 40 years of experience in project management for environmental permitting, working for private firms and the federal government, and as an aquatic research biologist working for state and federal resource agencies. He has experience in wetland assessment, wetland delineations, terrestrial and aquatic biological species assessments, environmental assessments, Phase I contaminant assessments, and mitigation development and monitoring. He has worked throughout the state of Florida and in the Southeastern U.S., including energy and transportation corridors, mining development, and water use and treatment projects.

Sky Notestein has approximately 22 years of environmental science experience working for state government and private firms. He has demonstrated experience in lab and personnel management, project management, aquatic, wetland, and terrestrial ecology, natural resource restoration, and water use permitting. He has experience in wetland assessment, wetland delineations, terrestrial and aquatic biological species assessments, environmental assessment, and projects including residential developments, water utilities, and restoration projects.

Tyler Leslie has 18 years of experience working in both terrestrial and aquatic systems. His terrestrial system experience includes biological site evaluations, exotic and invasive plant control, vegetation monitoring, groundwater sampling and monitoring, and gopher tortoise permitting and relocation. In both

fresh and saltwater aquatic systems, his experience includes water quality sampling, wetland monitoring, macroinvertebrate collection and identification, vegetation surveys, and fish and wildlife data collection. He has managed several projects and prepared numerous technical reports.

Mark McManus has 31 years of professional experience in all phases of AutoCAD drafting and mapping, including natural resource mapping, air and water pollutant dispersion, planning and ecological studies, civil engineering, cultural resources, environmental assessments, and geological studies. While with Water & Air he has portrayed data for every type of project including the preparation of CAD drawings and/or GIS mapping for ecological evaluations, habitat management plans, land use mapping projects, compatible use zone studies, and planning studies.

Additional staff available for completion of field activities:

Gary Schultz has nearly 40 years of experience as a Botanist and Ecologist and was employed in these roles with the Florida Natural Areas Inventory (FNAI), at Florida State University for 27 years. Mr. Schultz is an experienced botanist and ecologist who has completed projects throughout Florida. Mr. Schultz has expertise in plant identification and rare plant and animal population surveys.

Bella Grezik has 7 years of experience in both terrestrial and aquatic systems as an environmental scientist. She has assisted in field surveys, reporting, and project management for listed species, wetland delineations, wetland monitoring, gopher tortoise permitting and relocation, submerged aquatic vegetation monitoring, water quality monitoring, and biological assessments.

Niamh Meyler has 6 years of experience as an environmental scientist. She has assisted in field surveys, reporting, and project management for listed species, gopher tortoise permitting and relocation, submerged aquatic vegetation monitoring, water quality monitoring, marine taxonomy, and biological assessments. Niamh has prior work experience as a supervisor of education at Marineland, Florida.

Paislee Peyton has 2 years of experience as an environmental scientist. She performs project management and field work for surface water, groundwater, soil and sediment sampling activities, data review and validation, and creates reports. She is familiar with a wide variety of laboratory techniques, ion chromatography, and microbiological testing.

Sub-Respondents

Water & Air has teamed with **BG Ormiston PhD Ecological Consultant** of Safety Harbor, Florida. *He will be the Task Manager and support GIS analysis of aerial imagery, vegetation classification/change analysis, as well as an overall ecological analysis of the forest resources within the CITY.* Dr. Ormiston has nearly 40 years of professional experience as a PhD conducting research studies and has been using aerial photography, GIS and digital remote sensing imagery (satellite and airborne imaging systems) since the late 1980s. He has project experience with a variety of satellite and airborne imagery including Landsat satellites, Sentinel 2 and digital aerial systems including the Leica ADS-40 and ADS-100 multispectral camera systems as well as hyperspectral airborne systems such as CASI and AISA-Eagle. *His experience includes tree canopy cover estimation, species mapping, tree canopy change detection analysis in both natural and urban environments, and exotic species mapping and monitoring.* He has performed numerous projects in support of Water and Air Research Inc. since the 1990s. He received his initial training in photointerpretation in a graduate field ecology methods class at the University of Miami (Florida) in 1974 and obtained additional training and certification from the US Fish and Wildlife Service's National Wetland Inventory Program in 1987. He has had additional continuing education from Space Imaging Inc. and three decades of experience with digital remote sensing products including Multispectral and Hyperspectral systems. He has been an FAA certified aircraft pilot since 1991 holding an instrument rating, high performance aircraft rating, and has a current commercial FAA UAV

(unmanned aerial vehicle or drone) license. He has conducted remote sensing projects including vegetation inventory, classification and change analyses, and hyperspectral mapping of exotic species for environmental management. He has provided consultant support to numerous agencies including SWFWMD, SJRWMD, FDOT, NASA, USGS, and the Florida Natural Areas Inventory. His received a BS in Biology from the University of Miami and a PhD in Ecology the SUNY Stony Brook.

Another key part of the Water & Air team is **Kelly McPherson of Workman Forestry, LLC**. Kelly is an International Society of Arboriculture Certified Arborist (ISA FL-9575A) with an MS in Botany from the University of Florida. *Kelly will support technical staff with tree data collection training based on ISA standards including Level I risk assessment. She will assist with QA/QC of initial field surveys and data collection using a randomized field assessment of inventoried trees, including tree plot analysis. Field activities will be QA/QC'd early in the data gathering process to ensure accurate data collection.* As an arborist, Kelly provides tree surveys, inventories, and assessments including Level I and II tree risk assessments within Gainesville and surrounding areas. Kelly has extensive professional work experience in GIS/Mapping and land management planning and has previously worked for the Florida Park Service and Alachua County Forever Land Conservation Program.

Additional depth to the Water & Air team is added by **Erick Smith of Kestrel Ecology, Inc.** who *will support Kelly and technical staff with tree data collection training based on ISA standards including Level I risk assessment, assist with QA/QC of initial field surveys and data collection, and assessment of inventoried trees, including tree plot analysis.* Erick is an International Society of Arboriculture Certified Arborist (ISA FL-5376A-under renewal) with an BS in Forestry from the University of Florida. For seven years Erick was an urban forester with the University of Florida whose primary responsibility was the health, safety, diversity and caretaker of UF's 2,000-acre campus. As an arborist and co-owner of Kestrel Ecology, Erick has performed arborist consulting for residential and commercial clients, invasive/exotic plant surveys and control, ecological monitoring and biological inventories. Erick has worked for the Wildland Urban Interface Center designing and implementing a residential landscaping fire behavior experiment and as the Florida State Parks exotic plant liaison.

Client Name: Tampa Bay Water **Project Number: 1**

Project Name: Ecological Monitoring and Environment Assessment of a 130-square mile Study Area

Location: Hillsborough Pinellas, Pasco Counties, Florida

Project Description: In 1982, Water & Air was contracted by Tampa Bay to design, implement, and maintain an ecological monitoring network and environmental assessment program for a 130-square mile study area in northwest Hillsborough and adjacent Pinellas and Pasco Counties, Florida. The program complied with conditions specified by the Southwest Florida Water Management District and water use permit.

For several decades Water & Air completed annual Wetland Assessment Procedure (WAP) monitoring at 68 permanent Forest Inventory plots to determine groundcover, shrub, and tree species cover, size classes, diversity, distribution and change over time.

Three decades of Aerial Photographic Interpretation (with sub-consultant Dr. Brian Ormiston) provided a regional perspective of environmental conditions, forest canopy change, vegetation health and regional development trends. Products produced for Tampa Bay Water included the Aerial Photo Interpretation report and change comparison dating for each of the 68 monitored weltands and over 70 lakes begninning with 1950's aerial photographs.

Other data used in the environmental assessment included ground photography, wetland assessments and mapping, wetland jurisdictional line delineation, soil assessments, wildlife observations, precipitation accumulation and distribution, surface and groundwater levels, stream flow, and production water quality and quantities. The monitoring data are analyzed to determine if hydrologic or vegetation change has occurred.

Contract Start: 1983 **Contract End:** Current.

Contact/Reference Information:
Mr. Doug Keesecker
Tampa Bay Water
2575 Enterprise Road
Clearwater, Florida 33763
727.791.2348
dkeesecker@tampabaywater.org

Project Members & Roles: Peter NeSmith, Project Manager/Scientist. Jim Surdick, Barry Vance, Tyler Leslie, Project Scientists. Mark McManus, GIS/CAD Specialist. **Brian G. Ormiston, PhD**, Ecological Consultant; aerial and remote sensing interpretation and processing.

Client Name: Housing Trust Group LLC (HTG)	**Project Number: 2**
Project Name: HTG Listed Species and Tree Surveys, Wetland Delineation, and Phase I, Gainesville, FL	
Location: 612 Southeast 21st Street, Gainesville, Alachua County, Florida	
Project Description: Water & Air provided county required environmental services for a potential Environmental Resource Permit for a low income housing development in Gainesville, FL. Two scientists performed a tree survey in accordance with City of Gainesville tree regulations (Chapter 30 Land Development Code, Article VIII, Division 2, Sections 30-8.7-30- 8.10) from September 1, 2, and 3, 2020. Regulated trees are those of eight inches or greater in diameter at breast height (dbh). Slash (*Pinus elliottii*) and Loblolly (*Pinus taeda*) pines are not regulated until they reach 20 inches in diameter. Regulated trees were flagged (labeled with species name and diameter at breast height (dbh), and location points were recorded with an iPad connected to a GPS unit. There were 259 regulated trees within the uplands on the Project Site, including four red maple (*Acer rubrum*), 29 camphortree (*Cinnamomum camphora*), one dahoon (*Ilex cassine*), two American holly (*Ilex opaca*), two sweetgum (*Liquidambar styraciflua*), two southern magnolia (*Magnolia grandiflora*), two sweetbay (*Magnolia virginiana*), one black tupelo (*Nyssa sylvatica*), 20 slash pine, 16 longleaf pine (*Pinus palustris*), one pond pine (*P. serotina*), 19 loblolly pine, one black cherry (*Prunus serotina*), 102 laurel oak (*Quercus laurifolia*), 46 water oak (*Quercus nigra*), 10 live oak (*Quercus virginiana*), and 1 cabbage palm (*Sabal palmetto*).	
Contract Start: August 2020 **Contract End:** November 2020	
Contact/Reference Information: Mr. Jordan Finkelman Housing Trust Group LLC (HTG) 3225 Aviation avenue, 6th Floor, Coconut Grove, FL 33133 Phone: 305-860-8188 Email: jordanf@htgf.com	
Project Members and Roles: Eric Nelson, Project Manager. Jim Surdick, Project Scientist. Tyler Leslie, Project Scientist.	

Client Name: Seminole Tribe of Florida	**Project Number: 3**
Project Name: Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study	
Location: Big Cypress Seminole Indian Native Area (BCSIR), Hendry County, Florida	
Project Description: Water & Air completed dry and wet season (growing season) Forest Inventory and Analysis (United States Forest Service) monitoring for ten sampling sites within the BCSIR Native Area and two reference locations in the Big Cypress National Preserve. Water & Air conducted a 100% inventory of plant species found within 84 0.25-acre radius plots. Habitat Sampling included Vegetation Cover Estimates, The total percent cover for each of the predefined vegetation layer classes including trees, tall shrubs/saplings/woody vines, short shrubs, groundcover, perched groundcover, free-floating aquatic plants and epiphytes was estimated within each subplot. Tree cover was estimated for both the subplot and macroplot. Cover estimates included total percent cover by layer, species percent cover, total aerial cover and sample site photographs Tree measurement data included tree basal area, height and diameter at breast height (DBH) for each tree greater than or equal to 5-inch DBH. The Forest Inventory included sapling, large shrub measurements and seedling counts. Trees with a diameter at least 1.0 inch but less than 5.0 inches, large shrubs and saplings, were sampled within each 6.8-foot radius microplot. Collected information included species, a unique ID tag number, azimuth from the center point, DBH, and approximate height. Downed woody material was and observations of plant hydrological stress, insect damage, disease, estimated last fire, fine fuel continuity, epiphyte host ratios, plant phenology, and the abundance of the lichens and fungus were opportunistically recorded within each subplot. Analyses included species richness the number of taxa/species/types present in an assemblage, community, or sample plot was calculated for each macroplot, subplot, and sample site (combination of the four subplots). Other analyses included Simpson's diversity index, floristic quality assessment and hydroperiod indicator scores. Water & Air Research (Water & Air) conducted a comprehensive research, inventory, and analysis for historical hydrologic data with an emphasis on pre-development wetland slough systems for the Big Cypress Native Area. Inventories of all existing relevant STOF Native Area studies and resources including historical hydrologic data, aerial imagery, LiDAR data, and vegetative mapping information were completed. The information was used to map (using GIS) historical slough systems and to place BCSIR Native Area reference sites for consideration under the currently proposed objectives. These data were used to create an evaluation matrix for off-reservation reference sites. Off Reservation reference locations were selected to target similar habitats that persist on reservation that are more representative of historical deep cypress slough systems. These locations may exhibit less impact from the regional drainage system and anthropogenic stressors.	
Contract Start: February 2022 **Contract End:** September 2022	
Contact/Reference Information: Ms. Karli Eckel Environmental Resource Dept, Seminole Tribe of Florida, Brighton Indian Reservation 650 Harney Pond Road, NE, Room #108J, Okeechobee, Florida 34974 863-763-4128 karlieckel@semtribe.com	
Project Members and Roles: Eric Nelson, Project Manager. Jim Surdick, Project Scientist. Peter NeSmith, Project Scientist. Tyler Leslie, Project Scientist. Mark McManus, CAD/GIS.	

Client Name: Yellow Jacket RV Resort	**Project Number: 4**
Project Name: Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting	
Location: Yellow Jacket RV Resort, Old Town, Dixie County, Florida	
Project Description: Water & Air provided environmental assistance for an environmental resource permit application to the Suwannee River Water Management District to add additional recreational vehicle parking spots, buildings, and a fuel depot. Environmental/Ecological Survey, which included an upland tree survey, wetland delineation and determination of the mean high-water line on the Suwannee River. In addition, Water & Air documented the presence of State or Federal listed species. In April, 2023, Water & Air scientists conducted a comprehensive tree survey in the upland habitat of the 29-acre site. Each tree was identified to species, the diameter measured at breast height (DHB), and the location recorded with a sub-meter GPS. Trees > 8 inches DBH were included in the survey. Tree species measured included American elm (*Ulmus americana*), bald cypress (*Taxodium distichum*), cabbage palm (*Sabal palmetto*), laurel oak (*Quercus laurifolia*), live oak (*Quercus virginiana*), loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), swamp tupelo (*Nyssa sylvatica*), sweetgum, and water oak. A total of 666 trees were measured and ranged in size from 8 to 42 inches DBH.	
Contract Start: 12/28/2022, **Contract End:** Current.	
Contact/Reference Information: Mr. Ron Oxendine Yellow Jacket RV Resort 55 Southeast 503rd Avenue, Old Town, Florida 32680 Email: info@yellowjacketrvresort.com	
Project Members and Roles: Eric Nelson, Project Manager. Jim Surdick, Project Scientist. Tyler Leslie, Project Scientist.	

Client Name: Southwest Florida Water Management District	**Project Number: 5**
Project Name: Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River	
Location: Lower Withlacoochee River, Florida	
Project Description: The purpose of this study was to gather data for the Southwest Florida Water Management District (District) to assist in the evaluation of the minimum flows and levels (MFLs) and hydrodynamic model development for the Withlacoochee River system. Water & Air scientists mapped all tree, shrub and groundcover vegetation in the natural portions of shoreline of the Lower Withlacoochee River, characterized shoreline emergent vegetation and documented altered portions of the shoreline. The results were then compared to previous monitoring and mapping efforts to assess changes in shoreline vegetation, particularly the bald cypress (*Taxodium distichum*) canopy, which may be related to flow, salinity, and other factors considered during the MFL revaluation process. Historical and current high resolution aerial photography was interpreted prior to conducting the field work. The shoreline of the 15-kilometer tidally influenced Lower Withlacoochee River (including tributaries) was delineated and mapped in 30-foot segments. Vegetation data for each distinct species was classified as dominant, co-dominant or present to characterize relative abundance for each of the 5,417 mapped river segments. Additionally, bald cypress trees were quantitatively assessed for health and condition and mapped in the lower portion of the river as baseline documentation for future vegetative change studies to determine salinity increases and/or sea level rise within the Lower Withlacoochee River. All mapping and GIS layers were delivered with complete metadata in accordance with District standards.	
Contract Start: June 2021 **Contract End:** December 2021	
Contact/Reference Information: Kym Rouse Holzwart, M.S. Southwest Florida Water Management District 2379 Broad Street Brooksville, FL 34604 1-800-423-1476, ext. 4295 352-796-7211, ext. 4295 kym.holzwart@swfwmd.state.fl.us	
Project Members and Roles: Barry Vance, Project Manager. Jim Surdick, Project Scientist. Tyler Leslie, Project Scientist.	

Client Name: EBI Consulting	**Project Number: 6**
Project Name: Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site	
Location: Escambia County, Florida	
Project Description: The field surveys were conducted to delineate all wetland boundaries, dominant vegetation and vegetation types (natural communities) and the site was surveyed for trees 12 inches or greater and trees 60 inches or greater (heritage trees). Representative portions of the uplands and wetland were surveyed for listed plant and animal species.	
Contract Start: June 2014 **Contract End:** August 2014	
Contact/Reference Information: Ryan McKissock EBI Consulting 2030 Cordilleras Rd, Emerald Hills CA 94062 rmckissock@ebiconsulting.com	
Project Members and Roles: Peter NeSmith, Project Manager. Field surveys and reporting.	

Client Name: Arcadis (Prime for Client Tampa Bay Water)	**Project Number: 7**

Project Name: Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir

Location: Hillsborough County, Florida

Project Description: Environmental monitoring and aerial photointerpretation of uplands within Chito Branch Preserve adjacent to the Tampa Bay Regional Reservoir to document forested wetlands communities' response to reservoir leakance. The environmental monitoring was conducted to assure that operation of the region's surface water reservoir does not adversely affect surrounding forested wetland and upland communities due to leakance of water from the facility.

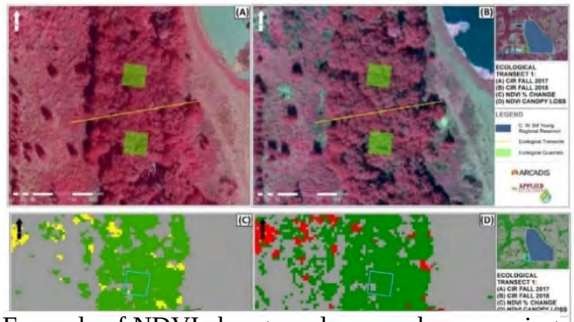
Brian Ormiston assisted with creating and implementing the quantitative forest monitoring plan and project and was responsible for the statistical analysis of environmental transect hydrology and for the remote sensing analysis and reporting (image processing, radiometric calibration, mosaicking and analysis of true multispectral Ikonos satellite imagery and aircraft-borne digital multispectral camera imagery including collected each dry and wet season. He provided the normalized difference vegetation index (NDVI) vegetation change detection products and implementation of results in GIS. Digital remote sensing report preparation, analysis of wetland transect surface water and groundwater data, and quality assurance tasks for annual report elements.

Contract Start: 2002 **Contract End:** 2020

Contact/Reference Information:
Mr. Doug Keesecker
Tampa Bay Water
2575 Enterprise Road
Clearwater, Florida 33763
727.791.2348
dkeesecker@tampabaywater.org

Project Members and Roles: Brian G. Ormiston – assisted with the creation and implementation of an environmental monitoring plan; statistical analysis of monitoring site data; remote sensing analysis and reporting; remote sensing image processing.

Picture:



Example of NDVI change and canopy loss mapping for one of the environmental monitoring transects (Transect #1) based on Fall 2018 (B) and 2017 (A) Imagery.

Project Matrix

Water & Air Research, Inc.		City of Gainesville RFP # PWDA-230046-DH Ecological Analysis and Tree Inventory				
Project Number	Project Name	Task 1.0 Project Planning	Task 2.0 Analysis of Tree Canopy using Remote Sensing Techniques	Task 3.0 Quantitative Vegetation Surveys and Ecological Analysis	Task 4.0 Tree Inventory	Task 5.0 Final Report
1	Ecological Monitoring and Environment Assessment of a 130-square mile Study Area, Hillsborough, Pinellas, Pasco Counties, Florida.	X	X	X	X	X
2	Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I, Gainesville, Florida.	X			X	X
3	Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study, Hendry County, Florida.	X	X	X	X	X
4	Tree, Listed Species and Ecological Surveys for Environmental Resource Permitting , Dixie County, Florida.	X	X		X	X
5	Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River , Levy and Citrus Counties, Florida.	X	X		X	X
6	Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site, Escambia County, Florida.	X		X	X	X
7	Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir, Hillsborough County, Florida.	X	X	X	X	X

BARRY L. VANCE

Senior Scientist and President

Ecological Analysis and Tree Inventory Role: Project Director

Barry is a field biologist with experience with both terrestrial and aquatic systems in Florida. He has performed environmental monitoring and site setup for water use permit compliance and is managing the hydrological and environmental monitoring for the Starkey and Morris Bridge Wellfields for the Southwest Florida Water Management District. Additional skills include GPS/GIS data acquisition using ArcGIS, aerial photographic interpretation, land use mapping, and database applications. His terrestrial system experience includes biological site evaluations, vegetation monitoring, groundwater sampling and monitoring, and performing endangered and threatened species surveys. He also provides gopher tortoise services as an Authorized Agent. In both fresh and saltwater aquatic systems, Barry's experience includes water quality sampling, wetland monitoring, macroinvertebrate collection, vegetation surveys, and fish and wildlife data collection. He is certified by the Florida Department of Environmental Protection to conduct the Stream Condition Index and Linear Vegetation Index assessments.

SELECTED PROJECT EXPERIENCE

Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River.
Client: Southwest Florida Water Management District.
Location: Levy and Citrus Counties, Florida. Role: *Project Manager.*

Ecological Monitoring and Environment Assessment of a 130-Square Mile Study Area.
Client: Tampa Bay Water.
Location: Hillsborough, Pinellas, and Pasco Counties, Florida. Role: *Project Scientist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a Proposed Cell Phone Tower Site.
Client: Tampa Bay Water.
Location: Escambia County, Florida. Role: *Project Scientist.*

Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir.
Client: Arcadis (Prime for Client Tampa Bay Water). Location: Hillsborough County, Florida. Role*: Project Scientist.*

CREDENTIALS/ORGANIZATIONS

- Florida Department of Environmental Protection Stream Condition Index
- Boating Safety Course
- CPR/First Aid Certified (March 2021)
- FWC Authorized Gopher Tortoise Agent
- PADI Open Water SCUBA Certified
- Bloodborne Pathogen Certified
- Wetland Assessment Procedure Training
- Emergency Oxygen Provider Certified

SKILLS

- Endangered and Threatened Species Surveys
- Exotic/Invasive Vegetation Survey/Control
- Water Quality and Wetland Mitigation Monitoring
- Lake Vegetation Index
- Stream Condition Index
- Stream and River Linear Vegetation Survey
- Vegetation Community Mapping
- Vegetation Surveys
- ArcMap GIS
- Soil Sample Collection
- Aerial Photo Interpretation
- Rapid Periphyton Assessment
- Side Scan Sonar
- Submeter GPS Data Acquisition
- Surface and groundwater Sampling
- Data Management

EDUCATION

- BS, Environmental Science, St. Leo University

YEARS OF EXPERIENCE

- Water & Air: 19
- Other Firms: 2

CONTACT

- bvance@waterandair.com

ERIC B. NELSON

Senior Scientist

Ecological Analysis and Tree Inventory Role: Project Scientist

Eric has approximately 40 years of experience in project management for environmental permitting, working for private firms and the federal government; and as an aquatic research biologist working for state and federal resource agencies. He has worked throughout Florida in small streams, large rivers, wetlands, and lakes, including Everglades National Park. Eric has experience in wetland assessment, wetland delineations, terrestrial and aquatic biological species assessments, environmental assessments, Phase I contaminant assessments, and mitigation development and monitoring. He has worked on small and large projects throughout the state of Florida and in the Southeastern U.S., including residential developments, highway transportation corridors, mining development, transmission corridors, and water use/treatment developments. He is familiar with the permitting process for all the water management districts, Florida Department of Environmental Protection, and U.S. Army Corps of Engineers. He is proficient in the collection and identification of freshwater macroinvertebrates, fish species, and aquatic plants. Eric is proficient in computer use for data management, statistical analysis, graphical presentations, and report creation. He is familiar with Trimble GPS units and ArcGIS.

SELECTED PROJECT EXPERIENCE

Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I.
Client: Housing Trust Group LLC
Location: Alachua County, Florida. Role*: Project Manager.*

Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study.
Client: Seminole Tribe of Florida. Location: Hendry County, Florida. Role: *Project Manager.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting.
Client: Yellow Jacket RV Resort. Location: Yellow Jacket RV Resort, Dixie County, Florida. Role*: Project Manager.*

Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River. Client: Southwest Florida Water Management District. Location: Levy and Citrus, Florida. *Role: Project Scientist.*

CREDENTIALS/ORGANIZATIONS

- FWC Authorized Gopher Tortoise Agent
- MSHA 8-hour HAZWOPER Refresher (January 2023)
- PADI Open Water Diver Certified
- Association of Aquatic Biologists
- Hydric Soils Specialized Training for Wetland Specialists by University of Florida
- United States Army Corps of Engineers Regulation IV Plant identification and basic wetland delineation training
- Florida Department of Transportation Hazardous Materials Transportation
- Boating Safety Course
- CPR/First Aid Certified (March 2023)

SKILLS

- Coastal and Estuarine Biology
- Development of Regional Impact Studies
- Environmental Planning and Monitoring
- Geographic Information System
- Hydric Soils Specialized Training
- Terrestrial and Wetland Biology
- Protected Species Surveys
- Wetland Delineation
- Wildlife Management Plans

EDUCATION

- MS, Fisheries and Wildlife, University of Missouri
- BS, Fisheries and Wildlife, University of Missouri

YEARS OF EXPERIENCE

- Water & Air: 4
- Other Firms: 32

CONTACT

- enelson@waterandair.com

JAMES A. SURDICK

Senior Scientist

Ecological Analysis and Tree Inventory Role: Project Scientist

Dr. Surdick has worked throughout Florida in upland, wetland and coastal ecosystems and is an expert on listed plant and animal species surveys, natural community mapping, reporting and data analysis. His research includes field experiments and surveys focused on the community structure and ecology of Florida plant and wildlife species. Dissertation research was focused on the amphibian and avian species composition of wetlands imbedded within a variety of landscape types distributed throughout Florida and master's research investigated the factors influencing wading bird site selection and foraging success within the Everglades. While at Water & Air, he has participated in field work, data management and analysis, reporting, and plant identification.

SELECTED PROJECT EXPERIENCE

Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I.
Client: Housing Trust Group LLC
Location: Alachua County, Florida. Role*: Project Scientist.*

Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River Update.
Client: Southwest Florida Water Management District.
Location: Levy and Citrus Counties, Florida. Role*: Project Scientist.*

Ecological Monitoring and Environment Assessment of a 130-square mile Study Area.
Client: Tampa Bay Water
Location: Hillsborough, Pinellas, and Pasco Counties, Florida. *Role: Project Scientist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting.
Client: Yellow Jacket RV Resort.
Location: Dixie County, Florida. *Role: Project Scientist.*

Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study.
Client: Seminole Tribe of Florida.
Location: Hendry County, Florida. Role*: Project Manager.*

CREDENTIALS/ORGANIZATIONS

- FWC Land Management Review
- Wetland Assessment Procedure Training
- Florida Native Plant Society
- Certified Archeological Monitor, Florida Bureau of Archeological Research
- FWC Authorized Gopher Tortoise Agent
- FWC Gopher Tortoise Line Transect Distance Sampling Workshop
- Boating Safety Course
- FWC Boating Course and Airboat Operator's Safety and Operation Certification
- PADI Open Water SCUBA Certified
- CPR/First Aid Certified (March 2023)

SKILLS

- Environmental Planning and Monitoring
- GIS Mapping
- Terrestrial and Wetland Biology
- Protected Species Surveys
- Plant Taxonomy
- Natural Community Mapping
- Wildlife Management Plans
- Data Management and Statistical Analysis
- Radio Telemetry monitoring of wildlife

EDUCATION

- PhD, Systems Ecology, Department of Environmental Engineering, University of Florida
- MS, Wildlife Ecology and Conservation, University of Florida
- BS, Wildlife Ecology, University of Wisconsin-Madison

YEARS OF EXPERIENCE

- Water & Air: 4
- Other Firms: 29

CONTACT

- jsurdick@waterandair.com

MARK K. MCMANUS

STAFF GIS ANALYST

Ecological Analysis and Tree Inventory Role: GIS Analyst

Mark has professional experience in all phases of AutoCAD drafting and mapping, including natural resource mapping, air and water pollutant dispersion, planning and ecological studies, civil engineering, cultural resources, environmental assessments, and geological studies. While with Water & Air, he has portrayed data for every type of project including the preparation of CAD drawings and/or GIS mapping for ecological evaluations, habitat management plans, land use mapping projects, compatible use zone studies, and planning studies. He also prepares CAD drawings and site plans. Mark has environmental field experience including GIS/GPS data collection, field measurements, surveys, and walkovers. He is skilled in the integration of GPS and GIS Data into AutoCAD Maps and the extraction of data from AutoCAD drawings for use with computer modeling programs, such as Surfer. His previous experience included preparation of engineering drawings for permitting, planning, and construction for a wide range of water, wastewater, stormwater, environmental, and coastal projects that included: site analysis and earthwork calculations, landfill permitting, and design, and beach restoration and offshore sand borrow sites.

SELECTED PROJECT EXPERIENCE

Ecological Monitoring and Environment Assessment of a 130-square mile Study Area.
Client: Tampa Bay Water.
Location: Hillsborough, Pinellas, and Pasco Counties, Florida. *Role: GIS/CADD Specialist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting.
Client: Yellow Jacket RV Resort.
Location: Dixie County, Florida. *Role: GIS/CADD Specialist.*

Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study
Client: The Seminole Tribe of Florida.
Location: Hendry County, Florida. Role: *GIS/CADD Specialist.*

Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I.
Client: Housing Trust Group LLC
Location: Alachua County, Florida. Role*: GIS/CADD Specialist.*

CREDENTIALS/ORGANIZATIONS

- AutoCAD Training, Santa Fe Community College
- Member AutoCAD Users Group International

SKILLS

- AutoCAD 2016
- AutoCAD Map 3D 2016
- AutoCAD Civil 3D 2016
- AutoCAD Raster Design 2016
- GPS Data Collection
- Bathymetric Survey Data Mapping
- Coastal and Ocean Design
- Landfill Permitting and Design
- Golden Software Surfer Surface Mapping System
- Natural Resource Mapping
- Groundwater Contour Mapping
- ArcMap GIS
- Impaired Water Plans
- Site Analysis and Earthwork Volume Calculations

EDUCATION

- AS, Drafting & Design Technology, Santa Fe College

YEARS OF EXPERIENCE

- Water & Air: 13
- Other Firms: 18

CONTACT

- mmcmanus@waterandair.com

Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River Update.
Client: Southwest Florida Water Management District.
Location: Levy and Citrus Counties, Florida.
Role*: GIS/CADD Specialist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site.
Client: Tampa Bay Water.
Location: Escambia County, Florida.
Role*: GIS/CADD Specialist.*

Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir.
Client: Arcadis (Prime for Client Tampa Bay Water).
Location: Hillsborough County, Florida. Role*: GIS/CADD Specialist.*

Tampa Bay Water Building Landscape (As-Needed Services Contract).
Client: Tampa Bay Water
Location: Clearwater, Florida. Role: *Project Scientist.*

PETER W. NESMITH, PWS

Senior Scientist

Ecological Analysis and Tree Inventory Role: Project Manager

Peter is a botanist with experience in identifying and characterizing native vegetation of the southeastern United States. His experience includes plant identification, vegetation community identification and mapping, native plant propagation, cultivation, and use in ecosystem restoration and enhancement, and ecological assessments (identifying vegetative response to natural and human induced factors) utilizing quantitative vegetation data. Peter has served as the field botanist and project manager for projects involving quantitative vegetative and hydrologic monitoring to determine changes in cypress dome systems in response to climate, land use, and surface water alterations, and wellfield production for public supply. Other project work involves restoration of freshwater marsh and pine flatwoods. He has significant experience with the propagation, cultivation, planting, and management of native species. He has completed botanical surveys and vegetation community mapping, conducted numerous endangered and threatened plant species surveys, vegetation mapping projects, and wetland delineations. Peter is a Professional Wetland Scientist (Society of Wetland Scientists) and a Certified Wetland Delineator with the U.S. Army Corps of Engineers.

SELECTED PROJECT EXPERIENCE

Ecological Monitoring and Environment Assessment of a 130-square mile Study Area.
Client: Tampa Bay Water.
Location: Hillsborough, Pinellas, and Pasco Counties, Florida. Role*: Project Scientist.*

Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study.
Client: Seminole Tribe of Florida.
Location: Hendry County, Florida. Role: *Project Scientist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site.
Client: Tampa Bay Water.
Location: Escambia County, Florida. Role*: Project Manager.*

CREDENTIALS/ORGANIZATIONS

- Professional Wetland Scientist
- Society of Wetland Scientists
- Society for Ecological Restoration
- SWFWMD Wetland Assessment Procedure
- DEP Lake Vegetation Index Certification
- Florida Native Plant Society
- U.S. Army Corps of Engineers Certified Wetland Delineator
- CPR/First Aid Certified (March 2023)

SKILLS

- Ecological Restoration and Mitigation
- Environmental Monitoring and Monitoring Plans
- Management Plans: Restoration, Fire, Exotic/Nuisance Species
- Vegetation Community Mapping
- Aerial Photo Interpretation
- Protected Plant and Animal Species Surveys
- Terrestrial/Aquatic Biology/Botany
- Data Management and Analysis

EDUCATION

- BS, Botany, University of Florida

YEARS OF EXPERIENCE

- Water & Air: 33
- Other Firms: 2

CONTACT

- pnesmith@waterandair.com

Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir.
Client: Arcadis (Prime for Client Tampa Bay Water).
Location: Hillsborough County, Florida. Role*: Project Manager.*

Florida Native Species Planting for Florida Department of Environmental Protection Environmental Resource Permitting.
Client: City of Gainesville Utilities Department.
Location: Alachua County Florida. Role*: Project Manager.*

SKY K. NOTESTEIN

Senior Scientist

Ecological Analysis and Tree Inventory Role: Project Scientist/Quality Assurance Officer

Sky has approximately 22 years of environmental sciences experience working for state government and private firms. He has demonstrated experience in lab and personnel management, project management, aquatic, wetland, and terrestrial ecology, natural resource restoration, and water use permitting. He has worked throughout Florida in springs, streams, lakes, wetlands, and estuaries with particular experience along the Springs Coast and Big Bend Region of Florida. Sky has experience in wetland assessment, wetland delineations, terrestrial and aquatic biological species assessments, environmental assessment, and monitoring. He has worked on environmental projects throughout the state of Florida, including residential developments, water utilities, and restoration projects. He is familiar with the permitting process for Florida water management districts, Florida Department of Environmental Protection, and U.S. Army Corps of Engineers. He is proficient in the monitoring of aquatic, wetland, and terrestrial flora and fauna with particular expertise in submerged aquatic vegetation ecology. He is proficient in computer use for data management, statistical analysis, graphical presentations, and report creation. He is experienced with a variety of environmental and water chemistry instrumentation.

SELECTED PROJECT EXPERIENCE

Kings Bay Vegetation Evaluation.
Client: Southwest Florida Water Management District.
Location: Citrus County, Florida. Role*: Project Manager.*

Mapping and Monitoring Submerged Aquatic Vegetation in Ichetucknee Springs.
Client: Suwannee River Water Management District.
Location: Columbia County, Florida. Role*: Project Manager.*

CREDENTIALS/ORGANIZATIONS

- Open Water Diver (PADI)
- Advanced Open Water Diver (IDEA)
- Rescue Diver (IDEA)
- Nitrox Diver (IDEA)
- Emergency Oxygen Provider (PADI)
- First Aid/CPR/AED Certified (August 2022)
- Bloodborne Pathogen Certified
- FWC Boating Safety Course
- Florida Department of Environmental Protection Water Sampling and Meter Testing

SKILLS

- Marine, Estuarine, and Freshwater Biology
- Stream, Wetland, and Springs Ecology
- Fisheries and Wildlife Monitoring
- Submerged Aquatic Vegetation Surveys
- Wetland Delineation
- Natural System Restoration
- Water Quality and Chemistry Analysis
- Surface Water Improvement and Management Plans
- Water Supply Planning
- Minimum Flows and Levels Analysis
- Project and Contract Management
- Stakeholder Outreach and Communication

EDUCATION

- MS, Estuarine Ecology, University of Florida
- BS, Wildlife Ecology and Conservation, University of Florida

YEARS OF EXPERIENCE

- Water & Air: 1
- Other Firms: 21

CONTACT

- snotestein@waterandair.com

TYLER B. LESLIE

Scientist II

Ecological Analysis and Tree Inventory Role: Project Scientist

Tyler is a biological scientist who has worked in environmental consulting field in Florida since 2005. He has experience working in both terrestrial and aquatic systems. His terrestrial system experience includes biological site evaluations, exotic and invasive plant control, vegetation monitoring, groundwater sampling and monitoring, and gopher tortoise surveys and removal. In both fresh and saltwater aquatic systems, his experience includes water quality sampling, wetland monitoring, macroinvertebrate collection and identification, vegetation surveys, and fish and wildlife data collection. Tyler has managed several projects and prepared numerous technical reports, including tables and CAD figures. He has also conducted well installations and supervised petroleum contamination removal. Tyler communicates with various Florida Department of Environmental Protection managers and property owners. Prior to his employment with Water & Air, Tyler performed various biological assessments, wetlands surveys, and water sampling.

SELECTED PROJECT EXPERIENCE

Housing Trust Group LLC Listed Species and Tree Surveys, Wetland Delineation, and Phase I.
Client: Housing Trust Group LLC.
Location: Alachua County, Florida. Role*: Project Scientist.*

Shoreline Vegetation Assessment and Mapping of the Lower Withlacoochee River Update.
Client: Southwest Florida Water Management District.
Location: Levy and Citrus, Florida. Role*: Project Scientist.*

Wetland Forest Inventory, Aerial Analysis, Monitoring and Sentinel Species Diversity Study.
Client: Seminole Tribe of Florida.
Location: Hendry County, Florida. Role*: Project Scientist.*

CREDENTIALS/ORGANIZATIONS

- Florida Department of Environmental Protection Stream Condition Index Certification
- FDACS Licensed Aquatic and Natural Areas Herbicide Applicator # CM255551, Categories 21,5A
- Emergency Oxygen Provider Certified
- Florida Keys National Marine Sanctuary Boater Education Course (October 2020)
- FWC Authorized Gopher Tortoise Agent
- Wetland Assessment Procedure training, Southwest Florida Water Management District
- Boating Safety Course
- Everglades National Park Boater Certified (October 2020)
- CPR/First Aid Certified (March 2023)
- PADI Open Water SCUBA Certified

SKILLS

- Exotic/Invasive Vegetation Survey/Control
- Macroinvertebrate Taxonomy and Collection
- Wetland Assessment Procedure Training
- Gopher Tortoise Services (Authorized Agent)
- Surface and Groundwater Sampling
- AutoCAD
- Stream Condition Index
- Water Quality and Wetland Mitigation Monitoring
- Vegetation Surveys
- Endangered and Threatened Species Surveys
- Contamination Assessment and Reports
- Water Quality Readings
- ArcGIS

EDUCATION

- BS, Zoology, University of Florida
- AA, Santa Fe College

YEARS OF EXPERIENCE

- Water & Air: 16
- Other Firms: 2

CONTACT

- tleslie@waterandair.com

Ecological Monitoring and Environment Assessment of a 130-square mile Study Area, Tampa Bay Water.
Client: Tampa Bay Water.
Location: Hillsborough, Pinellas, and Pasco Counties, Florida. Role*: Project Scientist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting.
Client: Yellow Jacket RV Resort.
Location: Dixie County, Florida. Role*: Project Scientist.*

Tree, Listed Species, and Ecological Surveys for Environmental Resource Permitting for a proposed Cell Phone Tower Site.
Client: Tampa Bay Water.
Location: Escambia County, Florida. Role*: Project Scientist.*

Environmental Monitoring and Multispectral Remote Sensing Analysis of the Chito Branch Preserve at the Tampa Bay Regional Reservoir.
Client: Arcadis (Prime for Client Tampa Bay Water).
Location: Hillsborough County, Florida. Role*: Project Scientist.*

BRIAN G. ORMISTON, Ph.D.

SENIOR ECOLOGIST

APPLIED ECOLOGY, REMOTE SENSING & GIS

1606 Huntington Lane, Safety Harbor, FL 34695

Telephone: 727-796-7924, 727-510-7055 (cell)

Email: bgormiston@gmail.com

AREAS OF SPECIALIZATION

Ecology; Environmental Remote Sensing/Aerial Photointerpretation and Geographic Information Systems; Environmental Impact Assessment; Environmental Monitoring and Management.

EDUCATION

Ph.D., Ecology, **1983** SUNY Stony Brook, New York (US Dept. Energy and American Museum of Nat. History Research Fellowships; and Graduate Teaching Assistant)

B.S., Biology, **1975** Biology Honors, University of Miami, Florida (Minor in Chemistry, Emphasis in Ecology with research in Everglades National Park)

PROFESSIONAL AFFILIATIONS, CERTIFICATIONS AND CONTINUING EDUCATION

- Ecological Society of America (1987)
- American Society for Photogrammetry and Remote Sensing (1995) #29557
- USFWS National Wetland Inventory (NWI) Mapping Wetland Classification (1987) Certified; also certified in Habitat Evaluation Procedures
- FAA Certified Airplane Pilot (ASEL, Instrument Rating, 1992) Remote Sensing Experience, Flight Status: Current and Qualified
- FAA Certified Commercial UAV Pilot (Part 107 Commercial Drone Pilot, 2021)
- Southwest Florida Water Management District Wetland Assessment Procedure and Plant Identification Training (2005 and 2006)
- Continuing Education in Remote Sensing and Satellite Imagery, Space Imaging Inc. (former Authorized Reseller for Space Imaging Inc.)

EXPERIENCE SUMMARY

Dr. Brian Ormiston is a broadly trained ecologist and environmental scientist with over 40 years of experience in ecology, including *35 years of field and aerial imagery and remote sensing experience throughout Florida. He is a recognized expert in remote sensing for environmental assessment, mapping and management*, and has testified as an expert witness in ecology, remote sensing, and statistical analysis on behalf of State of Florida Water Management Districts, Tampa Bay Water, and other organizations. Over 50 remote sensing/GIS projects were completed in upland, wetland and coastal marine settings, involving vegetation mapping and species inventory, classification and change analyses, hyperspectral mapping of exotic and native species, and soil moisture and leaf water content index mapping for environmental management. Since 1987, Dr. Ormiston has conducted aerial photointerpretation for land cover and use mapping of wetlands and uplands, as well as digital analysis of vegetation and hydration of wetlands for state and federal lands, and the analysis of impacts of water level changes on wetland and upland ecosystems. He has evaluated restoration efforts and recovery of ecosystems using remote sensing including exotic vegetation removal programs. Dr. Ormiston has experience in the use of GIS for environmental mapping, management and decision processes including monitoring program designs and land use and management involving forestry, protected species habitat and wetland areas.

Dr. Ormiston has provided technical services including *spectral library development and digital image tree canopy classifications for six cities in MS and AL covering over 600 sq. mi. of area* imaged by AISA Eagle hyperspectral imagery and LiDAR collected by Galileo Group Inc. During

his career he has provided professional ecological, statistical and remote sensing services to numerous environmental agencies and organizations including SWFWMD, SJRWMD, the Florida Natural Areas Inventory, the Florida Division of Aquaculture, NASA/KSC, West Coast Inland Navigation District, FDOT, USGS, Manatee County, Tampa Bay Water, and numerous environmental firms and organizations.

SPECIALIZED SOFTWARE EXPERTISE

Remote Sensing- **ENVI (user since 1998)**. Highly proficient in use of ENVI for: georegistration; data calibration, corrections and enhancement; image normalization methods; image mosaicing and fusion; automated and supervised digital classification and accuracy assessment; digital change detection methods; hyperspectral data analysis, target detection and mapping with an emphasis on invasive exotic species, tree canopy loss and species mapping, and submerged and emergent aquatic vegetation mapping.

Remote Sensing- European Space Agency SNAP image Processing Software (2021)

GIS- **ESRI software user since 1989**. ArcView, ArcMap, spatial analyst and geostatistical analyst extensions, ArcPad. Proficient in use of ArcMap software, map algebra/spatial operations, and geostatisical modeling; suitability analyses. Also, QGIS 3.18 GIS open source software.

SELECT RELEVANT PROJECT EXPERIENCE, REMOTE SENSING

Project VERANDA, Galileo Group, Inc., Hyperspectral Data Analyst, Tree Class Mapping in Mississippi and Alabama—Provided technical services including spectral library development and digital image classifications for six cities in MS and AL covering over 600 sq. mi. of area imaged by AISA Eagle hyperspectral imagery and LiDAR. Evaluated SAM and Maximum Likelihood (ML) Classification methods and applied ML to achieve a species target level of accuracy 90% or better. Project completed on time within an extremely short (2-month) performance window. (Completed Oct. 15, 2019).

Environmental Monitoring – Aerial Photography Program- Tampa Bay Water— Dr. Ormiston was instrumental in facilitating Tampa Bay Water's transition from film-based aerial photography to multispectral satellite and airborne digital imagery and has assisted with scope development for vendor selection and evaluation of vendor image quality during project performance periods. The area imaged is over 1,100 sq. miles and encompasses major portions of Hillsborough, Pinellas, Pasco and Hernando counties. He performed numerous studies with high spatial resolution airborne hyperspectral imagery (AISA and CASI) and satellite imagery (Ikonos-2) at the Model Dairy and Regional Reservoir Mitigation Site Areas, Salt Springs Park Mitigation Area, and Starkey Wellfield for Tampa Bay Water; and has provided Ikonos-2 imagery and IRS1C satellite imagery for Tampa Bay Water as well as imaging processing services.

Environmental Monitoring of Tampa Bay Regional Reservoir, Tampa Bay Water— Subcontractor to Arcadis Inc., HDR Engineering/CH2M Hill/Golder Assocs. Environmental monitoring was conducted from 2001 – 2020 to assure that operation of the region's surface water reservoir does not adversely affect surrounding forested wetland communities due to leakance of stored reservoir water from the facility. Responsible for image processing, radiometric calibration, mosaicing and analysis of true multispectral high resolution Ikonos satellite imagery and ADS40/100 digital multispectral camera imagery including NDVI vegetation change detection products and implementation of results in GIS. Assisted project manager and hydrologist with remote sensing report preparation, analysis of wetland transect surface water and groundwater data, and quality assurance tasks. Provided georegistered, radiometrically calibrated digital aerial imagery of the reservoir area in spring and fall of each year. (2002-2020)

Remote Sensing and Mapping of Brazilian Pepper at the Werner-Boyce Salt Springs

State Park, Port Richey, Florida with Hyperspectral Airborne (AISA) Imagery, Tampa Bay Water, Clearwater, Florida and PBS&J, Tampa, Florida—Brazilian Pepper was mapped in 2005, 2007, 2008 and 2009 using spectral analysis methods and AISA 128-band hyperspectral imagery in ecosystems at this Coastal State Park. Collected ground spectral samples of vegetation species and cover types throughout study sites using an ASD FieldSpec Pro VNIR spectrometer and created spectral libraries using ENVI. Prepared georegistered mosaics of imagery, processed imagery to reflectance, and performed spectral angle mapper analyses and ground-truthing. Accuracy assessments indicated better than 95% accuracy in identifying the locations of Brazilian Pepper, with individual plants as small as 1 m in diameter being detected.

Historical Aerial Photo Georegistration and Mosaicking, Wildlife Management Areas and State Forests, Florida National Areas Inventory (FNAI), Florida State Univ., Tallahassee, Florida—Provided georectification and mosaicing services for hundreds of 1:20,000 scale historical (1940s and 1950s) scanned panchromatic aerial photographs for nearly all of the state wildlife management areas in North, Central and South Florida. Created digital geotiff image mosaics at 1 m resolution for FNAI's use in assessing historical land cover and provided individual frames in geotiff format.

US Army COE, "The Pocket" Everglades Study Area CASI Image Vegetation Mapping, Water and Air Research, Gainesville, Florida—As a subcontractor to Water and Air, provided compact airborne spectrographic imager (CASI) hyperspectral remote sensing survey imagery and analytic mapping services for a Dec. 2000 baseline vegetation mapping survey of natural and exotic plant species located in a remote area of the Florida Everglades. Performed image georegistration and mosaicking of multiband (14 channel) 1m and .5 m resolution imagery and digital image classification using ENVI 3.4 image processing software with unsupervised and supervised maximum likelihood classification algorithms.

EXPERT TESTIMONY EXPERIENCE INVOLVING PHOTOINTERPRETATION

Expert Services and Expert Witness Testimony, Bay County Wellfield Impacts, Knight Family Trust and Washington Co., Doug Manson Esq., Manson Law Group--Brian G. Ormiston Ph.D. provided expert review and testimony services in Ecology as part of a multidisciplinary team of environmental experts to challenge the issuance of a CUP by the Northwest Florida Water Management District to Bay County for a proposed 30 MGD wellfield located on the border between Bay and Washington Co. in the Florida Panhandle. Work included field reviews of wetlands, listed plants and animals on 80 square miles of pristine property with steephead ravines, oligotrophic lakes, and seepage wetlands underlain by Karst geology owned by the Knight Family Trust; aerial helicopter survey of habitats; review of historical aerial photographs; report preparation of findings concerning potential for impacts and deficiencies in the permit required environmental monitoring plan; assisting with the depositions of opposing experts; and actual testimony at the DOAH hearing in Tallahassee. The Hearing Officer ruled in favor of our team and Washington Co and recommended denial of the wellfield permit. (2011-12).

Lewis, Longman & Walker, P.A., Photointerpretation of Parcels on Barrier Island at Anna Maria Island, Bradenton, Florida—Assisted LLW attorney Kevin Hennessey with photointerpretive review of historical and modern aerial photographs and GIS mapping of natural community cover types for a private property owner disputing a Florida Dept. of Environmental Protection (FDEP) permit decision. Admitted as an expert witness in aerial photointerpretation, digital image processing and analysis, and coastal ecology of wetland and upland plant communities. Provided expert witness testimony before an Administrative Hearing Officer in Photointerpretation and Coastal Ecology.

Kelly McPherson
1716 SE 64th Way, Gainesville, FL 32641
(352)727-8347
E-mail: workpherson@cox.net

EDUCATION/CERTIFICATIONS

2021	ISA Tree Risk Assessment Qualification
2019	ISA Certified Arborist FL-9575A
1997	M.S., Department of Botany (Plant Ecology), University of Florida
1993	B.S., School of Forest Resources and Conservation, University of Florida
1989	A.S., University of North Florida

EXPERIENCE

September 2017 – Present	**Arborist/Administrator,** Workman Forestry, LLC. Sales, business administration.
December 2005 – 2017	**Sr. Environmental Specialist,** Alachua County, Environmental Protection Department, Land Conservation Division. Preserve manager, capital improvements project manager, contracts management and oversight, land acquisition team, division GIS coordinator.
December 2003 – December 2005	**OPS Biologist,** Florida Natural Areas Inventory. GIS mapping, rare species.
1997- 2003	**Environmental Specialist II,** Florida DEP, Division of Recreation and Parks, District 2, Gainesville, Florida. District biologist, management planning and implementation, contractor oversight, GIS mapping, budget management, leveraging funding, invasive plant control staff oversight.
1994- 1997	**Laboratory Instructor,** Departments of Biological Sciences and Botany, University of Florida. General Biology, General Botany, Introduction to Ecology, and Plant Physiological Ecology.
1995 -1996 Summers	**Research Assistant,** Coastal Forest Decline Project, Department of Botany, University of Florida. Vegetation census, soil redox potential measurements, data analysis.
1995 - 1996	**Research Assistant, Impact of Clear-cutting on Animal Populations in Cypress Ponds** Department of Forestry, University of Florida**.** Bird surveys.
1993 - 1994	**Project Manager, Fire Effects Monitoring Project**, Tall Timbers Research Station, and the U.S. Department of Interior.
1993	**Research Assistant, Southeastern American Kestrel Program**, Department of Wildlife Conservation, University of Florida.

RELEVANT PROJECT

Annual Tree Assessment. Madison Square Condominium Complex. Conduct Level 1 and Level 2 assessments to determine risk and prioritize tree care needs.

PUBLICATIONS

McPherson, K. and K. Williams. 1998. The role of carbohydrate reserves in the growth, resilience and persistence of cabbage palm seedlings (*Sabal palmetto*). Oecologia 117:460-468.

McPherson, K. and K. Williams. 1998. Fire resistance of cabbage palms (*Sabal palmetto*) in the southeastern USA. Forest Ecology and Management 109: 197-207.

McPherson, K. 1997. Effects of Fire and Defoliation on Cabbage Palm (*Sabal palmetto*). M.S. Thesis, University of Florida.

McPherson, K. and K. Williams. 1996. Establishment growth of cabbage palm, *Sabal palmetto* (Arecaceae). American Journal of Botany 83:1566-1570.

Erick D. Smith
Forest Ecologist
P.O. Box 12417
Gainesville, FL 32604
(352) 380-0648 erick@kestreleco.com

Education: B.S. Department of Forestry, University of Florida, 1992.
ISA Certified Professional Arborist FL-5376A
Licensed Commercial Pesticide Applicator in Natural Areas
Weed Management and Aquatic CM23608

Work Experience:

August 2007 – current Owner and Ecologist
Kestrel Ecological Services, LLC
Perform arborist consulting for residential and commercial clients. Provide invasive/exotic plant surveys & control, wetland and pond maintenance, native plant restoration contracting, ecological monitoring and biological inventories.

January 2007 – December 2007 Research Project Manager
University of Florida, School of Forest Resources and Conservation, USFS Wildland Urban Interface Center
Primary responsibility was design and implementation of a residential landscaping fire behavior experiment at the UF Ordway Swisher Biological Station.

March 2001 – January 2007 Urban Forester
University of Florida Physical Plant Division
Primary responsibility was maintaining the health of all trees on 2,000+ acres in the urban landscape and conservation areas of the University of Florida Gainesville campus. Duties included: development review of all construction projects minor and major on the main UF campus; review of all tree removals; monitoring and inspection of construction projects for compliance with approved site plans; ongoing campus tree inventory; exotic invasive plant control and monitoring; and coordinating the planting of new trees.

May 2000 – December 2000 Exotic Invasive Removal Technician
Florida State Parks District II
Primary responsibility was travelling to all District II parks and treating EPPC Category I & II plants with the most current and effective herbicides. Also gave classes and seminars on exotic invasive plant control to state park employees.

October 1997- February 2001 Forester, Urban Forestry Services
Primary responsibility was assistance with a sixty plus specie native plant nursery. Seed collection, preparation, and sowing were the major tasks. Forestry consulting jobs included tree surveys, hazard tree evaluation, exotic invasive plant control, and site plan monitoring.

References available upon request.

DRUG-FREE WORKPLACE FORM

The undersigned bidder in accordance with Florida Statute 287.087 hereby certifies that

Water & Air Research, Inc. does:

(Name of Bidder)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for the drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this bidder complies fully with the above requirements.

Bidder's Signature

06/27/2023

Date

In the event of a tie bid, bidders with a Drug Free Workplace Program will be given preference. To be considered for the preference, this document must be completed and uploaded to DemandStar.com with your Submittal.

BIDDER VERIFICATION FORM

LOCAL PREFERENCE (Check one)
Local Preference requested: ■ YES ☐ NO

A copy of your ***Business Tax Receipt*** must be included in your submission if you are requesting Local Preference:

QUALIFIED SMALL BUSINESS AND/OR SERVICE DISABLED VETERAN BUSINESS STATUS (Check one)
Is your business qualified, in accordance with the City of Gainesville's Small Business Procurement Program, as a local Small Business? ■ YES ☐ NO

Is your business qualified, in accordance with the City of Gainesville's Small Business Procurement Program, as a local Service-Disabled Veteran Business? ☐ YES ■ NO

REGISTERED TO DO BUSINESS IN THE STATE OF FLORIDA
Is Bidder registered with Florida Department of State's, Division of Corporations, to do business in the State of Florida?
■ YES ☐ NO (refer to Part 1, 1.6, last paragraph)

If the answer is "YES", provide a copy of SunBiz registration or SunBiz Document Number (# 365851)

If the answer is "NO", please state reason why: _____

_____

_____

Water & Air Research, Inc.
Bidder's Name

Barry L. Vance; President and CEO
Printed Name/Title of Authorized Representative

Signature of Authorized Representative — Date: 06/27/2023

This page must be completed and uploaded to DemandStar.com with your Submittal.

Water & Air Research, Inc. does not take any exceptions to the of the terms of this RFP.

Water & Air Research, Inc. has a certified arborist, Ms. Kelly McPherson, on our project team, which demonstrates our ability to satisfy the minimum qualification requirement. Ms. McPherson's arborist certification follows this page.

The International Society of Arboriculture

Hereby Announces That

Kelly McPherson

Has Earned the Credential

ISA Certified Arborist ®

By successfully meeting ISA Certified Arborist certification requirements through demonstrated attainment of relevant competencies as supported by the ISA Credentialing Council

Caitlyn Pollihan
CEO & Executive Director

2 December 2019	31 December 2025	FL-9575A
Issue Date	Expiration Date	Certification Number

ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17024
PERSONNEL CERTIFICATION BODY
#0847
ISA Certified Arborist

REFERENCE FORM

Name of Bidder: Water & Air Research, Inc.

Provide information for three references of similar scope performed within the past 3 years. You may include photos or other pertinent information.

#1 Year(s) services provided (i.e. 1/2015 to 12/2018): 10/2019 to 10/2020

Company Name: Tampa Bay Water
Address: 2575 Enterprise Road
City, State Zip: Clearwater, Florida 33763
Contact Name: Doug Keesecker
Phone Number: 727-791-2348 Fax Number: 727-791-2388
Email Address (if available): DKeesecker@tampabaywater.org

#2 Year(s) services provided (i.e. 1/2015 to 12/2018): 8/2020 to 11/2020

Company Name: Housing Trust Group LLC (HTG)
Address: 3225 Aviation avenue, 6th Floor
City, State Zip: Coconut Grove, Florida 33133
Contact Name: Mr. Jordan Finkelman
Phone Number: 305-860-8188 Fax Number: N/A
Email Address (if available): jordanf@htgf.com

#3 Year(s) services provided (i.e. 1/2015 to 12/2018): 02/2022 to 09/2022

Company Name: Seminole Tribe of Florida
Address: 650 Harney Pond Road, NE, Room #108J
City, State Zip: Okeechobee, Florida 34974
Contact Name: Ms. Karli Eckel
Phone Number: 863-763-4128 Fax Number: N/A
Email Address (if available): karlieckel@semtribe.com

This page must be completed and uploaded to DemandStar.com with your Submittal.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 03/20/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER		CONTACT NAME:	Wendy Tyree	
Lassiter-Ware Insurance		PHONE (A/C, No, Ext):	(800) 845-8437	FAX (A/C, No): (888) 883-8680
1300 N. Westshore Blvd.		E-MAIL ADDRESS:	wendyt@lassiterware.com	
Suite 110		INSURER(S) AFFORDING COVERAGE		NAIC #
Tampa	FL 33607	INSURER A :	Certain Underwriters at Lloyd's of London	085202
INSURED		INSURER B :	Travelers Property Casualty Company of America	25674
Water and Air Research, Inc.		INSURER C :	The Phoenix Insurance Company	25623
6821 SW Archer Road		INSURER D :		
		INSURER E :		
Gainesville	FL 32608	INSURER F :		

COVERAGES **CERTIFICATE NUMBER:** 22-23 Cert **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR [X] Contractors Pollution Liability [ ] GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:			ENC0007592-01	07/01/2022	07/01/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG 	$ 1,000,000 $ 50,000 $ 10,000 $ 1,000,000 $ 2,000,000 $ 2,000,000 $
B	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [X] HIRED AUTOS ONLY [X] NON-OWNED AUTOS ONLY			BA9P9821712247G	07/01/2022	07/01/2023	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) PIP-Basic	$ 1,000,000 $ $ $ $ 10,000
A	[ ] UMBRELLA LIAB [X] OCCUR [X] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			ENX0007593-01	07/01/2022	07/01/2023	EACH OCCURRENCE AGGREGATE 	$ 3,000,000 $ 3,000,000 $
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y / N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		UB7K0916612247V	07/01/2022	07/01/2023	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
A	Professional Liability (Claims-Made) Limits included with General Liability			ENC0007592-01	07/01/2022	07/01/2023	Each Claim Aggregate	$1,000,000 $2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Maritime Employers Liability / USL&H – Policy #B5JH27691 – Atlantic Specialty Insurance Company (NAIC #27154) – Effective 07/01/2022 – 07/01/2023 – Limits: Any one accident $1,000,000 / Any one person-accident $1,000,000 – Deductible $5,000

CERTIFICATE HOLDER

~Evidence of Insurance
c/o Water & Air Research, Inc.
6821 SW Archer Road
Gainesville FL 32608

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Patricia Kane Sobnosky

Certification: View

Help & Tools

Certification List | View Letters & Certificates | Add Date Alert

Vendor Information

BUSINESS NAME	**WATER & AIR RESEARCH, INC**
SYSTEM VENDOR NUMBER	**20708133**
PRIMARY OWNER'S NAME	**Bryan B. McDonald /Teresa Collins Ayres**
ETHNIC GROUP	**Caucasian**
GENDER	

Certification Information

CERTIFYING AGENCY	**City of Gainesville**
CERTIFICATION TYPE	**SBE - Small Business Enterprise**
EFFECTIVE DATE	**6/23/2023**
RENEWAL DATE	**6/23/2025**

Contact Information

MAIN COMPANY EMAIL	**tcollins@waterandair.com**
MAIN PHONE	**352-372-1500 Ext. 106**
MAIN FAX	**352-378-1500**

Addresses

PHYSICAL ADDRESS	**6821 SW ARCHER ROAD** **GAINESVILLE, FL 32608 [map]**
MAILING ADDRESS	**6821 SW ARCHER ROAD** **GAINESVILLE, FL 32608 [map]**

Business Capabilities

BUSINESS CERTIFIED FOR		
FULL DESCRIPTION OF CAPABILITIES/PRODUCTS		
COMMODITY CODES	**NIGP 91843**	**Environmental Consulting**

NIGP 91855	**Geological Consulting**
NIGP 91872	**Lakes, Rivers, and Other Waterway Management Consulting**
NIGP 91873	**Landscaping Consulting**
NIGP 92500	**ENGINEERING SERVICES, PROFESSIONAL**
NIGP 92535	**Environmental Engineering**
NIGP 92540	**Fisheries; Fish Ladders Engineering**
NIGP 92545	**Geological Engineering**
NIGP 92548	**Harbors, Jetties. Piers, Docks, Marinas, Ship Terminal Facilities Engineering**
NIGP 92551	**Hazardous Waste Engineering Services, Including Remedial Investigations and Feasibility Studies for Waste Sites**
NIGP 92575	**Petroleum And Fuel (Storage And Distribution)/Engineering**
NIGP 92577	**Pollution Control Engineering**
NIGP 92596	**Waste Water Treatment Engineering**
NIGP 92597	**Water Supply, Treatment, and Distribution Engineering**
NIGP 92600	**ENVIRONMENTAL AND ECOLOGICAL SERVICES**
NIGP 92614	**Air Pollution Control Services, Including Data Collection Research and Development, etc.**
NIGP 92615	**Air Quality Monitoring Services**
NIGP 92629	**Contaminated Groundwater Services, Including Discharge Pipe Installation**
NIGP 92630	**Contaminated Soil Services**
NIGP 92640	**Ecological Services**
NIGP 92641	**Ecosystems Development, Management and Protection Services**
NIGP 92642	**Environmental Services (Not Otherwise Classified)**
NIGP 92649	**Hydraulic Push Probe, Geoprobe Services**
NIGP 92652	**Impact Studies, Environmental**
NIGP 92658	**Lead and Asbestos Inspection Services**
NIGP 92662	**Noise Testing Services**
NIGP 92665	**Oil and Petroleum Spill Services, Including Removal of Used Petroleum Products**
NIGP 92666	**Oil and Water Separator Inspection and Testing Services**
NIGP 92670	**Permitting Services, Environmental**
NIGP 92672	**Planning and Advisory Services, Environmental**
NIGP 92678	**Remediation Services, Environmental, Including Rehabilitation Services Hazardous Waste and Mold Remediation**
NIGP 92682	**Safety Services, Environmental**
NIGP 92683	**Site Assessment, Environmental**
NIGP 92684	**Soil Pollution Services**
NIGP 92685	**Soil, Soil Vapor and Groundwater Sampling and Analysis, Including Disposal**
NIGP 92688	**Storm Water Discharge Testing Services**
NIGP 92690	**Subsurface Testing, Environmental**
NIGP 92691	**Tank Testing and Disposal Services, Storage, Including Underground Types**
NIGP 92693	**Testing and Monitoring Services, Air, Gas, and Water**
NIGP 92694	**Water Pollution Services**
NIGP 92695	**Water and Wastewater Conservation Services**
NIGP 92696	**Wetland Delineations, Including Assessments**
NIGP 94732	**Conservation Services, Forest**
UNSPSC 47100000	**Water and wastewater treatment supply and disposal**
UNSPSC 77000000	**Environmental Services**
UNSPSC 77101800	**Environmental auditing**

UNSPSC 77101900	**Pollution investigation services**
UNSPSC 77111600	**Environmental rehabilitation**
UNSPSC 77121600	**Soil pollution**
UNSPSC 81100000	**Professional engineering services**
UNSPSC 81150000	**Earth science services**

Owner Ethnicity and Gender

ETHNIC GROUP	**Caucasian**
GENDER	

Location

COUNTY	**Alachua (FL)**

Letters & Certificates

View	Letter Type	Format	Date Sent	Viewed

Certification List

2023 FLORIDA PROFIT CORPORATION ANNUAL REPORT

FILED
Apr 07, 2023
Secretary of State
3145287022CC

DOCUMENT# 365851

Entity Name: WATER AND AIR RESEARCH INCORPORATED

Current Principal Place of Business:

6821 S.W. ARCHER ROAD
GAINESVILLE, FL 32608

Current Mailing Address:

6821 S.W. ARCHER ROAD
GAINESVILLE, FL 32608 US

FEI Number: 59-1302326

Certificate of Status Desired: Yes

Name and Address of Current Registered Agent:

VANCE, BARRY L
6821 SW ARCHER ROAD
GAINESVILLE, FL 32608 US

The above named entity submits this statement for the purpose of changing its registered office or registered agent, or both, in the State of Florida.

SIGNATURE: BARRY L VANCE 04/07/2023

Electronic Signature of Registered Agent — Date

Officer/Director Detail :

Title	TREASURER
Name	CORDERY, SIMON A
Address	6821 S.W. ARCHER ROAD
City-State-Zip:	GAINESVILLE FL 32608

Title	VP, DIRECTOR
Name	AYRES, TERESA C
Address	6821 S.W. ARCHER ROAD
City-State-Zip:	GAINESVILLE FL 32608

Title	VP
Name	CUBINSKI, KEVIN R
Address	6821 S.W. ARCHER ROAD
City-State-Zip:	GAINESVILLE FL 32608

Title	SECRETARY
Name	FELLOWS, MATTHEW C.
Address	6821 SW ARCHER ROAD
City-State-Zip:	GAINESVILLE FL 32608

Title	PRESIDENT
Name	VANCE, BARRY L.
Address	6821 SW ARCHER ROAD
City-State-Zip:	GAINESVILLE FL 32608

I hereby certify that the information indicated on this report or supplemental report is true and accurate and that my electronic signature shall have the same legal effect as if made under oath; that I am an officer or director of the corporation or the receiver or trustee empowered to execute this report as required by Chapter 607, Florida Statutes; and that my name appears above, or on an attachment with all other like empowered.

SIGNATURE: TERESA C AYRES SENIOR VICE PRESIDENT 04/07/2023

Electronic Signature of Signing Officer/Director Detail — Date

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

Water and Air Research Incorporated

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☑ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

6821 SW Archer Road

6 City, state, and ZIP code

Gainesville, FL 32608

Requester's name and address (optional)

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–		–				

or

Employer identification number

5	9	–	1	3	0	2	3	2	6

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person ▶** [signature] **Date ▶** 6/2/2023

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*