CITY OF NAPLES
PURCHASING DIVISION
CITY HALL, 735 8TH STREET SOUTH
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ADDENDUM NUMBER 2

NOTIFICATION DATE:	SOLICITATION TITLE:	SOLICITATION NUMBER:	BID OPENING DATE & TIME:
03/25/2024	**Lake Restoration & Improvements Project (Lakes 8 & 9) - RFP**	**24-014**	**04/09/2024 2:00PM**

THE FOLLOWING INFORMATION IS HEREBY INCORPORATED INTO, AND MADE AN OFFICIAL PART OF THE ABOVE REFERENCED BID.

The following answers to written, submitted questions:

1. **Please see Attachment A – Feasibility Study and its appendices**

# # #

IMPORTANT MESSAGE

PLEASE ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON THE BID COVER SHEET.

ATTACHMENT A

CITY OF NAPLES

NORTH LAKE AND SOUTH LAKE FEASIBILITY STUDY FINAL REPORT

CITY OF NAPLES
STREETS AND STORMWATER DEPARTMENT
295 RIVERSIDE CIRCLE
NAPLES, FL 34102

PROJECT NO.: 600843
DATE: FEBRUARY 01, 2023

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1 INTRODUCTION

Properly functioning stormwater lakes are important for effective management of both stormwater quality and stormwater quantity. The functioning and treatment capacity of some stormwater lakes within the City of Naples (the City) has been diminished over time as a result of sediment and pollutant loadings. The City has been conducting lake restorations at stormwater lakes throughout Naples and has recently prioritized North Lake (Lake 8) and South Lake (Lake 9) for restoration (**Figure 1**). The functions of North Lake and South Lake are to store and direct stormwater into the Gulf of Mexico to mitigate flooding and reduce peak flows during rainfall events. As such, these lakes provide valuable services to the citizens of the City of Naples, particularly the residents adjacent to North and South Lakes. Citizens desire an aesthetically pleasing lake front, without nuisance algal blooms or other objectionable conditions that may result from temporary water quality variations that are inherent to the dynamic nature of stormwater lakes.

The City implemented a Stormwater Lakes Management Plan in 2012 and identified South Lake, Lois Selfon Lake, Alligator Lake (which is downstream of North Lake and South Lake), Swan Lake, and Half Moon Lake as some of the lakes with the lowest pollutant removal efficiencies. Since 2012, the City has completed or initiated lake improvement projects to improve water quality at several of these lakes, including restoration in Spring Lake (upstream of Lois Selfon Lake) and Swan Lake. In the 2019 update to the City's Stormwater Lakes Management Plan, WSP (formally Wood Environment & Infrastructure, Inc.), identified North Lake as another high priority lake for restoration.

To support the City in its aim to restore stormwater lakes within Naples, WSP is currently developing lake restoration plans and specifications for North Lake and South Lake. WSP has conducted ecological evaluations of each lake, performed sediment depth surveys, collected sediment samples for analysis, and conducted flux analysis on lake sediment samples. This report describes the results of these surveys, potential water quality improvement technologies that may be considered for lake restorations and includes information on the current modeling effort and next steps. The report also includes context for an alternatives analysis and potential project funding opportunities.

The final feasibility analysis will include assessment of whether dredging or other means of remediation are viable such as capping, augmented aeration, or other applicable technology(s). WSP will provide a matrix analysis discussing the pollutant removal efficiencies, construction impacts, conceptual cost estimates, and other applicable factors. An Interconnected Channel and Pond Routing (ICPR) model is currently being used to simulate water-surface elevations in the North and South Lakes. The hydrologic portion of the model simulates rainfall runoff hydrographs from a variety of storm events from delineated sub-basins for each lake, while the hydraulic component routes storm hydrographs through natural and constructed stormwater features to determine flood stages and peak flows resulting from specific storm events. Two scenarios will be modelled, existing conditions and proposed conditions. The proposed conditions model will make changes to culvert sizes and stage/storage areas in each lake if additional stormwater flow capacity or stormwater retention volume is needed to accomplish project goals. Estimates of the anticipated water quality benefits will be modeled with the BMP Trains model (Version 4.3.5) developed by the University of Central Florida Stormwater Academy (Wanielista, 2020).

ATTACHMENT A

Figure 1. North Lake and South Lake locations.

2 BACKGROUND

North Lake is approximately 1.76 acres and South Lake is approximately 4.35 acres in size. The Combined City Clerk Report from 2010 on the ownership of City stormwater lakes describes the lake parcel ownership as "not specified on plat", and "reserved for lake purposes". While ownership is unknown, each property owner's property line extends into the lakes. North Lake discharges into South Lake, which then discharges into Alligator Lake (Lake 10), which then discharges into the Gulf of Mexico via beach outfall 6.

The City has an easement around North Lake and maintains the vegetation on the north side, along 7th Avenue N, where there are no residential properties. The City also maintains two aerators in the lake associated with a previous project. This project utilized floating islands to improve water quality, but the islands were removed because of resident complaints. North Lake is surrounded by 11 residential properties. South Lake also has an easement around the lake which is maintained for drainage purposes. There are two private aerators that the City does not maintain or own. South Lake is surrounded by 25 residential properties with no access to the lake apart from a few narrow easements located at the inflow and outflow pipes.

North Lake receives some stormwater public drainage as well as runoff from the surrounding lakeshed, which consists of residences, commercial properties, and roadways. There are two inflow pipes to North Lake and one outflow pipe that discharges to South Lake. In addition to the outflow from North Lake, South Lake receives stormwater from the surrounding lakeshed, which consists of residences and roadways. There are three inflow pipes to South Lake and one outflow pipe that discharges to Alligator Lake.

The City of Naples was hit by Hurricane Ian in September 2022. In addition to the typical climatic variation that can result in fluctuations in stormwater lake water quality, hurricanes represent a larger impact on system variability as a result of more intense rainfall, longer inundation periods, storm surge, and urban flooding. Because Hurricane Ian hit during the data collection phase of this project, additional data is provided below on the hurricane's impact on the City of Naples and potential effects of hurricanes on nearshore areas. A brief literature review, to provide additional background on the conditions within North Lake and South Lake, is also included.

2.1 HURRICANE IAN

Hurricane Ian made landfall near Cayo Costa, a barrier island west of Fort Myers and north of Naples, on September 28, 2022, as a Category 4 Atlantic Hurricane with maximum sustained winds of 150 mph. Prior to making landfall, Hurricane Ian had maximum sustained winds of 155 mph (just short of the Category 5 classification)[1]. This storm brought record-breaking storm surge and flooding to the region. Hurricane Ian has been described as producing 1-in-1,000-year rainfall with rain accumulation well over 12 inches in a 12-to-24-hour period from Port Charlotte to Orlando according to radar estimates[2].

Hurricane Ian caused water levels to rise 6.18 feet before the tidal gauge off the coast of Naples became inoperable in the afternoon of September 28[3]. Peak tide information is still being assessed, but the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information estimates that some coastal communities may have experienced storm surge as great as 12 feet[4]. Total rainfall between September 27 and 30,

[1] NOAA National Environmental Satellite Data and Information Service, "Hurricane Ian's Path of Destruction", available at https://www.nesdis.noaa.gov/news/hurricane-ians-path-of-destruction (accessed 12/8/2022)
[2] Fritz, Angela and Miller, B. CNN. "Hurricane Ian's rainfall was a 1-in-1,000 year event for the hardest-hit parts of Florida", available at https://www.cnn.com/2022/09/29/weather/hurricane-ian-1000-year-rainfall-climate/index.html (accessed 12/8/2022)
[3] Iowa State University Environmental Mesonet, "National Weather Service Raw Text Product", available at https://mesonet.agron.iastate.edu/wx/afos/p.php?pil=PSHMFL&e=202210141556 (accessed 12/8/2022)
[4] NOAA National Centers for Environmental Information, Monthly National Climate Report for September 2022, published online October 2022, retrieved on December 8, 2022 from https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202209/supplemental/page-5.

2022 was estimated to be a maximum of 10 inches in Naples[4]. East Naples received 6.99 inches between September 26 and 29[3].

Storm surge and flooding from hurricanes can potentially cause additional sedimentation within stormwater lakes. Storm surge can cause discrete deposits in coastal lakes, enclosed lagoons, and sinkholes. Hurricanes recorded in coastal lake sedimentation are typically observed in the sediment record as coarse-grain deposits, 0.1 to 1 cm thick, with lower amounts of organic matter interstratified in organic sediment[5]. After Hurricane Harvey landed in the Houston-Galveston region in 2017, researchers analyzed its impact on the Galveston Bay Estuarine System through the changes in its sediment. The researchers saw a significant change in the estuary's bed sediment compared to its historical data. Through quantifying the sediment's physical, chemical, and biological characteristics, they showed that natural events, such as Hurricane Harvey, can affect metal concentrations and microbial communities within the estuary[6]. In addition to sediment potentially being deposited into the lakes due to the hurricane, saltwater intrusion may have also occurred as seen in the San Bernard National Wildlife Refuge, Texas, after Hurricane Harvey[7].

2.2 EXISTING DATA REVIEW SUMMARY

WSP reviewed the following reports for data and information related to North and South Lakes and the surrounding watershed:

- City of Naples 2020-2021 Annual Surface Water and Pump Station Monitoring and Analysis Report (Wood, 2022)
- City of Naples 2019 Update to the City of Naples Stormwater Lakes Management Plan (Wood, 2019)
- City of Naples 2018 Stormwater Master Plan Update (AECOM, 2018)
- City of Naples Stormwater Quality Analysis, Pollutant Loading, and Removal Efficiencies (AMEC, 2012)

Each report was reviewed with a focus on water quality data (e.g., total suspended solids [TSS], nutrients including total phosphorus [TP] and total nitrogen [TN], and bacteria).

2.2.1 CITY OF NAPLES 2020-2021 ANNUAL SURFACE WATER MONITORING REPORT (WOOD, 2022)

Between October 2020 and September 2021, Wood conducted water quality sampling at 22 stormwater lakes and three pump stations within the City of Naples. Samples were analyzed for nutrients, chlorophyll-a (chl-a), copper (Cu), and fecal indicator bacteria. Frequent water quality monitoring is important to assess changes in water quality conditions in the lakes.

Wood (2022) found that some of the highest average concentrations of nutrients, chl-a, and fecal indicator bacteria were found in sampling locations in Half Moon Lake, North Lake, South Lake, Lantern Lake, and the Port Royal Pumping station. Statistically significant increasing trends were found for fecal coliform in both North and South Lakes.

While the stormwater lakes are not subject to the Florida Department of Environmental Protection (FDEP) regulatory water quality criteria, it can be helpful to consider in-lake water quality compared to the regulatory criteria of downstream water bodies. Water quality samples from North and South Lakes frequently contain concentrations of chl-a, TN, and TP that exceeds the criteria for the Gulf of Mexico. However, as stated in Wood (2022), "Stormwater

[5] Sabatier, P, et. al. A Review of Event Deposits in Lake Sediments. *Quarternary* 2022, 5, 34. https://doi.org/10.3390/quat5030034
[6] Kiaghadi, A., et. al. Longitudinal Patterns in Sediment Type and Quality During Daily Flow Regimes and Following Natural Hazards in an Urban Estuary. University of Houston. 2022. https://d197for5662m48.cloudfront.net/documents/publicationstatus/49854/preprint_pdf/9bed10b52e00c71dc19a7be125b50848.pdf
[7] Yao, Q, et. al. Hurricane Harvey Storm Sedimentation in the San Bernard National Wildlife Refuge, Texas: Fluvial Versus Storm Surge Deposition. *Estuaries and Coasts* 2020, 43. https://doi.org/10.1007/s12237-019-00639-6

lakes are designed to receive rainfall runoff containing nutrients and other pollutants and exceedances are expected when comparing the stormwater lakes to downstream criteria which apply to more natural waterbodies that were not designed and constructed to intercept stormwater runoff from developed lands. The comparison to downstream water quality criteria is simply a comparison tool and the downstream water quality criteria do not represent target water quality conditions in stormwater lakes. Information on stormwater lake samples with exceedances of non-applicable downstream waterbody criteria is provided to assist managers on where to conduct additional study to support water quality improvement projects."

2.2.2 CITY OF NAPLES UPDATE TO THE STORMWATER LAKES MANAGEMENT PLAN (WOOD, 2019)

The 2019 Lakes Management Plan Update (LMPU) for the City of Naples summarized the water quality and sediment data for the City's stormwater lakes, the prior management plan, and included updated lake rankings and recommendations. Based on the 2019 LMPU priority rankings, North Lake was ranked as one of the lakes that should be a high priority for restoration. In a citizen survey conducted as part of the 2019 LMPU, North Lake stakeholders reported deteriorating water quality and flooding issues.

2.2.3 CITY OF NAPLES 2018 STORMWATER MASTER PLAN UPDATE (AECOM, 2018)

The 2018 update to the City of Naples Stormwater Master Plan evaluated flooding and water quality issues, described water quality and water quantity issues, and proposed stormwater improvement projects and funding opportunities for the City. North Lake and South Lake are in Basin 2, which is comprised primarily of urban land (AECOM 2018) and drains to the Gulf of Mexico. Proposed projects were not included for North Lake and South Lake. AECOM (2018) also noted that Gulf Shore Boulevard, a road within Basin 2 that experiences flooding, was to be reviewed as part of an Ocean Outfall Study.

A public survey included in this study found that the public was "…interested in improving/restoring Naples Bay and Gulf of Mexico/Naples Beaches over other water bodies," indicating potential support for restoration of North and South Lake which discharge to the Gulf of Mexico.

2.2.4 CURRENT WATER QUALITY MONITORING PROGRAM

WSP is currently collecting water quality samples monthly from the City of Naples stormwater lakes, including North Lake and South Lake. Concentrations of TN and TP since 2020 are shown in **Preliminary data** analysis incorporating data from the current water quality program (through September 2022) and previously collected data back to 2014 (as summarized in Wood, 2022) indicate increasing concentrations of ammonia-nitrogen (an inorganic component of TN) in North Lake and increasing *Enterococci* and fecal coliform in South Lake. In the downstream lake (Alligator Lake), concentrations of orthophosphate (dissolved inorganic component of TP) and *Enterococci* were significantly increasing. Statistically significant trends in nutrients were not observed in North or South Lake; TN and chl-a were decreasing in Alligator Lake. However, while trends may be statistically significant, they may not be ecologically significant. A trend slope near zero likely will not show a measurable effect within a reasonable time frame (i.e., years to decades). Therefore, decreasing trends do not necessarily indicate that additional water quality improvement projects would not be beneficial.

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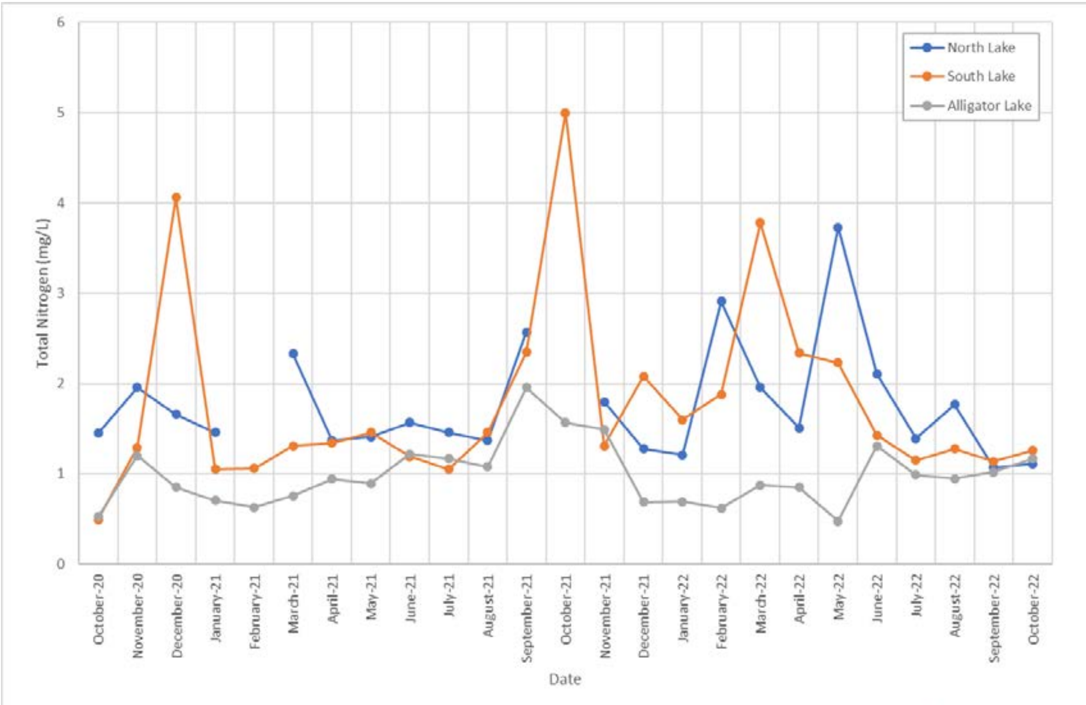

and

Figure 2. Total nitrogen concentrations in North Lake, South Lake, and Alligator Lake. Not displayed on the figure is the North Lake concentration from February 2021 which exceeded 40 mg/L and October 2021 of 8.5 mg/L. Nondetects displayed as the detection limit (0.05 mg/L), if applicable.

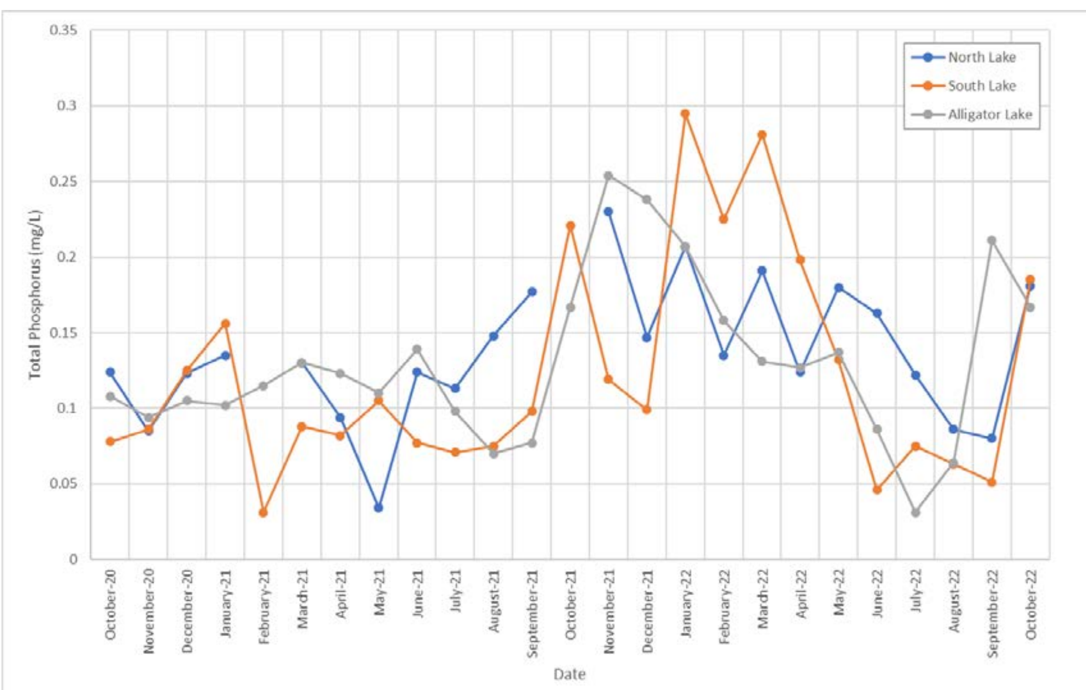

Figure 3. Preliminary data analysis incorporating data from the current water quality program (through September 2022) and previously collected data back to 2014 (as summarized in Wood, 2022) indicate increasing concentrations of ammonia-nitrogen (an inorganic component of TN) in North Lake and increasing *Enterococci* and fecal coliform

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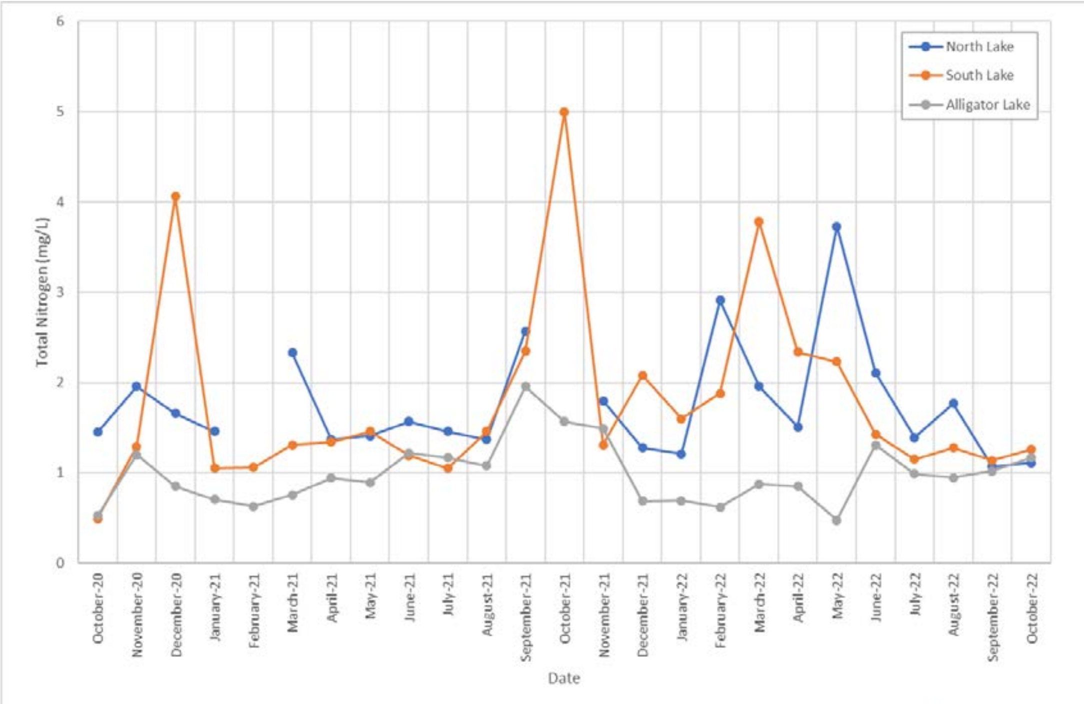

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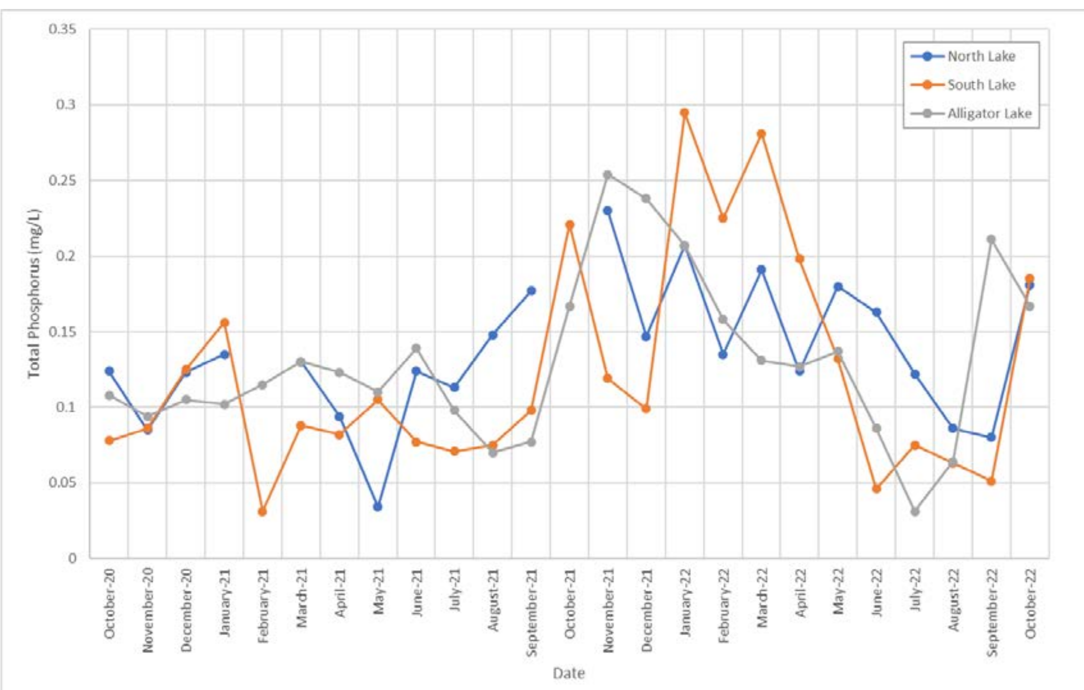

Figure 3. Total phosphorus concentrations in North Lake, South Lake, and Alligator Lake. Not displayed on the figure is the North Lake concentration from February 2021 of 3 mg/L and October 2021 of 1.7 mg/L. Nondetects displayed as the detection limit (0.008 mg/L), if applicable.

2.2.5 CONCLUSION OF DATA REVIEW

After assessing available data from North and South Lake, WSP expects that the current water quality dataset is sufficient for the North Lake and South Lake Feasibility Study. The sediment assessment conducted as part of the current project and described below, also provides valuable data, considering sediment samples have not been recently collected from North Lake and South Lake.

WSP also conducted ICPR modeling. Spatial data (in ArcGIS) on the stormwater infrastructure was provided by the City of Naples. The infrastructure dataset included the existing stormwater infrastructure (culverts, weirs, drop structures, surface ditches) relevant to the North Lake and South Lake watersheds. Review of these data were incorporated into the ICPR modeling task.

3 ECOLOGICAL EVALUATION

WSP conducted an ecological evaluation in September 2022, prior to Hurricane Ian. The lakes are artificial impoundments/reservoirs surrounded by medium density residential dwelling units according to the Florida Land Use and Cover Classification System (FLUCCS) (**Figure 4**). The Natural Resources Conservation Service (NRCS) soils map characterizes the area as surrounded by urban land at 0 to 2 percent slopes (

Figure 5). The National Wetlands Inventory (NWI) does not identify any wetlands, only surface waters, in or surrounding the project areas (

Figure 6)

3.1 WETLANDS AND SURFACE WATERS

WSP reviewed available topographic survey information, soil maps, land use maps, and NWI maps to prepare for the wetland delineation. The wetland delineation and field reconnaissance were completed September 1, 2022, by WSP scientists. The sites were delineated for wetlands using methods as described in the Delineation of the Landward Extent of Wetlands and Surface Waters [FDEP, Chapter 62.340, F.A.C]. This procedure uses a series of tests to address three characteristics of wetlands, including the presence/absence of hydrophytic vegetation, wetland hydrology, and hydric soils.

WSP conducted the field visit to characterize the delineated wetlands and surface waters. Delineation included onsite determination, marking in the field with a handheld GPS unit (sub-meter accuracy), and flagging of the aerial extent of each wetland (if any). Potential wetlands were identified along the littoral edge of the surface waters. A Uniform Mitigation Assessment Method (UMAM) was completed based on the current conditions of each lake (**Appendix A-1**).

The perimeter of each lake was assessed via kayak. No flows were observed out of the culverts at either site during the site visit. Emergent vegetation and species composition was notated. The vegetation across both sites was comprised primarily of non-native species, with some native species in concentrated areas. Prevalent species throughout both sites include alligator weed (*Alternanthera philoxeroides*) and Peruvian primrose-willow (*Ludwigia peruviana*).

North Lake was dominated by alligator weed and Peruvian primrose-willow with less than 5% desirable cover around the lake’s perimeter (

Figure 7). About two-thirds of the lake was covered by duckweed (*Lemna* sp.) during the site visit. Queen palm (*Syagrus romanzoffiana)*, coconut palm (*Cocos nucifera*), and Bismarck Palm (*Bismarckia nobilis*) were identified around the perimeter of North Lake as well.

South Lake was characterized primarily by alligator weed scattered around the lake's perimeter at varying distances of 3 to 6 feet from shore (

Figure 8). Most residential yards surrounding South Lake include sod maintained to the lake's edge and had little to no emergent vegetation, with most having a slope of 60 degrees or greater at the lakes edge. The color in South Lake was a blue tint likely due to an additive. Four bubblers were active and a film on the water surface was observed at the time of the site visit. Florida royal palm (*Roystonea regia*), queen palm, coconut palm, and Sabal palm (*Sabal palmetto*) were identified around the perimeter of South Lake.

A list of all observed plant species at both sites is included in **Table 31**. Site photographs are included in **Appendix A-2**.

3.2 THREATENED AND ENDANGERED SPECIES SURVEY

The threatened and endangered (T&E) species survey was conducted in two phases consistent with the Environmental Resource Permit (ERP) application for the proposed action. The first phase was a literature search and mapping effort to identify species potentially found on the site. Available data was gathered through an online data search of the Florida Fish and Wildlife Conservation Commission (FWC), United States Fish and Wildlife Service (USFWS), Florida Natural Areas Inventory (FNAI), Florida Geographic Data Library (FGDL), and other sources. Maps of previous sightings and critical habitat of listed species were compiled. Distances from the project site to adjacent features were calculated and compared to regulatory constraints. A wildlife map was produced in GIS format and is presented in

Figure 9. Potential listed species occurrences are presented **in Appendix A-3**.

During the site visit, WSP scientists conducted a kayak-based visual survey. Records were made of any wildlife observed, listed plant species found, any evidence of wildlife utilization, and appropriate habitat for listed species.

The American wood stork core foraging area overlaps with the northeast corner of the lake (

Figure 9). No wood storks were observed within the proximity of either lake project area during the site investigation. This report can be submitted to the regulatory agencies as an exhibit noting that listed species are possibly present by not likely to be adversely affected by the proposed development. Non-listed fauna encountered at the two sites are summarized in **Table 2**. While not a complete listing of every species found, it is representative of the sites.

A listing of threatened and endangered species for Collier County, Florida, was obtained from the USFWS Information for Planning and Consultation (IPaC) website (http://ecos.fws.gov/ipac). According to the report, there are 19 species (four mammals, five birds, five reptiles/amphibians, one fish, three insects, and one flowering plant) that are known to occur or have the potential to occur within the vicinity of the project areas. There are no critical habitats listed within the project areas. A copy of the Trust Resources List is included in Appendix A3.

Additionally, WSP generated a Biodiversity Matrix from the FNAI website (http://www.fnai.org/biointro.cfm) to determine if State-listed species may be affected by the proposed project. According to the report, there are 29 species that are known to occur, or have the potential to occur within the vicinity of the project areas. This report does contain some overlap with the Federal listings from IPaC. A copy of the Biodiversity Matrix Query Results is included in Appendix A3.

Notable species listed in the FNAI Biodiversity Matrix and IPaC Trust Resources list potentially impacted at the project site are described below:

— American Alligator: The American alligator (*Alligator mississippiensis*) is federally protected by the Endangered Species Act (ESA) as a threatened species and as a state threatened species by Florida's Endangered and Threatened Species Rule. This is due to their similarity of appearance to the American crocodile (*Crocodylus acutus*), which is a federally endangered species. Alligator habitat includes permanent bodies of water such as lakes, rivers, and swamps. No alligator were observed during the kayak survey. The proposed dredging of North and South Lakes are not expected to have a permanent habitat impact. Additionally, due to the transient nature of this species, it would be expected that any alligators currently using the immediate project area would relocate to the ample available habitat of the surrounding area without disruption of their normal behavior.

Wood stork: While a small section of North Lake is within a core foraging area, no wood storks (*Mycteria americana*) were observed on site (

- **Figure 9**). This species is listed as threatened under the ESA Wood storks prefer continuously inundated wetland areas, limited to depths less than 10-12 inches. Based on these findings, we conclude that there is appropriate habitat for this species within the project area, however, the project as designed is not likely to impact this species or its habitat.

Other listed species noted in the FNAI Biodiversity Matrix and IPaC Trust Resources list were not considered to be present or potentially impacted at the project site. Transient species have the potential to be present on-site at any time. Any potential impacts on these species will be temporary and minimal.

ATTACHMENT A

Table 31. Plant species observed at North Lake and South Lake.

Species	Common Name	Native or Non-native	FDEP Status
North Lake			
Albizia julibrissin	Silktree; Mimosa	Non-native	FISC Category 1
Alternanthera philoxeroides	Alligator weed	Non-native	FISC Category 2
Annona glabra	Pond apple	Native	OBL
Azolla sp.	Mosquitofern		
Boehmeria cylindrica	False nettle; Bog hemp	Native	OBL
Canna sp.			
Coccoloba uvifera	Seagrape	Native	
Cupaniopsis anacardiodes	Carrotwood tree	Non-native	
Hydrocotyle umbellata	Manyflower Marshpennywort	Native	FACW
Lemna sp.	Duckweed	Native	
Ludwigia peruviana	Peruvian primrose-willow	Non-native	FISC Category 1 OBL
Najas guadalupensis	Southern waternymph	Native	
Pontederia cordata	Pickerelweed	Native	OBL
Schinus tereninthifolia	Brazilian peppertree	Non-native	FISC Category 1
Typha sp.	Cattail	Native	OBL
South Lake			
Alternanthera philoxeroides	Alligator weed	Non-native	FISC Category 2
Crinum americanum	Seven-sisters; String-lily	Native	OBL
Cyperus papyrus	Papyrus flatsedge	Non-native	OBL
Ludwigia peruviana	Peruvian primrose-willow	Non-native	FISC Category 1 OBL
Panicum repens	Torpedograss	Non-native	FISC Category 1 FACW
Pontederia cordata	Pickerelweed	Native	OBL
Schinus tereninthifolia	Brazilian peppertree	Non-native	FISC Category 1

Table 2. Fauna observed at North Lake and South Lake.

Species	Common Name	Comments
North Lake		
Cairina moschata	Muscovy duck	
Centropomus undecimalis	Snook	
Egretta thula	Snowy egret	
Gallinula chloropus	Moorhen	
Gambusia holbrooki	Mosquitofish	
South Lake		
Gallinula chloropus	Moorhen	
Butorides virescens	Little green heron	
Gambusia holbrooki	Mosquitofish	
Cyanocitta cristata	Blue jay	
Corvus sp.	Crow	
Ardea alba	Great egret	
Eudocimus albus	White Ibis	
Cairina moschata	Muscovy duck	
Mimus polyglottos	Mockingbird	
Centropomus undecimalis	Snook	Did not observe; resident informed
Megalops atlanticus	Tarpon	Did not observe; resident informed
Centrarchidae (family)	Sunfish	Did not observe; resident informed

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Figure 4. North Lake and South Lake surrounding land use map.

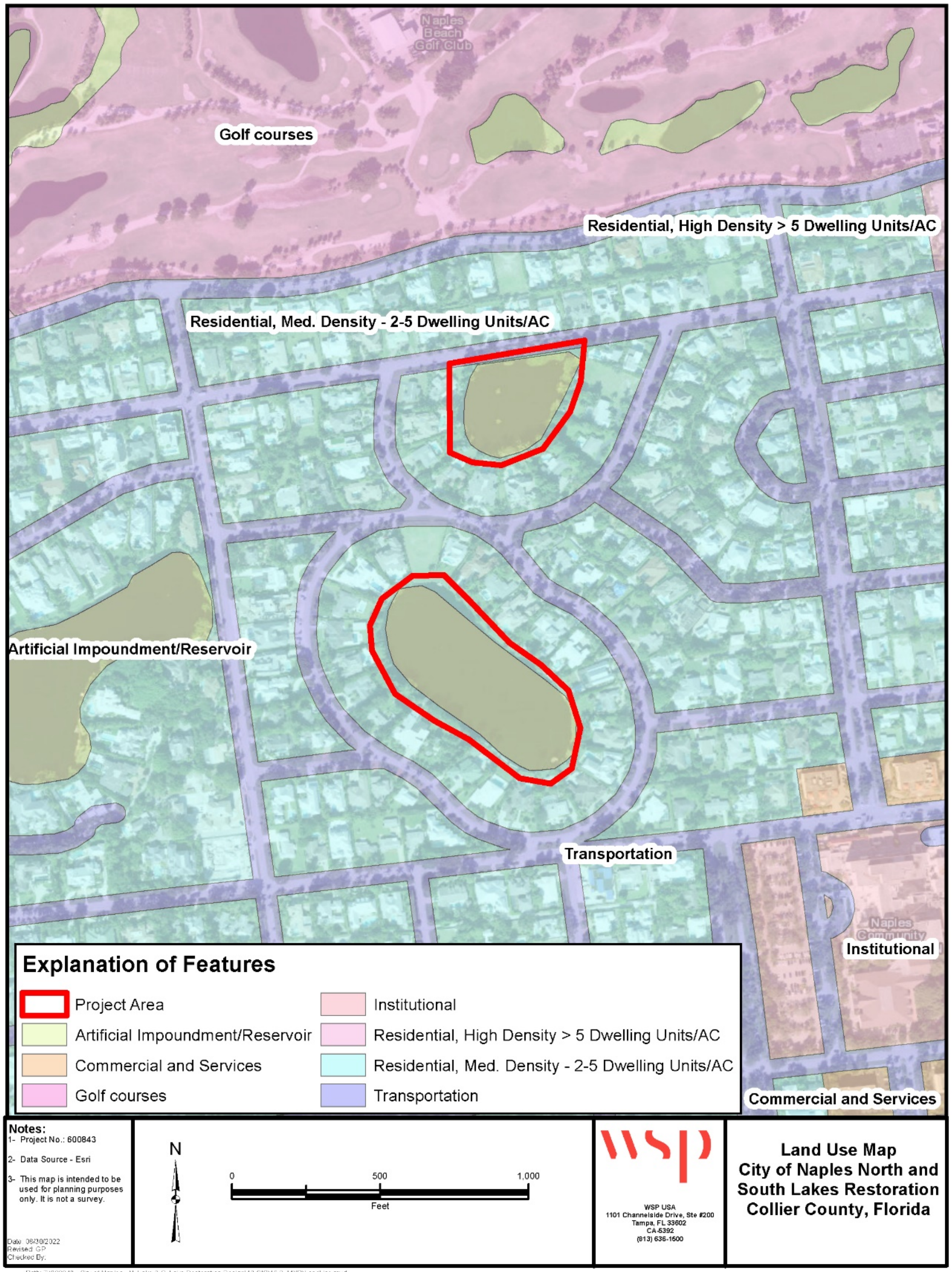

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Figure 5. NRCS soils map for North Lake and South Lake.

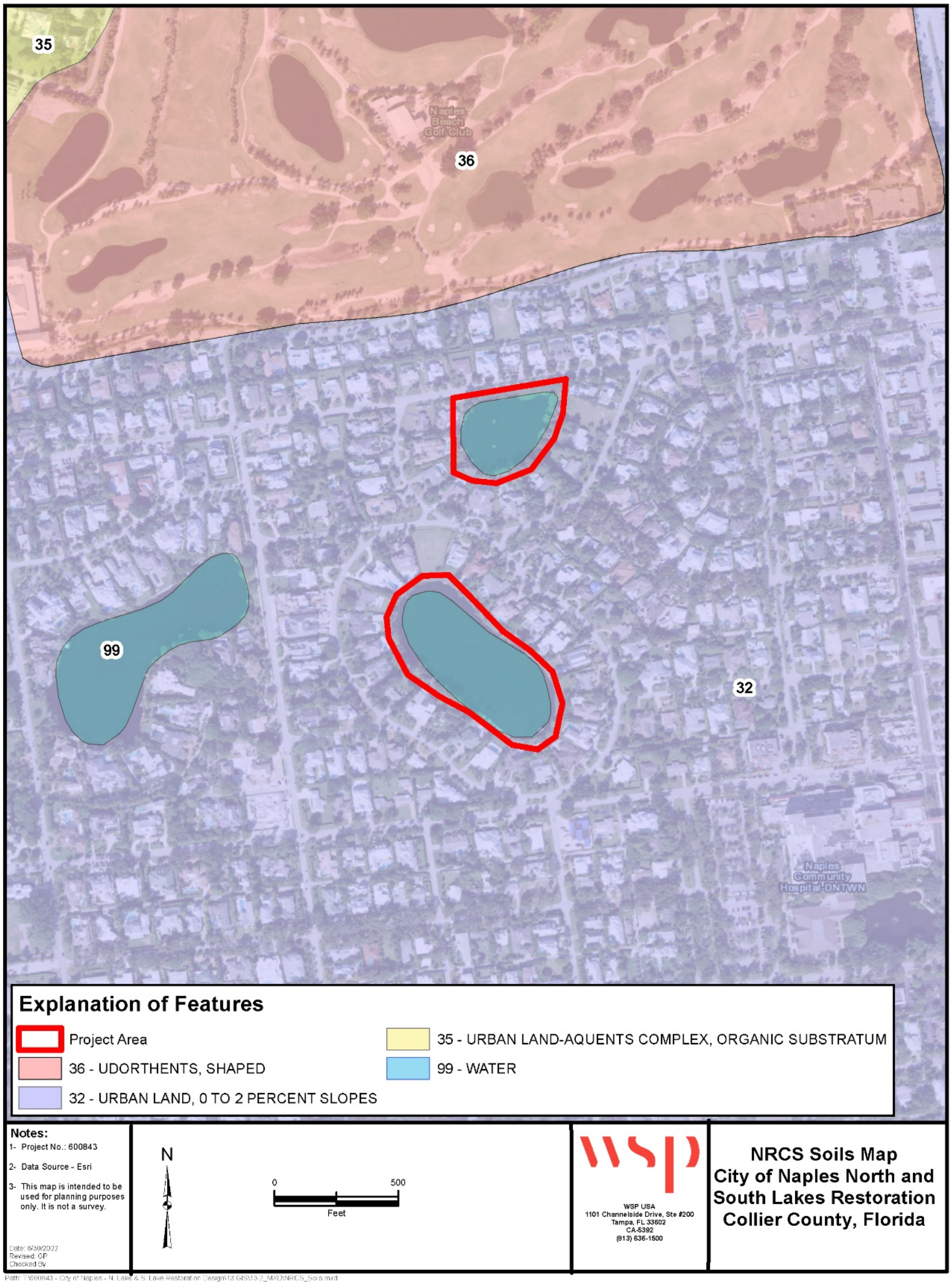

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Figure 6. NWI wetland map for North Lake and South Lake.

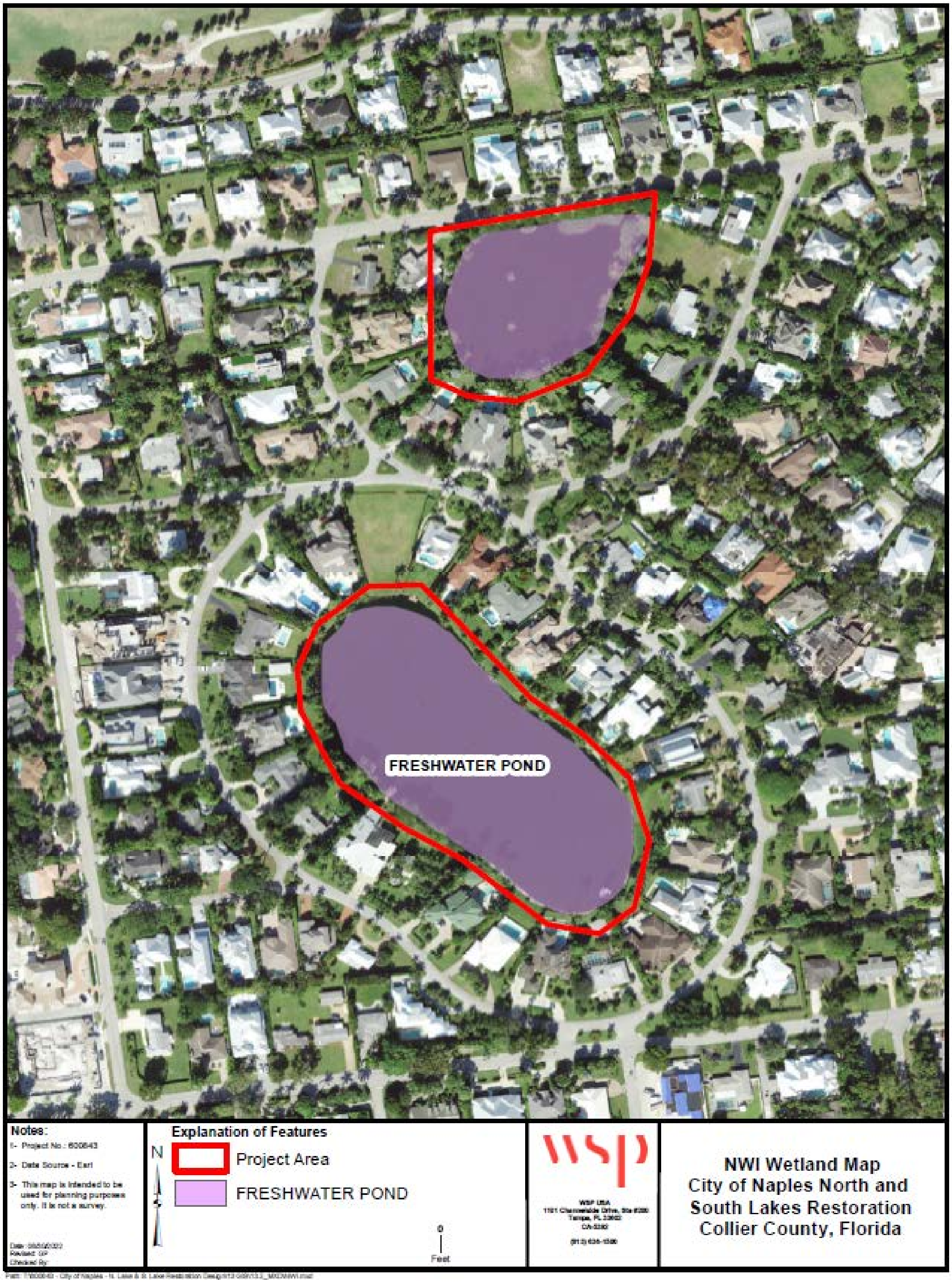

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Figure 7. Vegetation boundary line for North Lake.

ATTACHMENT A

Figure 8. Vegetation boundary line for South Lake.

ATTACHMENT A

Figure 9. Wildlife map for North Lake and South Lake.

ATTACHMENT A

4 SEDIMENT EVALUATION

4.1 SEDIMENT ENGINEERING EVALUATION

WSP conducted engineering site visits with survey and coring to assess site conditions in North Lake and South Lake. Sediment cores were collected from each lake (**Table 4. Select analytical data for composited sediment samples collected in November 2022 from North Lake and South Lake with comparison to groundwater criteria.**

Lake	Composite Sample ID (Sample Locations used in Composite)	Total Arsenic (ug/L)	Cadmium (ug/L)	Total Chro-mium (ug/L)	Total Lead (ug/L)
North Lake (Lake 8)	LAKE 8 Comp #3 (1, 3, 7)	**110**	3.3 U	17.0 U	21.0 U
	LAKE 8 Comp # 2 (2, 4, 8)	**42 I**	3.3 U	17.0 U	21.0 U
	LAKE 8 Comp #1 (6, 5, 9)	34.0 U	3.3 U	17.0 U	21.0 U
South Lake (Lake 9)	LAKE 9 Comp #1 (1, 3, 4)	34.0 U	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #5 (15, 16, 19, 22)	**51 I**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp # 6 (17, 18, 20, 21)	**100**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #2 (2, 5, 6)	**98 I**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #3 (7, 9, 10, 13)	34.0 U	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #8 (11, 12, 14,)	**42 I**	3.3 U	17.0 U	21.0 U
FDEP Criteria	GCTLs	10	5	100	15
	NADCs	100	50	1000	150

Notes:

NA = Not Available

NS = Not Sampled

GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table V of Chapter 62-777, F.A.C.

Exceeds GCTL Limit

Exceeds NADC Limit

I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U = Compound was analyzed but not detected.

Figure 10) on November 14 and 15, 2022. At each sample location, intact cores were collected to the depth of the consolidated sand layer. Cores were then composited (as indicated in **Figure 10)** and each composited core sample was submitted to an analytical laboratory for physical and chemical analysis. Physical testing of each core included moisture content (ASTM D2216), percent fines (D1140), and organic matter (D2974). Chemical characterization included nitrogen and phosphorus to characterize the benefits of removal; and metals, Total Recoverable Petroleum Hydrocarbons (TRPH), and polynuclear aromatic hydrocarbons (PAHs) that may affect disposal or beneficial re-use options. A survey was conducted to assess water depth and muck thickness via sediment probing. The survey work was conducted in September (12-15 and 21-22) and October (17-18) 2022.

Analysis of the sediment core data are underway and preliminary laboratory results have been received (**Appendix B**). These results indicate exceedances of the FDEP's Soil Cleanup Target Levels (SCTLs) for arsenic, copper, benzo (a) pyrene (BAP), and the total BAP equivalent in both lakes. Arsenic concentrations also exceeded groundwater FDEP criteria (e.g., Groundwater cleanup target levels [GCTL]). Chemical suites with exceedances are included in **Table 3** and **Table 4**. Nutrient concentrations are also included in **Table 3**. Additional data is included in **Appendix B**. Results from soft sediment thickness mapping in North Lake (

Figure 11) and South Lake (

Figure 12) indicate almost 3 feet of highly organic sediment in portions of North Lake and up to 2 feet of highly organic sediment in portions of South Lake. Note: South Lake sediment elevations were collected both before and after Hurricane Ian and analysis of the survey points did not reveal evidence of differences in data between the collection dates.

The survey and sediment data will be used in future deliverables to estimate the volume of highly organic sediments for potential removal, the texture of these materials, and how it affects dredged material management/dewatering; nutrient loading which indicates the benefits of sediment removal on receiving waters; and contaminants that may affect disposal and beneficial re-use options.

ATTACHMENT A

Table 3. Select analytical data for composited sediment samples collected in November 2022 from North Lake and South Lake with comparison to soil criteria.

Lake	Composite Sample ID (Sample Locations used in Composite)	Metals (mg/kg)									PAHs								Nutrients (mg/kg) and Physical (%)				
		Arsenic	Cadmium	Chromium	Lead	Barium	Copper	Mercury	Selenium	Silver	Benzo (a) pyrene	Benzo (a) anthra-cene	Benzo (b) fluoran-thene	Benzo (k) fluoran-thene	Chrysene	Dibenz (a,h) anthra-cene	Indeno (1,2,3-cd) pyrene	Benzo (a) pyrene equivalent	Total Nitrogen Soil	Total Kjeldahl Nitrogen	Nitrogen, NO2 plus NO3	Phosphorus, Total (as P)	Percent Moisture (%)
North Lake (Lake 8)	LAKE 8 Comp #3 (1, 3, 7)	16.4	0.17	5.1	28.9	1.5	44.3	0.074	1.0 U	0.15 U	0.23 I	0.045 U	0.28 I	0.12 I	0.047 I	0.078 U	0.16 I	0.32	1930	1930	0.56 U	106	55.3
	LAKE 8 Comp # 2 (2, 4, 8)	4.2	0.058 I	1.8	10.2	0.58 I	24.2	0.02	0.58 U	0.086 U	0.046 U	0.025 U	0.050 U	0.050 U	0.025 U	0.043 U	0.043 U	0.051	675	675	0.38 U	43.3 I	33.6
	LAKE 8 Comp #1 (6, 5, 9)	4.1	0.11	4.6	37.2	2.2	26.8	0.021	1.5	0.083 U	0.067 I	0.063 I	0.10 I	0.043 U	0.074 I	0.037 U	0.039 I	0.11	755	755	0.35 U	140	27.9
South Lake (Lake 9)	LAKE 9 Comp #1 (1, 3, 4)	5.2	0.3	2.6	2.8	1.3	114	0.022	0.66 U	0.097 U	0.31 I	0.15 I	0.43	0.15 I	0.16 I	0.075 U	0.18 I	0.43	983	983	0.46 U	59.4	45.4
	LAKE 9 Comp #5 (15, 16, 19, 22)	15.6	0.086 I	4	4.2	1.9	51.8	0.034	1.1 U	0.16 U	0.11 U	0.060 U	0.16 I	0.12 U	0.060 U	0.10 U	0.10 U	0.13	2210	2210	1.5	69.5 I	59.4
	LAKE 9 Comp # 6 (17, 18, 20, 21)	14.5	0.28	6.6	5.2	1.5	345	0.043	1.0 U	0.15 U	0.093 U	0.050 U	0.10 U	0.10 U	0.050 U	0.087 U	0.086 U	0.1	1210	1210	0.69 U	76.6 I	63.6
	LAKE 9 Comp #2 (2, 5, 6)	10.6	0.26	4.5	4.3	2.1	245	0.042	0.90 U	0.13 U	0.090 U	0.048 U	0.097 U	0.097 U	0.048 U	0.084 U	0.083 U	0.099	2500	2500	0.56 U	146	55.3
	LAKE 9 Comp #3 (7, 9, 10, 13)	0.49 I	0.032 U	0.30 I	0.43 I	0.19 I	3	0.0092 I	0.48 U	0.070 U	0.074 I	0.041 I	0.11 I	0.047 U	0.035 I	0.041 U	0.046 I	0.11	148	148	0.32 U	33.7 U	23.5
	LAKE 9 Comp 8 11 12 14	9.2	0.37	6.1	8.1	1.9	172	0.068	1.3 U	0.19 U	0.15 U	0.081 U	0.16 U	0.16 U	0.081 U	0.14 U	0.14 U	0.16	769	769	0.81 U	83.6 U	68.9
FDEP Criteria	Leachability Based on Groundwater Criteria (mg/kg)	*	7.5	38	*	1600	NA	2.1	5.2	17	8	0.8	2.4	24	77	0.7	6.6	**	NA	NA	NA	NA	NA
	Direct Exposure Residential (mg/kg)	2.1	82	210	400	120	150	3	440	410	0.1	#	#	#	#	#	#	0.1	NA	NA	NA	NA	NA
	Direct Exposure Commercial/Industrial (mg/kg)	12	1700	470	1400	130000	89000	17	11000	8200	0.7	#	#	#	#	#	#	0.7	NA	NA	NA	NA	NA

Notes:

NA = Not Available

NS = Not Sampled

* = Leachability value may be determined using TCLP.

= Direct Exposure value not applicable except as part of the Benzo(a)pyrene equivalent.

** = Leachability value not applicable

Exceeds Leachability Based on Groundwater Criteria Limits

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limits

I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U = Compound was analyzed but not detected.

Table 4. Select analytical data for composited sediment samples collected in November 2022 from North Lake and South Lake with comparison to groundwater criteria.

Lake	Composite Sample ID (Sample Locations used in Composite)	Total Arsenic (ug/L)	Cadmium (ug/L)	Total Chro-mium (ug/L)	Total Lead (ug/L)
North Lake (Lake 8)	LAKE 8 Comp #3 (1, 3, 7)	**110**	3.3 U	17.0 U	21.0 U
	LAKE 8 Comp # 2 (2, 4, 8)	**42 I**	3.3 U	17.0 U	21.0 U
	LAKE 8 Comp #1 (6, 5, 9)	34.0 U	3.3 U	17.0 U	21.0 U
South Lake (Lake 9)	LAKE 9 Comp #1 (1, 3, 4)	34.0 U	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #5 (15, 16, 19, 22)	**51 I**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp # 6 (17, 18, 20, 21)	**100**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #2 (2, 5, 6)	**98 I**	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #3 (7, 9, 10, 13)	34.0 U	3.3 U	17.0 U	21.0 U
	LAKE 9 Comp #8 (11, 12, 14,)	**42 I**	3.3 U	17.0 U	21.0 U
FDEP Criteria	GCTLs	10	5	100	15
	NADCs	100	50	1000	150

Notes:

NA = Not Available

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GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table V of Chapter 62-777, F.A.C.

Exceeds GCTL Limit

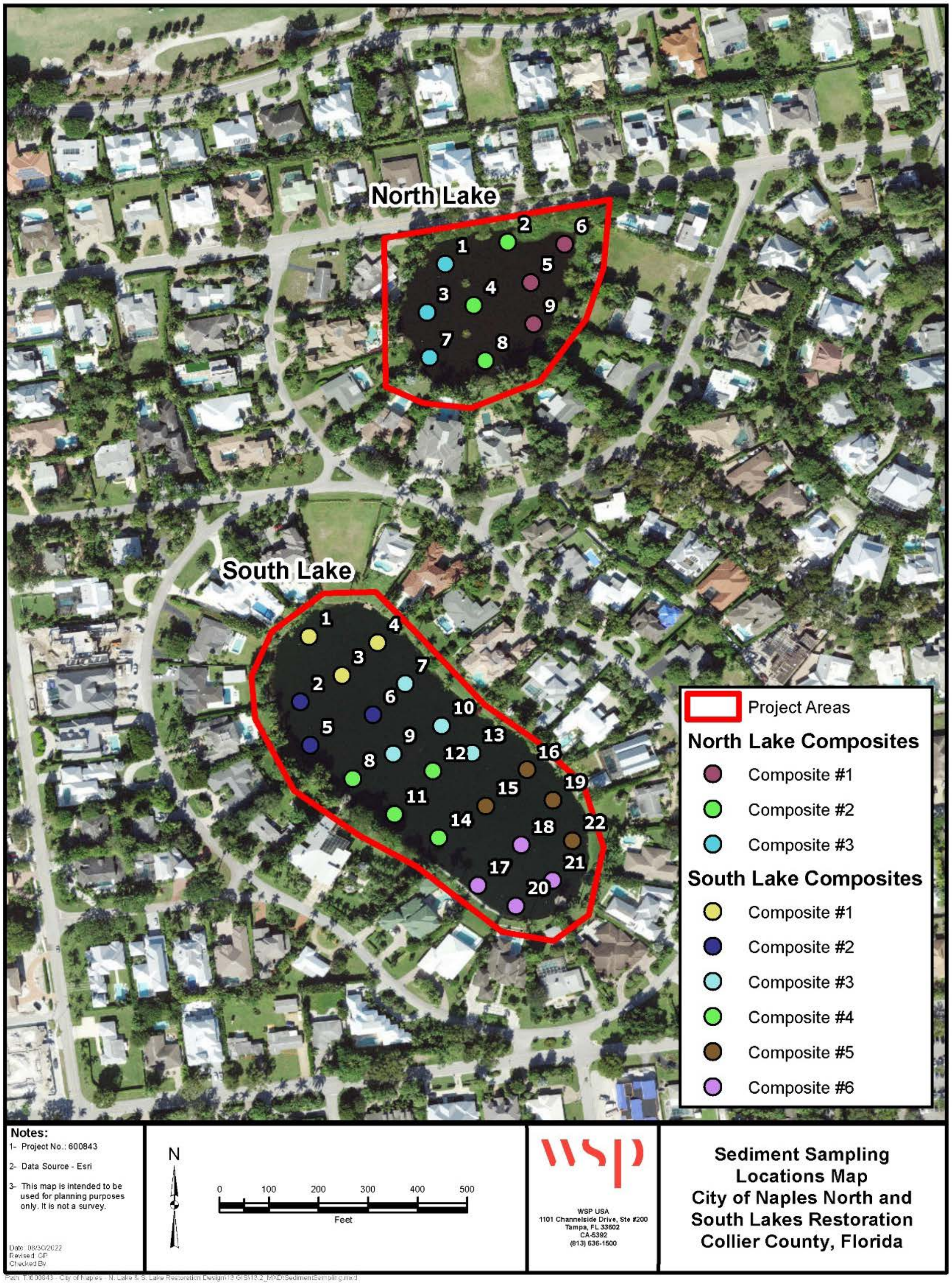
Exceeds NADC Limit

I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

U = Compound was analyzed but not detected.

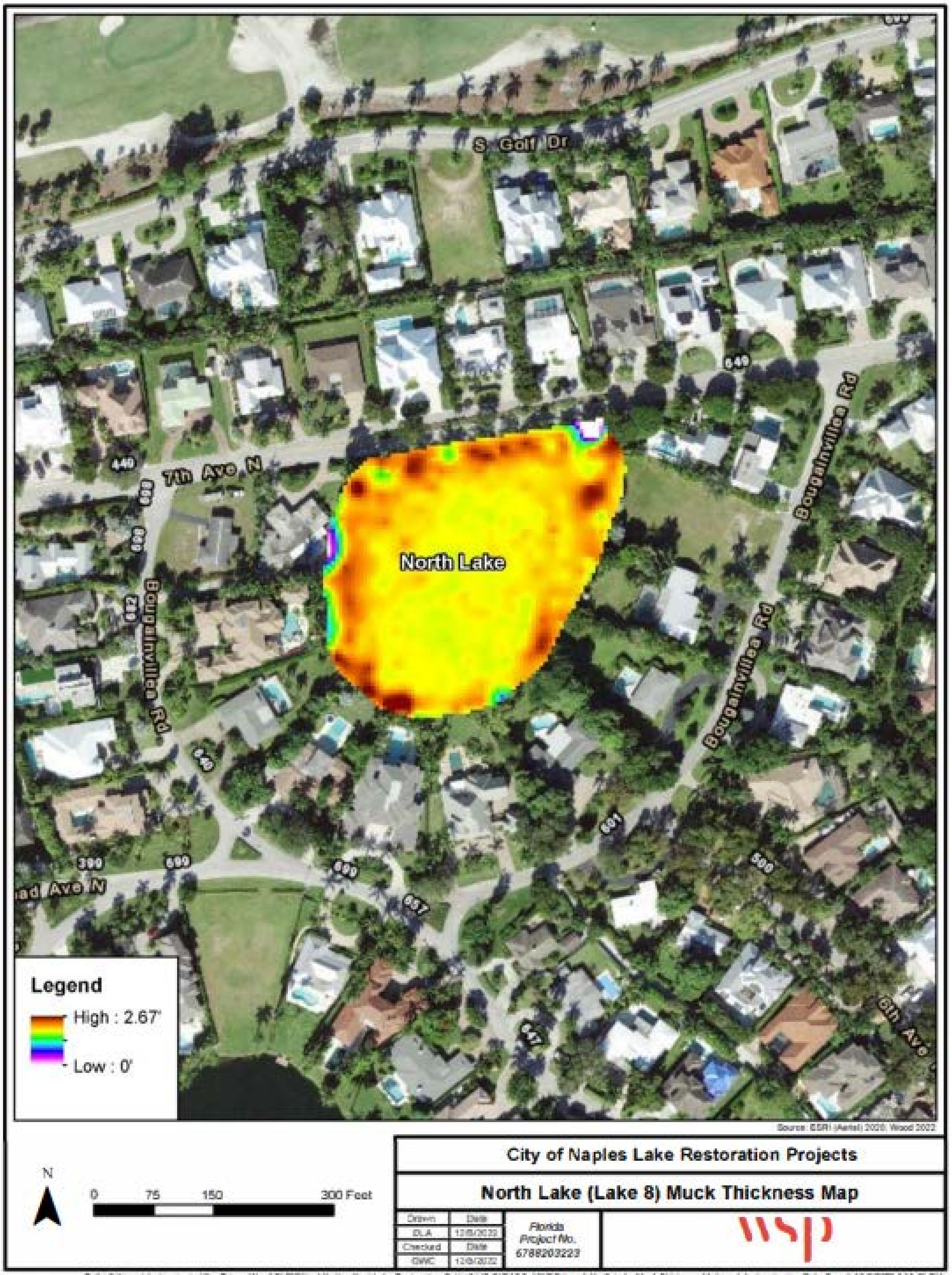
ATTACHMENT A

Figure 10. Sediment sampling and composite locations.



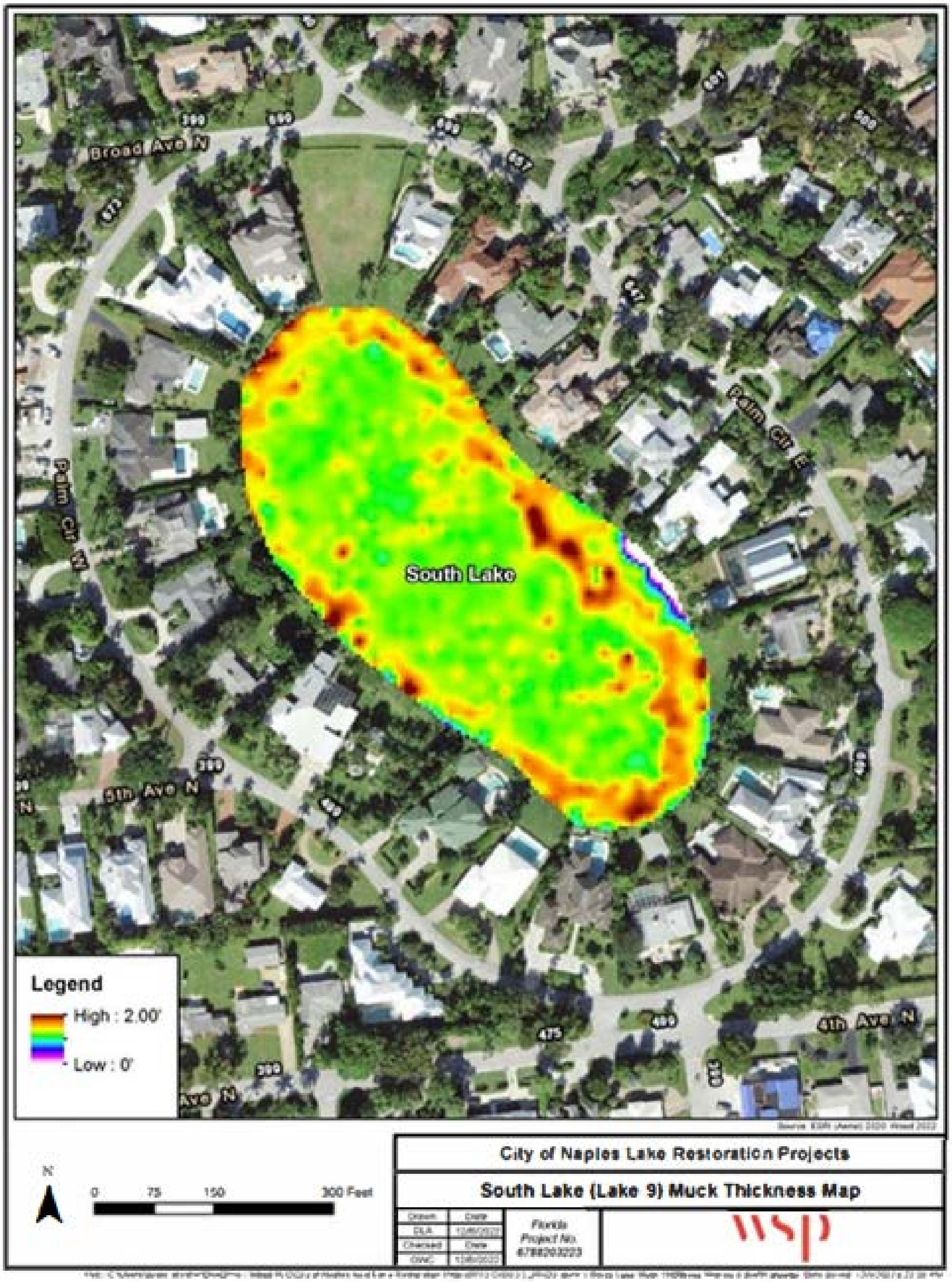
ATTACHMENT A

Figure 11. Soft sediment thickness in North Lake.



ATTACHMENT A

Figure 12. Soft sediment thickness in South Lake.



4.2 SEDIMENT FLUX

A pair of intact sediment cores were collected from North Lake and South Lake on September 12, 2022, in clear polycarbonate cylinders (7.3 cm diameter, 30 cm long). Sampling locations were chosen based on the amount of available sediment at locations close to inflow and outflow culverts. At the time of sampling, in-situ physicochemical data were recorded using a multiparameter sonde. Parameters included water temperature, dissolved oxygen (DO), pH, specific conductivity, salinity, and turbidity. Near-bottom ambient lake water was collected at the time of coring and filtered for use during sediment nutrient flux incubations. Sediment flux analyses were performed in the WSP USA Flux Laboratory in accordance with Standard Operating Procedure (SOP) Wood-SFLUX-002 Rev. 9. Sediment cores were prepared and incubated as two sets of two cores in a controlled environment under aerobic and anoxic conditions. The flux procedures are described briefly below, with additional details provided in **Appendix C.**

Water column samples for each core were collected at 0, 24, 48, 96, 168, and 216 hours and analyzed for TP, ammonia, and iron in a NELAC certified analytical laboratory. Sediment nutrient flux rates were estimated using the nutrient release rate (NRR) equation and the slopes were calculated from the concentration vs. time curve as described in the flux SOP. Annual internal nutrient loads were estimated at both stations and as spatial averages following the methods described by Ogdahl et al. (2014). Overall average loads were calculated from average flux rates representing the average anoxic and aerobic rates for both stations.

Average flux rates were calculated for aerobic and anoxic rates and the values were applied to the entire surface area of each pond to estimate representative values for internal loading rates. These flux rates may be further refined based on the results of the sediment engineering survey (e.g., flux rates may be applied to just those areas with highly organic sediments versus the entire lake). The internal loads calculated for the North Lake sediment core incubated under anoxic conditions were -8.84 lb/yr of TP, 57.66 lb/yr of ammonia, and 1.06 lb/yr of iron using the slope method. Using the NRR equation, internal loads were 0.00 lb/yr TP, 55.29 lb/yr ammonia, and 2.22 lb/yr iron. Under aerobic conditions, the North Lake sediment core displayed internal loads of 0.55 lb/yr TP, 45.03 lb/yr ammonia, and 1.56 lb/yr iron using the slope method. Using the NRR equation, the internal loads were 5.81 lb/yr TP, 56.24 lb/yr ammonia, and 2.98 lb/yr iron.

The internal loads calculated for the South Lake sediment core incubated under anoxic conditions were -22.60 lb/yr of TP, 159.39 lb/yr of ammonia, and 0.87 lb/yr of iron using the slope method. Using the NRR equation, internal loads were 1.65 lb/yr TP, 136.65 lb/yr ammonia, and 4.08 lb/yr iron. Under aerobic conditions, the South Lake sediment core displayed internal loads of -27.16 lb/yr TP, 16.03 lb/yr ammonia, and 1.90 lb/yr iron using the slope method. Using the NRR equation, the internal loads were 0.00 lb/yr TP, 21.20 lb/yr ammonia, and 1.96 lb/yr iron.

Sediment flux analysis showed similar TP, ammonia, and iron concentration values between North Lake and South Lake. Flux rates and loads calculated using the slope equation were on average lower and more conservative as compared to the values calculated by the NRR equation. However, both sets of equations suggest that each lake has the potential to act as a source of nitrogen while acting as a sink for phosphorus. Therefore, it is recommended that measures are taken to conduct targeted dredging and enhance ammonia uptake by biological processes.

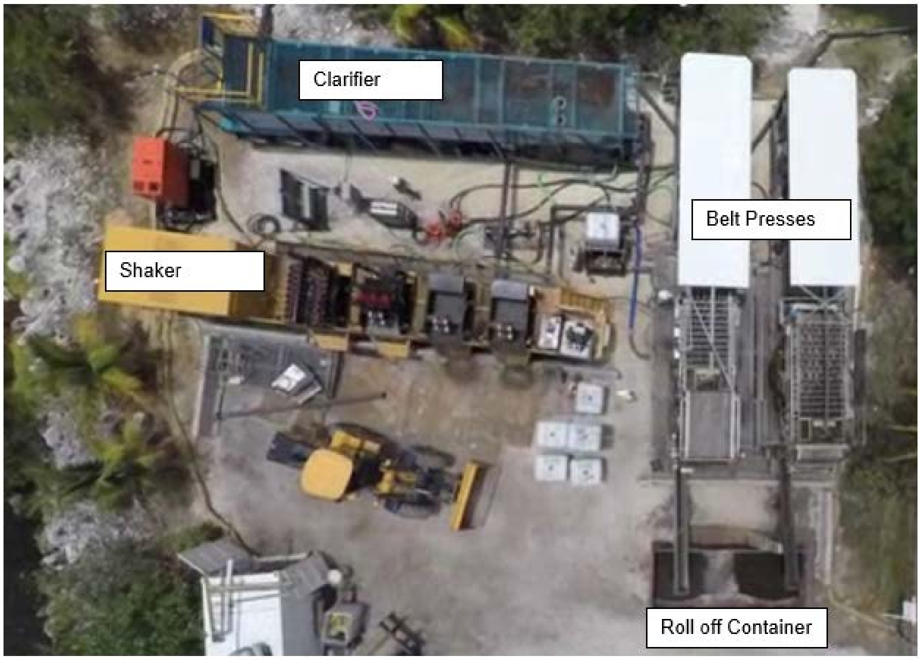
5 WATER QUALITY IMPROVEMENT TECHNOLOGIES

Best management practices (BMPs) that could improve water quality within North Lake and South Lake include dredging, bio-augmented aeration, floating islands, littoral shelf modifications, and littoral shelf plantings. There are also several in-line stormwater system improvements that can treat these contaminants upstream of entering the lake, including exfiltration trenches, curb inlet baskets, and rain gardens and/or vegetated swales at key locations within the basin. Potential water quality improvement technologies that may be beneficial to North and South lakes are described below. More targeted recommendations will be included in future deliverables.

5.1 DREDGING

There are two traditional methodologies for removal of muck sediments, mechanical and hydraulic dredging. Based on the above results for thickness and consistency, it is recommended to utilize a hydraulic dredging system as a mechanical dredging requires heavy equipment and would not be efficient in removing fine organic sediment. Mechanical dredging also requires a large footprint for dewatering since the material needs ample time to dry for hauling to a disposal area. Hydraulic dredging is a relatively low impact method of sediment removal with few effects on the surrounding environmental system. Hydraulic dredging includes a floating dredge, which essentially acts as a floating vacuum cleaner, and a temporary pipeline to transport the dredged material as a slurry to the dewatering site. The volume of the sediment slurry is greater than the in-situ volume of the sediment. The volume of dredge material can be better controlled with a hydraulic dredge than with mechanical dredging techniques. There are various types of hydraulic dredges available for sediment removal, such as the swing ladder, cutterhead, horizontal auger, plain suction, pneumatic, specialty dredge heads and diver-assisted dredge heads.

Based on past project experience, dredging has shown positive results in the improvement of water quality with Lakes, including City of Naples Lake Manor, Fleischmann Lake, Spring Lake, and East Lake. However, the technology is expensive and requires a large vacant footprint to dewater and dispose of the dredged material. The organic muck would be removed via hydraulic vacuum dredge and dewatered using either a mechanical, passive, or combination system. In mechanical dewatering, the dredged slurry is passed through a system of shakers and belt press filters to remove and dry trash and solids for disposal. In passive dewatering, the dredged slurry is passed through a system of screens and weirs to remove trash and solids and then pumped into roll off containers lined with geotextile bags to compress and dry removed material for disposal. In both systems, effluent is returned to the lake after solids are removed. In mechanical dredging, the effluent is typically passed through a clarifier tank prior to discharge into the lake.



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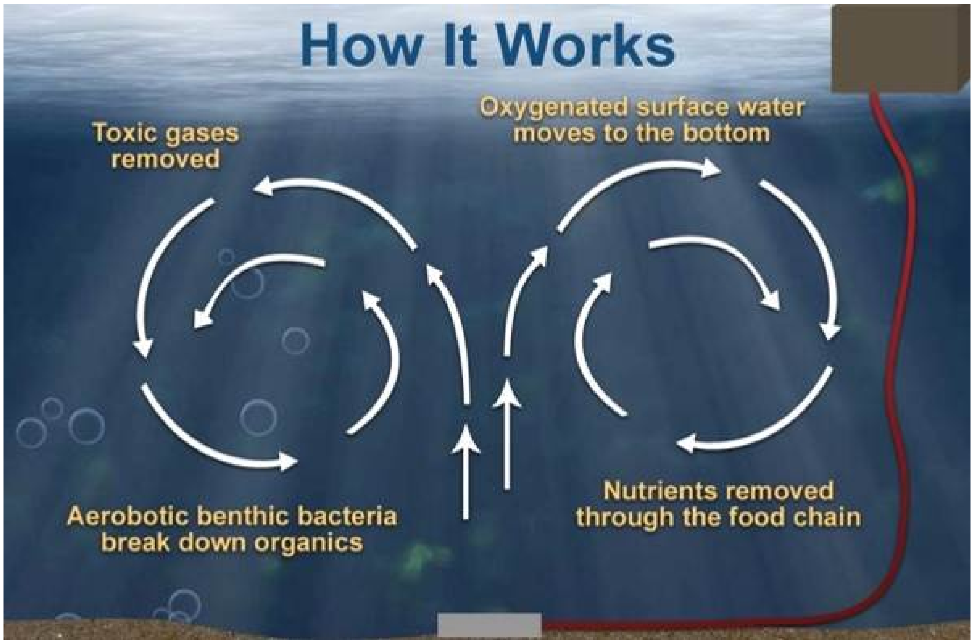
In areas with limited dewatering areas, a passive dewatering system with a series of roll off containers lined with geotextile bags and a polymer injection system may be recommended. The chemical results indicated the material exceeds the FDEP SCTLs for certain contaminants and therefore the disposal will need to be revaluated during the design process to determine if the material can be mixed and beneficial reused or sent to an approved Class I landfill for disposal. The cost of the dredging alternative will be much greater if the dredged material requires disposal in a landfill.

5.2 BIO-AUGMENTED AERATION

Stagnant water leads to accumulation of harmful and dangerous bacteria, low dissolved oxygen prohibits more beneficial aerobic bacteria from living, muck accumulates faster than the anaerobic bacteria can process it, and excess nutrients from fertilizer and run-off add to the cloudiness of the water. Aeration can correct and reverse these problems. When an aeration system is installed and turned on in a water body, a rotation of water begins that forms a doughnut pattern around the diffuser, see figure below. Water is taken into the bubble stream at the diffuser and moved toward the surface by the rising bubbles.

Introduction of aerobic bacteria will expedite this process and will cause compression of the muck as the bacteria breaks down the organic material. When the Lake bottom is anaerobic, roots and other organic material pile up without being decomposed. This leads to a large collection of organic material that remains in an undecomposed state until it is slowly broken down by anaerobic bacteria. Anaerobic decomposition is 30 to 40 times slower than aerobic decomposition, and many lakes accumulate organic material due to fertilizer runoff and other contaminates faster than this process occurs. With the introduction of oxygen at the lakebed, aerobic bacteria can take over and decompose muck faster. The bacteria that will be introduced to accomplish this are broad spectrum strains of naturally occurring bacteria with the ability to degrade most organic compounds.

Bio-augmented aeration consists of small solar powered aeration systems coupled with biological enhancements such as macro-algae. Bio-augmented aeration is completed in a modular approach, with a typical spacing of approximately 100 feet between aeration systems.



5.3 FLOATING ISLANDS

Floating islands provide nutrient uptake from the permanent pool of the wet detention pond. Floating islands generally consist of components of a typical wetland, but instead of a soil medium, the roots are anchored in an inert, floating medium and suspended within the water column. This provides the plants direct access to the soluble, bioavailable nutrients that are within the water column and targeted for removal. The floating root mass also provides an ideal substrate for periphyton growth, which works synergistically with the emergent vegetation to enhance nutrient uptake and sequestration. If designed correctly, this direct interaction between wetland root mass and water column nutrients can provide for very efficient nutrient flux and uptake and represents one of the strengths of these hydroponic systems.

Floating island nutrient removal efficiency can be variable and is highly dependent upon proper installation and maintenance. Researchers at University of Central Florida (Chang, et al., 2012) reported removal of up to 54% of TP, 32% of TN, and 48% of nitrate where the rooting media included Bold & Gold™. Researchers from New Zealand have reported about 40% removal of TSS and suspended Cu (Borne, et al. 2013), and more than 50% removal of TN and TP (White and Cousins, 2013). Researchers sometimes recommend covering 5% or less of stormwater ponds by floating islands, with coverage of less than 5% resulting in lesser pollutant removal effectiveness. Annual maintenance costs are estimated at less than 5% of construction cost. Cost information from Virginia Cooperative Extension Publication BSE-76P (Sample, et al. 2013).

However, floating islands were previously installed and subsequently removed from North Lake at the request of residents. Therefore, this technology may not be recommended for North and South Lake.

5.4 LITTORAL SHELF MODIFICATIONS AND PLANTINGS

Littoral shelf plantings and modifications can limit nutrients and runoff from the adjacent lawns from entering the lake, as well as provide additional nutrient uptake within the lake from the additional littoral shelf plants that are dependent on the available nutrients within the lake targeted for removal. In addition to water quality benefit, littoral shelf modification of the overly steep areas within the banks would provide a safety upgrade for the lake to return the side slopes to a more gradual slope.

Sediment dredged from the lakes can sometimes be used to stabilize eroded shorelines within the lake, as was done on a similar project in Ocean Pines, Maryland where the dredge material from a tidal canal was dredged into geobags and used on the shoreline for stabilization. The dredge material (organic sediment/muck) was pumped directly into the geobags, which were already laid in place on the shoreline. The geobags then dewatered back into the source canal while the muck was contained in the geobags. Eight inches of stone was placed on top of the geobags and capped with articulating concrete block mat at about a 5:1 slope. Some design aspects that were considered were the time of dewatering, as the organic material would take six to nine months to dewater to 90% compaction. To combat this, they placed geotextile material on top of the geobags to run equipment over the bags during construction and provide structural stability for the bags, while still allowing water to dewater from the geobags. They also designed an anchor system to hold the bags in place and provide structural stability, which allowed them to place concrete on unconsolidated dredge material without too much shifting during construction (Gennaro 2005). However, further review of the analytical sediment data from North Lake and South Lake is needed before recommending this technology. Contaminant concentration in sediment shoreline stabilization could potentially cause lasting water quality issues from the leaching of the contaminated sediment.

Littoral shelves not only provide treatment removal efficiencies for TP and TN, they also increase habitat for birds and fishes to thrive. Although littoral shelves provide biological uptake, previous research has indicated that a vast majority of removal processes occur within the Lake rather in the littoral zone vegetation (Harper, 1985; Harper, 1988; and Harper and Herr, 1993). Installation costs for littoral shelves can range from $20,000 to $30,000 per acre.

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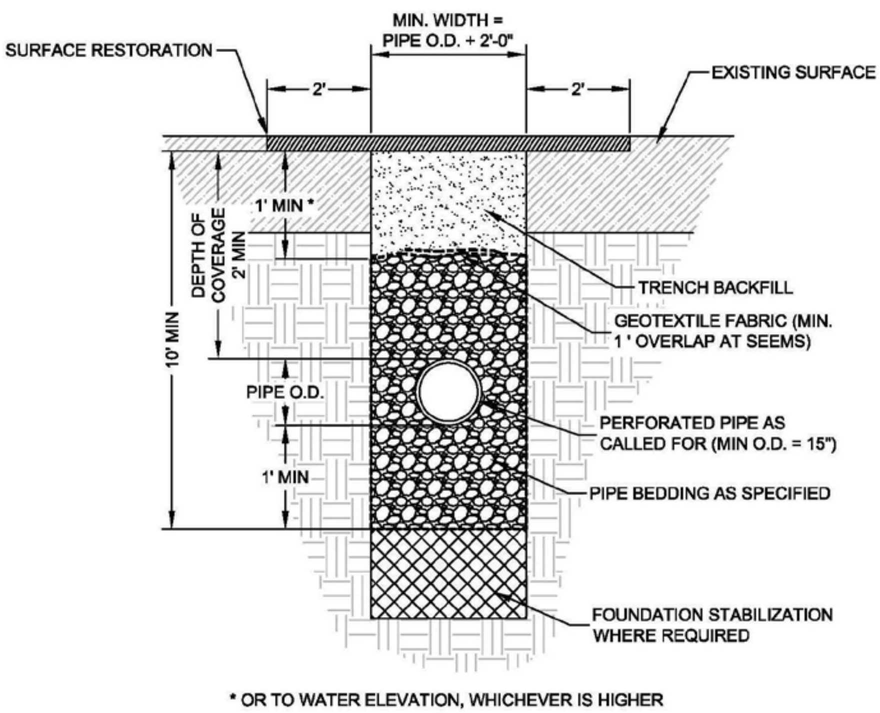
5.5 EXFILTRATION TRENCHES

Exfiltration trenches consist of a subsurface retention system incorporating conduit such as perforated pipe surrounded by natural or artificial aggregate which would temporarily store and allow runoff to percolate into the surrounding soil. Exfiltration trenches promote more efficient infiltration of surface runoff to shallow groundwater tables by detaining stormwater and evenly distributing it throughout the base of the trench. Exfiltration trenches reduce pollutant loads primarily by way of surface runoff volume reduction, however additional reductions in suspended solids, oxygen demanding materials, heavy metals, bacteria, and some varieties of pesticides and nutrients such as phosphorus may be removed as runoff percolates through the soil. Exfiltration trenches can remove 60 to 100% of trace metals, 40 to 80% of TP and 40 to 80% of TN (SFWMD 2002). Installation costs for exfiltration trenches can range from $2.50 to $7.91 per cubic ft of treatment volume.



5.6 NUTRIENT SEPARATING BAFFLE BOXES AND CURB INLET BASKETS

Curb inlet baskets (CIB) are designed to be placed in front of a curb inlet or opening to prevent the migration of sediment into the storm drain system while allowing water to pass through. The filter allows water to temporarily pond behind the inlet which allows deposition of suspended solids. Sediment and soluble pollutants such as phosphorus and petroleum hydrocarbons are filtered from runoff water as it passes through the interior organic media. Other advantages of installing inlet filters include easy maintenance, replacement, and repair.

Nutrient separating baffle box (NSBB) is a structural BMP used for water quality treatment at the outfall of storm drains. The box primarily removes sediment and suspended solids from stormwater. The Type II boxes widely used in South Florida consist of an aluminium screen basket with a horizontal bottom at an elevation below the invert of the influent pipe but above the top of baffles. Incoming flow passes through the screen basket, which captures leaves, trash, and other large materials. In addition to capturing the large sized materials and preventing their passage into the baffle box effluent, the material captured in the screen basket is held above and out of the water column. The purported effect is to reduce or eliminate the leaching that would occur if the captured material were submerged. Since leaching of leaves would release biochemical oxygen demand, nitrogen, and phosphorus, removing leaves from the stormwater and holding the captured leaves out of the water column results in a reduction of nutrient loading to the receiving water body.

An evaluation of NSBB based on Suntree technology generally removes 90% TSS, 20% TN and 19% TP from the water being directed to the system. An evaluation of CIBs removal capacity was performed by the Orange County Lake Management Program and determined from a sample of 250 CIBs units that average annual reductions of 0.20 kilogram per year TN and 0.050 kilogram per year TP could be achieved for each CIB (Dix et al., 2011).

5.7 RAIN GARDENS

Rain gardens are shallow, constructed depressions that are planted with deep-rooted Florida-friendly plants. A rain garden slows down the rush of water from impervious surfaces, holds the water for a short period of time and allows it to naturally infiltrate into the ground. Rain gardens are usually integrated into a site's landscaping to receive runoff from hard surfaces such as a roof, a sidewalk, a driveway, or parking area. Rain gardens offer significant habitat enhancement and aesthetic value while being optimized for stormwater runoff treatment. Rain gardens are among the most effective BMP at removing pollutants from stormwater. Treatment primarily occurs in the root zone and soil media, where nutrients and dissolved pollutants are removed. Site applications of rain gardens include open spaces, parks, golf courses, commercial or industrial developments, and residential developments.

Rain gardens allow approximately 30 percent of runoff to be filtered into the ground. A properly designed rain garden can filter one inch of rainfall in four hours. Rain gardens also filter stormwater pollution, around 90 percent of Cu, lead and zinc; 50 percent of nitrogen; and 65 percent of phosphorus, which could otherwise flow into storm drains and eventually bodies of water (American Society of Landscape Architects, 2018).

5.8 VEGETATED SWALES

Treatment swales are shallow stormwater conveyance channels with vegetation covering the side slopes and bottom. Treatment occurs as runoff flows through the vegetation and infiltrates into the soil matrix. Swales can be designed as part of the stormwater conveyance system and can eliminate the need for some curbs, gutters, and storm drains. They are also well suited to treat runoff from roads and highways because of their linear nature. The treatment effectiveness is correlated to the residence time of the runoff in the swale, and therefore, flow-based swales tend to be considerably longer than other types of treatment BMPs. Site applications of vegetative swales include road shoulders and medians, parking lot islands, open spaces, and parks. Swales can reduce TP by 25%, TN by 10% and TSS by 65% (STEPL, USEPA, 2004). Grass swale installation can cost $0.60 to $1.60 per sq. ft (SFWMD, 2002)

The City of Naples Streets and Stormwater Department is an active partner in the community promoting and providing technical information on the use of treatment swales to reduce runoff volumes and pollutant concentrations into the surrounding Naples Bay and Gulf of Mexico (City of Naples, 2014).

5.9 CAPPING

Capping can be used to encase organic sediments. Capping includes using an excavator to place clean fill to effectively bury the organic-rich sediments and prevent the consumption of oxygen from the water column. Capping can decrease water depth, therefore, waterbodies that are good candidates for capping include those that have a significant amount of organics accumulated on the bottom, but not so significant that the waterbody requires the removal of organics to ensure that stable bathymetry persists. In a canal capping project recommended by WSP, canals with a soft sediment thickness greater than 0.75 feet and water depth greater than 10 feet were considered potentially suitable for capping. To develop a capping recommendation, site-specific information such as percent organic content is used to verify potentially suitable waterbodies. Also, it is recommended that during the project design phase the appropriate gradation of fill material is determined through an evaluation of sediment cores to ensure that gas does not get trapped as the material is placed on the canal bottom.

6 ALTERNATIVES ANALYSIS

As part of the final feasibility analysis, WSP will quantitatively evaluate conceptual BMPs. The below analysis (**Table 5**) provides a preliminary qualitative comparison of each potential BMP type discussed above and the potential site-specific pros and cons for implementation in stormwater lakes in developed urban/residential environments.

Table 65. BMP Technologies Pros vs. Cons.

BMP	Pros	Cons
Primary		
Dredging	Removes the contaminated sediment and provides additional storage for the Lake. Restarts the stormwater lake treatment capabilities at completion of project. No long-term operation and maintenance.	Requires a significant staging area for dewatering. Construction impacts, such as noise, traffic, and aesthetics for the surrounding property owners. Potential high cost for disposal of material based on chemical analysis.
Bio-Augmented Aeration	Low cost to install and minimal staging area restraints for equipment.	Operation impacts, such as noise, and aesthetics for the surrounding property owners. Long term operation and maintenance.
In-Lake		
Floating Islands	High efficiency at pollutant removal and low cost to install and maintain	Routine maintenance required to ensure effectiveness and reduce Lake aesthetics for the surrounding property owners.
Littoral Shelf Modifications and Plantings	High efficiency at pollutant removal and low cost to install and maintain. Provides shoreline stabilization and aesthetics for the surrounding property owners.	Routine maintenance required to ensure effectiveness. If used, geotextile bags filled with Lake sediment have a potential for leeching back into the Lake and causing continued water quality impacts.
In-catchment		
Exfiltration Trenches	High efficiency at pollutant removal and small footprint for implementation.	Routine maintenance required to ensure effectiveness. Limited impact to the watershed and Lake.
Nutrient Separating Baffle Boxes and Curb Inlet Baskets	NSBB high efficiency at pollutant removal and provides educational feature for surrounding community. CIBs small footprint and easy to install.	Routine maintenance required to ensure effectiveness. CIB provide limited impact to watershed and Lake. NSBB high cost and requires modification to stormwater drainage system.
Rain gardens	Provides aesthetics to the surrounding community.	Limited impact to the watershed and Lake. Routine maintenance required to ensure effectiveness.
Vegetated swales	High efficiency at pollutant removal and low cost to install and maintain. The City is already implementing	Limited impact to the watershed and Lake. Need land to provide sufficient storage to provide pollutant removal efficiencies.

BMP	Pros	Cons
	vegetated swales within owned right of ways.	

Further evaluation is needed on the primary technologies for effectiveness, ease to implement, ease of permitting, property owner disruption, time to achieve the restoration, and cost for implementation, and operation, and maintenance. Based on the additional analysis, recommended technologies will subject to an evaluation criterion to rank the technologies by potential for success in improving the water quality associated with the lakes in addition to implementation cost. All criteria will be scored from 0 to 5, with 0 being worse and 5 being best (**Table 6**). Rankings are under development based on continued analysis, including ICPR and BMP Trains modeling.

Table 6. North and South Lakes Potential Technologies Matrix (Preliminary)

Technology	Effectiveness (0-5)	Ease to Implement (0-5)	Permitting (0-5)	Construction Impacts (homeowner disruption) (0 to 5)	Time (0-5)	Cost (0 to 5)	Total	Rank
Primary Technologies (in-Lake)								
Dredging	5	3	5	2	4	3	22	1
Capping	3	4	4	2	4	4	21	2
Secondary Technologies (upstream)								
Curb Inlet Baskets	5	4	5	5	4	5	28	1
Rain Gardens	3	4	4	4	3	4	22	2
Exfiltration Trenches	4	3	4	3	3	4	21	3
Vegetated Swales	2	3	4	4	4	3	20	4
Nutrient Separating Baffle Boxes	5	2	4	4	2	2	19	5
Secondary Technologies (in-Lake)								
Aeration	4	4	4	4	4	4	24	1
Water Control Structure Modifications	4	3	4	3	3	3	20	2
Littoral Shelf Modifications, invasive species removal and plantings	3	2	3	3	3	4	18	3
Floating Islands	2	3	3	2	2	3	15	4
Bio-augmented Aeration	2	2	3	2	2	3	14	5

Notes:

Effectiveness: 5=most effective, 0= least effective

Ease to implement: 5=easiest to implement, 0=most difficult to implement

Permitting: 5=easiest to permit, 0=most difficult to permit

Homeowner Disruption: 5=least homeowner disruption, 0=most homeowner disruption

Time: 5=shortest duration until expected water quality improvements, 0=longest duration until expected water quality improvements

Cost: 5=least expensive, 0=most expensive

Total: sum of scores

Rank: rank based on scores, where highest score is ranked first (1) and lower scores follow.

6.1 SUMMARY

North Lake

In review of the data collection efforts and technology evaluation, North Lake restoration recommendation is shown below:

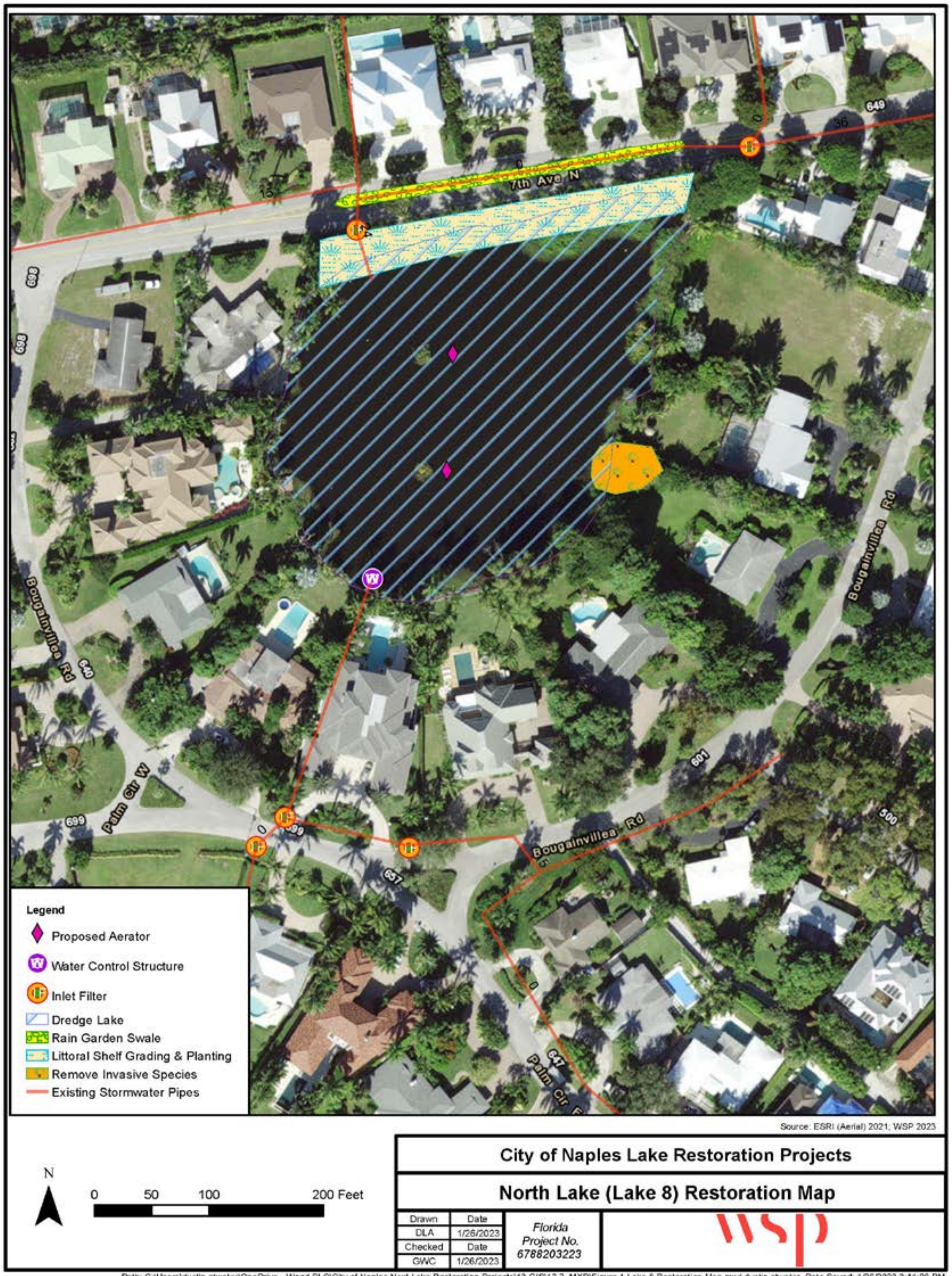
Primary – Dredging to remove unconsolidated sediments which removes contaminants and provide additional storage for stormwater treatment effectiveness.

Secondary

In-Lake - Water Control Structure Modification will provide control to the City to increase retention time during dry season and mean annual events, at the same time this structure will allow for the City to be prepared for large storm events to draw down the lake for flood protection to residents. Littoral Shelf Modifications, invasive species removal, and plantings will provide nutrient uptake effectiveness for the lake. Aeration will provide increased dissolved oxygen concentrations to reduce nutrients and provide for continuous turnover for water quality improvement.

Upstream - Curb inlets will be placed at existing filters to provide trash and sediment capture within the watershed. The rain garden, vegetated swale, and/or exfiltration trench will be evaluated within the existing median to the north of the lake to provide additional stormwater treatment prior to discharging into the lake.

Figure 13. North Lake Restoration Map.



ATTACHMENT A

South Lake

In review of the data collection efforts and technology evaluation, South Lake restoration recommendation is shown below:

Primary – Dredging to remove unconsolidated sediments which removes contaminants and provide additional storage for stormwater treatment effectiveness.

Secondary

In-Lake - Water Control Structure Modification will provide control to the City to increase retention time during dry season and mean annual events, at the same time this structure will allow for the City to be prepared for large storm events to draw down the lake for flood protection to residents. Invasive species removal and plantings will provide nutrient uptake effectiveness for the lake. Aeration will provide increased dissolved oxygen concentrations to reduce nutrients and provide for continuous turnover for water quality improvement.

Upstream - Curb inlets will be placed at existing filters to provide trash and sediment capture within the watershed.

ATTACHMENT A

Figure 14. South Lake Restoration Map

Path: C:\Users\dustin.atwater\OneDrive - Wood PLC\City of Naples Next Lake Restoration Projects\13 GIS\13.2_MXD\Figure 1 Lake 9 Restoration Map.mxd dustin.atwater Date Saved: 1/26/2023 3:08:13 PM

7 FUNDING EVALUATION

Obtaining sufficient project funding is one of the most challenging steps in any restoration project. The focus of this section is to accomplish the following objectives:

- Review and identify the funding opportunities,
- Evaluate the funding needed and the breakdown of cost per parcel based on private vs. public.

The City has several funding options to generate revenue to conduct restorations at North and South Lakes, with varying levels of complexity in procedures to implement. The purpose of generating revenue is a key consideration. The City may:

- Create a Special Tax District, with the support of voters in the watershed: An example of this is the East Naples Bay Special Taxing District established in 1987. Special Tax Districts are similar in function to an MSBU (Municipal Service Benefit Unit), except they require a vote of the impacted property owners. The accounting of the revenue is separate from other funds of like purpose, such as the Stormwater Utility. Providing public education and outreach is critical to assist in informing the impacted electorate of the need, purpose, structure, and impacts of a millage for improvements to the Lakes, both immediate and long-term needs. The State provides guidance on the process and the mandatory elements of the local ordinance to set up a special tax district.
- Create a Special Non-ad valorem Assessment, based on special benefit to property owners in the watershed, referred to as MSBU: Typically, an MSBU does not provide continuous revenue to support long-term operation and maintenance of the Lakes. It distributes the cost of the project to all property owners in the watershed. An assessment role is prepared, on a property-by-property basis. An interest rate is established, providing to each owner a payback period, typically up to six years, but can be up to 20 years.
- Increase Stormwater Utility fees, citywide, to include all lake management maintenance and operational programs: The City's Stormwater Fund may address the cost of project implementation and on-going maintenance by absorbing the cost within the current budget, prioritizing the project within the Capital Improvement Project and on-going maintenance programs and/or increasing current rates citywide.
- Budget capital project needs from City general fund reserves and incorporate continuing maintenance needs into on-going program priorities within the Stormwater Utility, with no rate increase attributable to the North and South Lakes capital project.
- Budget capital project needs from the Stormwater Utility reserves, adding the project to the Utility CIP and implement when enough reserves can be allocated to North and South Lakes.

Loans and grants are another funding option to consider. The Clean Water State Revolving Fund provides low-interest loans to local governments to plan, design, and build or upgrade wastewater, stormwater, and nonpoint source pollution prevention projects. The priority for these funds is heavily targeted to water supply and wastewater management capital needs, with only two stormwater projects identified as priorities in 2019, both from small and/or disadvantaged communities. After research, it was determined that receiving a loan is not a viable option.

WSP has direct experience with obtaining and managing local, state, and federal grant funding for a variety of projects including assisting the City with the Lake Manor South Florida Water Management District (SFWMD) Grant. In addition to the SFWMD grant program offered by the State of Florida, the FDEP administers a funding program, total maximum daily loads to help local governments implement BMPs designed to reduce pollutant loads to impaired waters from urban stormwater runoff.

There are six key considerations WSP uses in evaluating the funding options available.

1. Contribution from Property Owners: Will all property owners contribute revenue with shared responsibility or will the charges to fund the services only be assigned to taxable parcels?

2. Vote of Impacted Property Owners: Is a vote of the property owners within the watershed required? This adds complexity to the process and requires education and outreach to the impacted property owners to provide information on the special election.

3. Public Outreach and Education: Is public support critical to implementation of the capital project and long-term maintenance needs? Outreach must address the ultimate purpose for improving and sustaining the performance of the Lakes over time and motivate people to act.

4. Continuous Revenue Generation: To maintain the Lakes capacity and performance in water quality protection, provide routine maintenance, generate a reserve for future capital needs and dredging and upgrade systems installed, as an on-going component of stormwater operations, requires a revenue that is dedicated and continuous.

5. Capital and Maintenance Program: Is it the City's purpose to address the current conditions of the Lakes and on-going, long-term maintenance? If yes, a program budget is developed and funded annually.

6. Capital Only: Is it the City's purpose to address the current condition of the Lakes? If yes, resources in the Capital Improvement Project (CIP) budget are funded as a one-time cost.

Funding options are not equal in complexity and ease of implementation. The following table provides a comparison of attributes.

Revenue Source	All Properties Contribute	Voter Approval	Public Education	On-going Revenue	Capital and Maintenance	Capital Only
Utility Fees – No Increase*	Yes**	No	Yes	Yes	Yes	Yes
Utility Fees – Citywide	Yes**	No	Yes	Yes	Yes	Yes
Special Tax District	No	Yes	Yes***	Yes	Yes	Yes
Special Assessment District	Yes	No	Yes***	No	No	Yes
General Fund Reserves	No	No	Yes	No	No	Yes
Utility Fund Reserves	Yes	No	Yes	No	No	Yes

* Utility Fees with no increase in rates requires prioritization of the project against other needs funded by the utility and determine when to dredge the Lake based on funding.

** Vacant and undisturbed parcels are exempt from the utility fee if not served by a water meter.

*** Public education is critical during the implementation of a Special Tax District or a Special Assessment District.

If continuous revenue creation to maintain the Lakes in perpetuity is a key driver, a Special Tax District or budget from the Stormwater Utility can sustain revenue growth over decades. If a one-time capital project is the implementation approach, then all methods listed can accomplish the goal.

8 SUMMARY AND NEXT STEPS

To support the restoration of North and South Lakes, WSP conducted data collection and began an evaluation of water quality improvement technologies that may be used in the North Lake and South Lake restoration projects. Traditional methods for removal of highly organic sediments, such as mechanical dredging and hydraulic dredging are commonly used in stormwater lakes and may be recommended at North Lake and South Lake. The removal of highly organic sediments would:

- Reduce the re-release of nutrients stored within the sediments (i.e., reduce internal loading) to the water column and improve the efficiency of treatment of nutrient-rich stormwater inputs.
- Reduce the potential for dissolved oxygen depletion that can produce objectionable odors and potential fish kills.
- Increase the depth and storage capacity of the lake to improve its flood mitigation effectiveness
- Increase the residence time of water in the lake which should improve effectiveness of North Lake and South Lake in removing stormwater pollutants including TSS, TN, and TP, and improve water quality in discharges to Alligator Lake and ultimately the Gulf of Mexico.

The recommended removal methodology will be dependent on the thickness, consistency, and characteristics of the highly organic sediment material. Mechanical dredging requires heavy equipment and would not be efficient in removing fine organic sediment. Mechanical dredging also requires a large footprint for dewatering since the material needs ample time to dry for hauling to a disposal area. Hydraulic dredging is a relatively low impact method of sediment removal with few effects on the surrounding environmental system.

Other design elements for North and South Lakes and their watersheds to reduce downstream loadings of pollutants of concern and improve water quality have been reviewed for implementation. These could include littoral shelves, enclosed sediment sumps or catch basins at stormwater inlets/inflows to remove trash and debris prior to entering the infrastructure system, rain gardens in open spaces within the basin (either in public right of ways or in homeowner areas), and baffles projecting from the lake bank into the lake to increase retention time. Public involvement, including nearby residents, will also be important to the implementation and success of the North and South Lakes improvements. One of the biggest challenges for this project will be coordination with the public and designing an efficient dewatering system that can minimize disturbance to the surrounding community. Public involvement would need to include an outreach program involving agency coordination and outreach to the media, businesses, community groups, and the general public using appropriate methods and tools to solicit input and provide details on the project. The outreach program would also include mailers (flyers) directed at elected officials, agencies, property owners and tenants to announce public information meetings and provide information about the project.

ATTACHMENT A

BIBLIOGRAPHY

AECOM, 2018. City of Naples 2018 Stormwater Master Plan Update.

Amec. 2012. City of Naples Stormwater Quality Analysis, Pollutant Loading and Removal Efficiencies.

Amec. 2013. City of Naples Semi-Annual and Quarterly Stormwater Infrastructure Monitoring Final Report, January 2013.

Amec. 2014. City of Naples Semi-Annual and Quarterly Stormwater Infrastructure Monitoring Final Report, March 2014.

American Society of Landscape Architects, 2018. Improving Water Efficiency: Residential Rain Gardens. Website: https://www.asla.org/raingardens.aspx

Borne, K.E., E.A. Fassman, Chris C. Tanner. 2013. Floating treatment wetland retrofit to improve stormwater pond performance for suspended solids, copper and zinc. Ecological Engineering 54:173– 182.

Cardno Quarterly Stormwater Sampling Results, 2015 – 2018 (Cardno).

Chang, N.B., M.K. Islam, and M.P. Wanielista. 2012. Floating wetland mesocosm assessment of nutrient removal to reduce ecotoxicity in stormwater ponds. Int. J. Environ. Sci. Technol. 9:453–462.

City of Naples. 2012. City of Naples, Stormwater Lakes Maintenance & Restoration Plan, March 2012.

City of Naples, 2014. City of Naples, City Swales, Website: https://www.naplesgov.com/sites/default/files/Archives/Stormwater/swales%20%20_201407151345403680.pdf

City of Naples. 2013. Comprehensive Plan Updated 12-3-2013. Website: http://www.napleshistoricalsociety.org/pdfs/2016files/City%20of%20Naples%20Comprehensive%20Plan.pdf

Dix, N., R. Novy, B. Catanzaro. 2011. An Evaluation of Curb and Grate Inlet Baskets: Quantification of Nutrient Removal and Associated Costs in Orange County, FL. Orange County Lake Management Program. November 2011.

Florida Department of Environmental Protection (FDEP), 2005. Memorandum from Mike Sole, Director Division of Waste Management. Subject: Guidance for the Management of Street Sweepings, Catch Basin Sediments and Stormwater System Sediments. Florida Gulf Coast University (FGCU), Bathymetry and Sediment Characterization of Spring Lake, February 2013.

Florida Gulf Coast University (FGCU). 2013. Bathymetry and Sediment Characterization of Spring Lake, February 2013.

Fritz, Angela and Miller, B. CNN. September 2022. “Hurricane Ian’s rainfall was a 1-in-1,000 year event for the hardest-hit parts of Florida”, available at https://www.cnn.com/2022/09/29/weather/hurricane-ian-1000-year-rainfall-climate/index.html (accessed 12/8/2022)

Gennaro, Nicholas De. 2005. Beneficial Uses of Dead-End Canal Dredging in Combination with Special Use Materials for Erosion Control.

Harper, H. H. 1985. Fate of heavy metals from highway runoff in stormwater management systems (Doctoral dissertation, University of Central Florida).

Harper, H.H., 1988. Effects of stormwater management systems on groundwater quality. *Final report. Contract WM-190. Submitted to the Florida Department of Environmental Regulation, Tallahassee, FL.*

Harper, H.H., and Herr, J.L. August 1993. “Treatment Efficiency of Detention with Filtration Systems.” Final Report to the St. Johns River Water Management District.

Iowa State University Environmental Mesonet, “National Weather Service Raw Text Product”, available at https://mesonet.agron.iastate.edu/wx/afos/p.php?pil=PSHMFL&e=202210141556 (accessed 12/8/2022)

Kiaghadi, A., Rifai, H.S., Crum, M. and Willson, R.C., 2022. Longitudinal patterns in sediment type and quality during daily flow regimes and following natural hazards in an urban estuary: a Hurricane Harvey retrospective.

Environmental Science and Pollution Research, 29(5), pp.7514-7531.MACTEC, 2008. Spring Lake Report of Surface Water and Sediment Testing in Naples, Collier County, Florida.

NOAA National Centers for Environmental Information, Monthly National Climate Report for September 2022, published online October 2022, retrieved on December 8, 2022 from https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202209/supplemental/page-5.

NOAA National Environmental Satellite Data and Information Service, "Hurricane Ian's Path of Destruction", available at https://www.nesdis.noaa.gov/news/hurricane-ians-path-of-destruction (accessed 12/8/2022)

Ogdahl, Mary E., Alan D. Steinman, and Maggie E. Weinert. "Laboratory-determined phosphorus flux from lake sediments as a measure of internal phosphorus loading." JoVE (Journal of Visualized Experiments) 85 (2014): e51617.

Sabatier, P., Moernaut, J., Bertrand, S., Van Daele, M., Kremer, K., Chaumillon, E. and Arnaud, F., 2022. A review of event deposits in lake sediments. Quaternary, 5(3), p.34.

Sample, D.J, C-Y Wang, and L.J. Fox. 2013. Innovative Best Management Fact Sheet No. 1: Floating Treatment Wetlands. Virginia Cooperative Extension Publication BSE-76P.

SFWMD, 2002. Best Management Practices for South Florida Urban Stormwater Management Systems

US Environmental Protection Agency (USEPA). 2004. Spreadsheet Tool for the Estimation of Pollutant Load (STEPL, version 3.0).

Wanielista, M. 2020. *User Manual - BMP Trains.* University of Central Florida, Stormwater Management Academy. Orlando: University of Central Florida. Retrieved from https://stars.library.ucf.edu/bmptrains/25/

White, S.A., and M.M. Cousins. 2013. Floating treatment wetland aided remediation of nitrogen and phosphorus from simulated stormwater runoff. Ecological Engineering 61:207–215.

Yao, Q., Liu, K.B., Williams, H., Joshi, S., Bianchette, T.A., Ryu, J. and Dietz, M., 2020. Hurricane Harvey storm sedimentation in the San Bernard national wildlife refuge, Texas: Fluvial versus storm surge deposition. Estuaries and Coasts, 43(5), pp.971-983.

A TITLE

ATTACHMENT A

A-1 *TITLE*

ATTACHMENT A

APPENDIX

A

ECOLOGICAL EVALUATION DOCUMENTATION

ATTACHMENT A

PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
North Lake	TBD	

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
3220	N/A	TBD	1.76 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
HUC 03090204	N/A	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The project area is used as a stormwater lake and discharges into South Lake, then discharges into Alligator Lake before discharing into the Gulf of Mexico via beach outfall 6.

Assessment area description

The proposed area is surrounded by medium density residential dwellings and roadways with minimal adjacent habitat. It is used as stormwater retention and receives a significant amount of stormwater runoff from the adjacent roadways and residential development. The site is dominated by *Alternathera philoxeroides* and *Ludwigia peruviana* and had less than 5% of desirable species. About two-thirds of the site was covered by *Lemna sp.* at the time of the assessment.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential properties and streets.	The subject area is fairly common in the region.

Functions	Mitigation for previous permit/other historic use
The existing waterbody functions as stormwater retention.	No.

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various wading birds and fishes.	Wood stork (T), foraging and wading, low use.

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Muscovy ducks, snook, snowy egret, moorhen, and mosquitofish.

Additional relevant factors:

N/A

Assessment conducted by:	Assessment date(s):
Erik Oij/ Genevieve Patrick	9/1/2022

ATTACHMENT A

PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
North Lake	TBD	
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
TBD	Erik Oij/ Genevieve Patrick	9/1/2022

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	4	0	The site is surrounded by medium density residential development and paved roadways. There is minimal adjacent habitat. The site may be utilized as a source of freshwater for species in the immediate area.
.500(6)(b)Water Environment (n/a for uplands)	4	0	Water quality at this site is poor. The lake is used as stormwater retention and receives a significant amount of stormwater runoff from the adjacent roadways and residential development. Evidence of eutrophication is present, likely due to fertilizer runoff from the adjacent properties.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	2	0	The littoral edge is maintained and mowed. Invasive species make up the majority of the vegative community stucture with some isolated patches of native vegetation. There are no shrubs or trees present. There is minimal SAV within the lake. The site is dominated by *Alternathera philoxeroides* and *Ludwigia peruviana* and had less than 5% of desirable species. About two-thirds of the site was covered by *Lemna sp.* at the time of the assessment.

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PART I – Qualitative Description
(See Section 62-345.400, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
South Lake	TBD	

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size
3220	N/A	TBD	4.35 acres

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)
HUC 03090204	N/A	N/A

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

The project area is used as a stormwater lake and discharges into into Alligator Lake before discharing into the Gulf of Mexico via beach outfall 6.

Assessment area description

The proposed area is surrounded by medium density residential dwellings and roadways with minimal adjacent habitat. It is used as stormwater retention and receives a significant amount of stormwater runoff from the adjacent roadways and residential development.The site is dominated by *Alternathera philoxeroides.* During the site assessment, the water had a blue tint likely due to an additive and a film on the water surface.

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape.)
Residential properties and streets.	The subject area is fairly common in the region.

Functions	Mitigation for previous permit/other historic use
The existing waterbody functions as stormwater retention.	No.

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found)	Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Various wading birds and fishes.	N/A

Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):

Moorhen, little green heron, mosquitofish, blue jay, crow, great egret, white ibis, muscovy duck, mocking bird.

Additional relevant factors:

N/A

Assessment conducted by:	Assessment date(s):
Erik Oij/ Genevieve Patrick	9/1/2022

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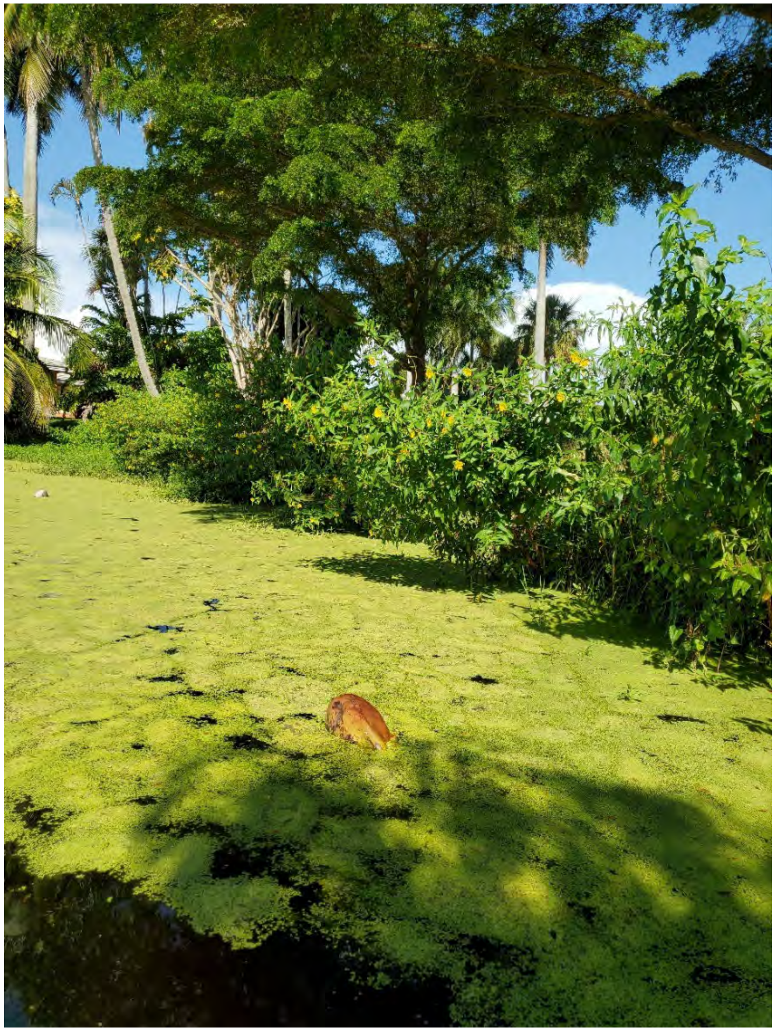
PART II – Quantification of Assessment Area (impact or mitigation)
(See Sections 62-345.500 and .600, F.A.C.)

Site/Project Name	Application Number	Assessment Area Name or Number
South Lake	TBD	
Impact or Mitigation	**Assessment conducted by:**	**Assessment date:**
TBD	Erik Oij/ Genevieve Patrick	9/1/2022

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface waterfunctions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Indicator	w/o pres or current	with	Description
.500(6)(a) Location and Landscape Support	4	0	The site is surrounded by medium density residential development and paved roadways. There is minimal adjacent habitat. The site may be utilized as a source of freshwater for species in the immediate area.
.500(6)(b)Water Environment (n/a for uplands)	4	0	Water quality at this site is poor and has a blue tint to it likely due to an additive. During the site assessment, there was a film on the water surface. The lakes are used as stormwater retention and receive a significant amount of stormwater runoff from the adjacent roadways and residential development. Evidence of eutrophication is present, likely due to fertilizer runoff from the adjacent properties.
.500(6)(c)Community structure 1. Vegetation and/or 2. Benthic Community	2	0	The littoral edge is maintained and mowed with a steep slope. Invasive species make up the majority of the vegative community stucture with some isolated patches of native vegetation. There are no shrubs or trees present. There is minimal SAV within the lake. The site is dominated by *Alternathera philoxeroides* .

ATTACHMENT A



Photograph 1 – North Lake
Alternathera philixeroides and *Ludwigia peruviana* with heavy *Lemna sp.* cover.

Photograph 2 – North Lake
Alternathera philixeroides with *Lemna sp.* present in front of culvert.

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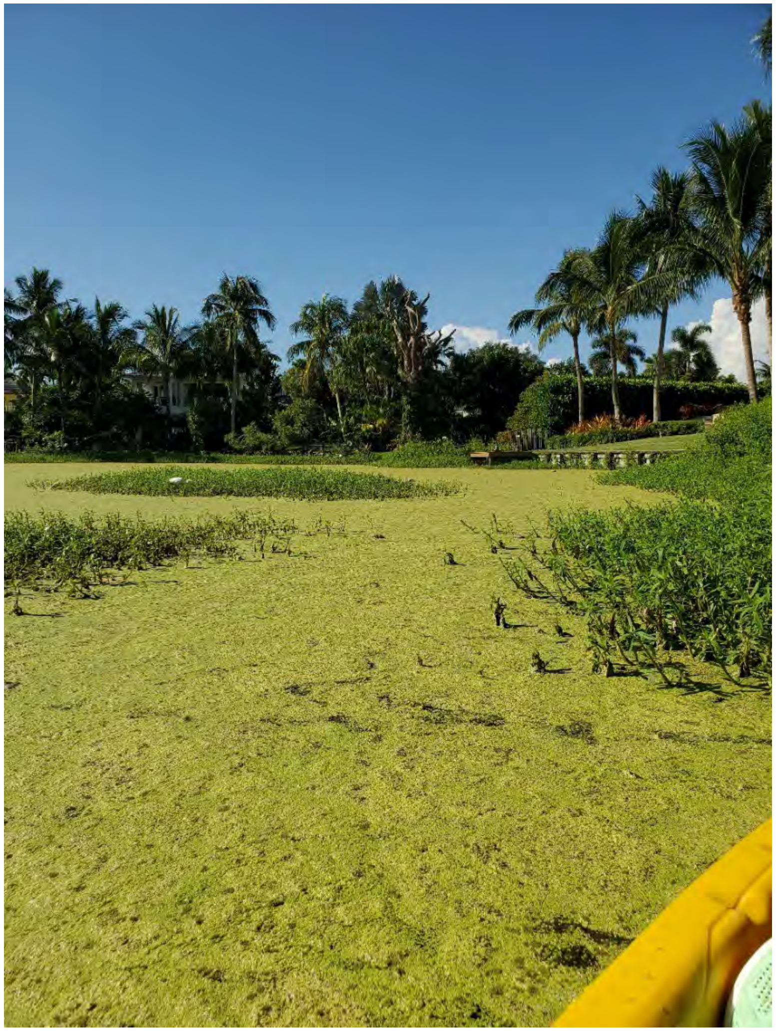
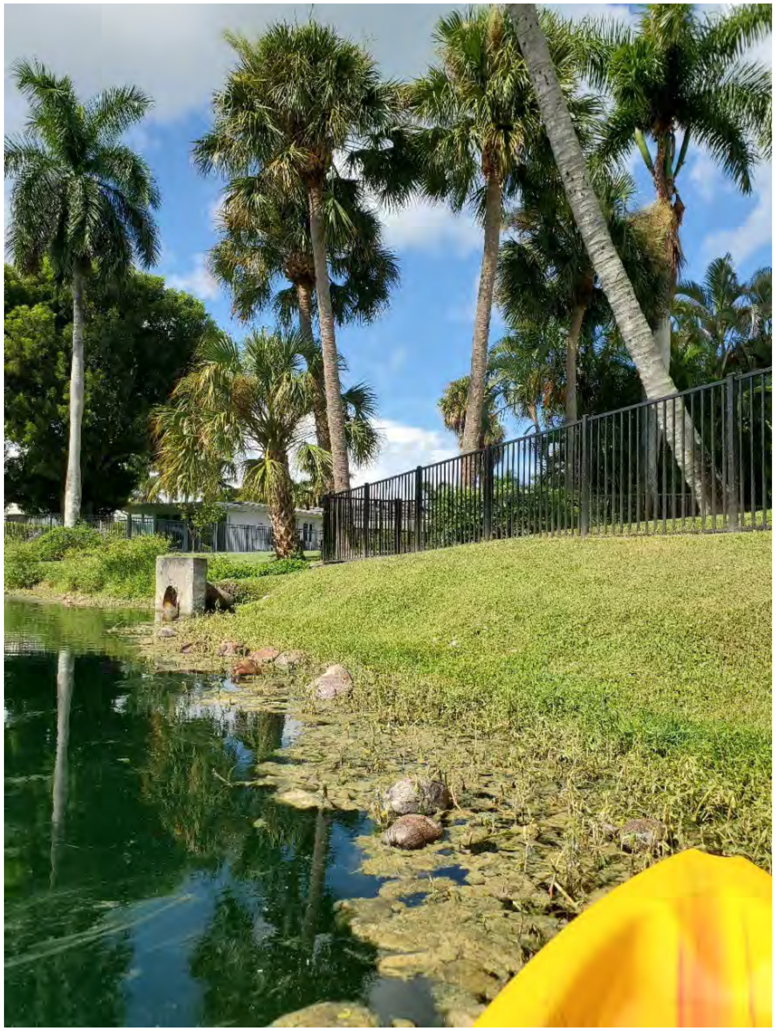


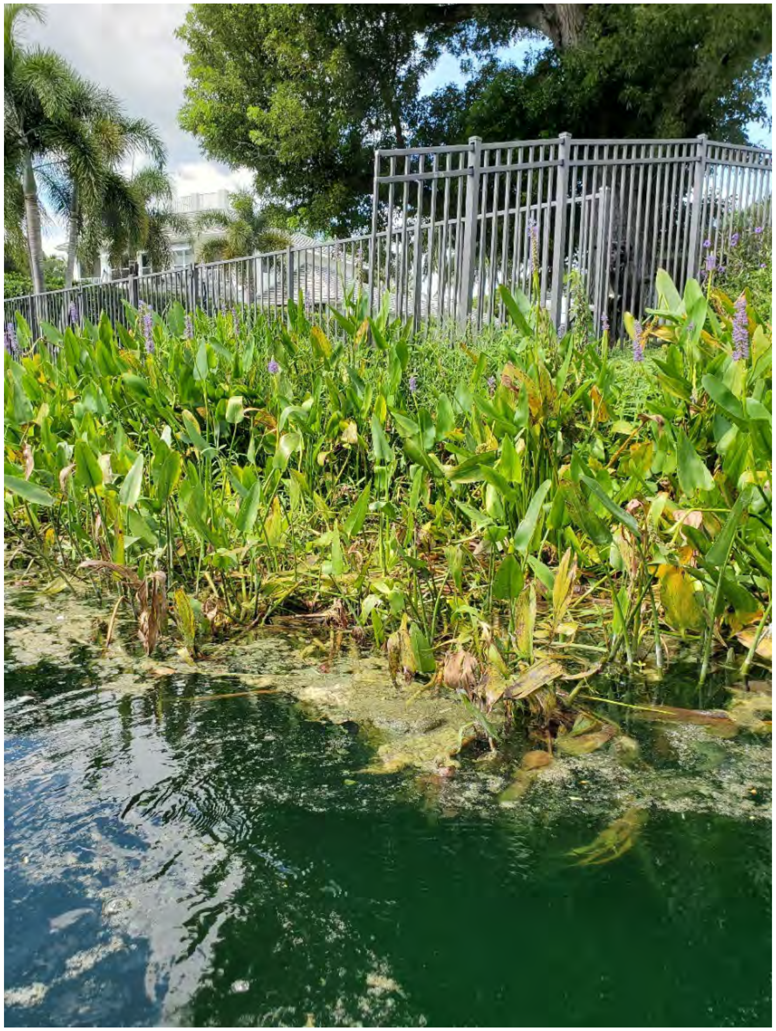
Photograph 3 – North Lake
Lemna sp. and *Alternathera philixeroides* covered most of the North Lake.

Photograph 4 – North Lake
Schinus tereninthifolia is present in the background of this photo with *Alternathera philixeroides* and *Lemna sp.* in the foreground.

Photograph 7 – South Lake
Cypress stumps along littoral edge.



Photograph 8 – South Lake
Maintained, mowed lawn of residential property along the littoral edge.

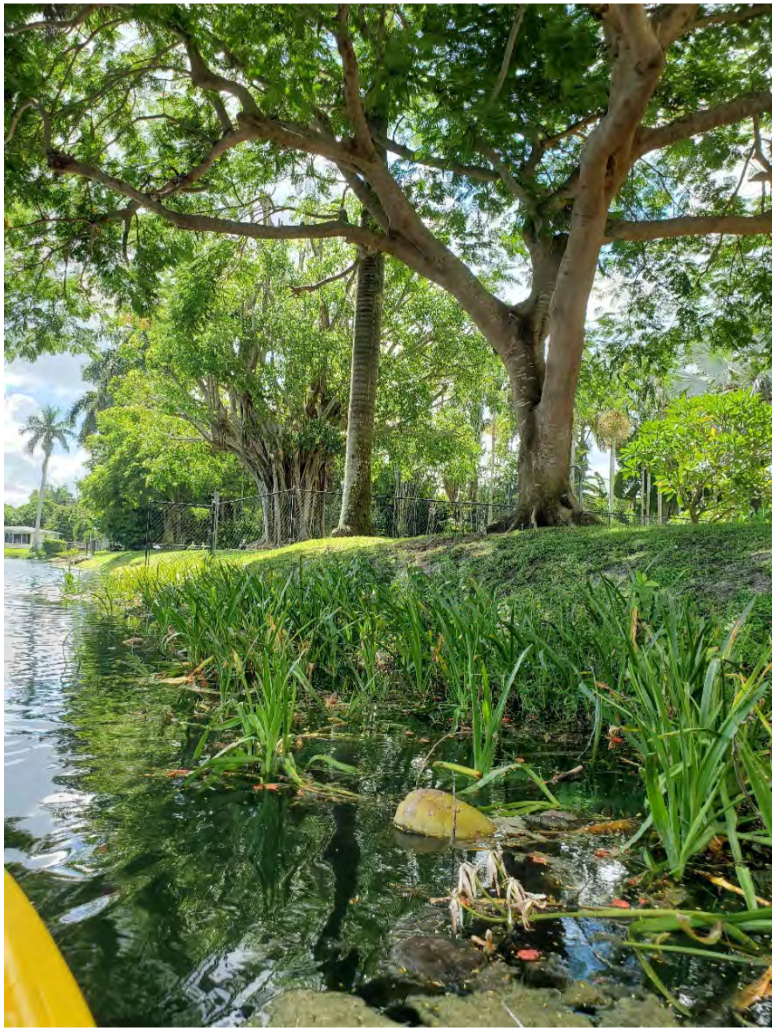


Photograph 9 – South Lake
Pontederia cordata present.

Photograph 10 – South Lake
Many lawns were maintained to the littoral edge with large slopes.

Photograph 11 – South Lake
Pontederia cordata with riprap along littoral edge.

Photograph 12 – South Lake
Ludwigia peruviana and *Alternathera philixeroides* present along littoral edge.



Photograph 13 – South Lake
Crinum Americanum present along littoral edge.

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Florida Natural Areas Inventory

Biodiversity Matrix Query Results

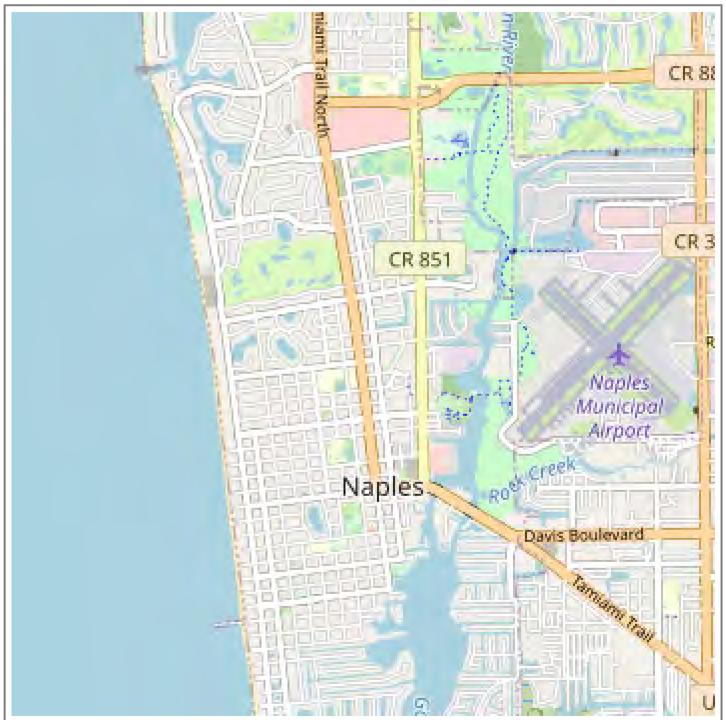
UNOFFICIAL REPORT

Created 8/30/2022

(Contact the FNAI Data Services Coordinator at 850.224.8207 or kbrinegar@fnai.fsu.edu for information on an official Standard Data Report)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 38703



Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 38703

1 **Documented** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Anax amazili Amazon Darner	G5	S2	N	N

1 **Documented-Historic** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Haliaeetus leucocephalus Bald Eagle	G5	S3	N	N

2 **Likely** Elements Found

Scientific and Common Names	Global	State	Federal	State

	Rank	Rank	Status	Listing
Sciurus niger avicennia Big Cypress Fox Squirrel	G5T2	S2	N	ST
Stylisma abdita scrub stylisma	G3	S3	N	E

Matrix Unit ID: 38703

25 **Potential** Elements for Matrix Unit 38703

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Acipenser oxyrinchus desotoi Gulf Sturgeon	G3T2T3	S2?	T	FT
Ardea herodias occidentalis Great White Heron	G5T2	S2	N	N
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	ST
Crocodylus acutus American Crocodile	G2	S2	T	FT
Drymarchon couperi Eastern Indigo Snake	G3	S2?	T	FT
Dryobates borealis Red-cockaded Woodpecker	G3	S2	E, PT	FE
Eragrostis pectinacea var. tracyi Sanibel lovegrass	G5T1	S1	N	E
Eretmochelys imbricata Hawksbill Sea Turtle	G3	S1	E	FE
Eumops floridanus Florida bonneted bat	G1	S1	E	FE
Gopherus polyphemus Gopher Tortoise	G3	S3	C	ST
Gymnopogon chapmanianus Chapman's skeletongrass	G3	S3	N	N
Lechea cernua nodding pinweed	G3	S3	N	T
Linum carteri var. smallii Small's flax	G2T2	S2	N	E
Lithobates capito Gopher Frog	G2G3	S3	N	N
Nemastylis floridana celestial lily	G2	S2	N	E
Nolina atopocarpa Florida beargrass	G3	S3	N	T
Patagioenas leucocephala White-crowned Pigeon	G3	S3	N	ST
Pteroglossaspis ecristata giant orchid	G2G3	S2	N	T
Rallus longirostris scottii Florida Clapper Rail	G5T3?	S3?	N	N
Rivulus marmoratus Mangrove Rivulus	G4G5	S3	SC	N
Rostrhamus sociabilis Snail Kite	G4G5	S2	E	FE
Roystonea regia Florida royal palm	G2G3	S2	N	E
Setophaga discolor paludicola Florida Prairie Warbler	G5T3	S3	N	N
Trichechus manatus latirostris Florida Manatee	G2G3T2	S2S3	T	N
Ursus americanus floridanus Florida Black Bear	G5T4	S4	N	N

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Collier County, Florida

Local office

Florida Ecological Services Field Office

✉ fw4flesregs@fws.gov

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Florida Bonneted Bat Eumops floridanus Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/8630	Endangered
Florida Panther Puma (=Felis) concolor coryi Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1763	Endangered
Puma (=mountain Lion) Puma (=Felis) concolor (all subsp. except coryi) No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6049	SAT
West Indian Manatee Trichechus manatus Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Audubon's Crested Caracara Polyborus plancus audubonii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8250	Threatened
Eastern Black Rail Laterallus jamaicensis ssp. jamaicensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10477	Threatened

Piping Plover Charadrius melodus — Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/6039

Red Knot Calidris canutus rufa — Threatened
Wherever found

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/1864

Wood Stork Mycteria americana — Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8477

Reptiles

NAME	STATUS
American Alligator Alligator mississippiensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/776	SAT
American Crocodile Crocodylus acutus There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6604	Threatened
Eastern Indigo Snake Drymarchon couperi Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/646	Threatened
Green Sea Turtle Chelonia mydas There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6199	Threatened
Loggerhead Sea Turtle Caretta caretta There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1110	Threatened

Fishes

NAME	STATUS
Gulf Sturgeon Acipenser oxyrinchus (=oxyrhynchus) desotoi Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/651	Threatened

Insects

NAME	STATUS
Bartram's Hairstreak Butterfly Strymon acis bartrami Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4837	Endangered
Florida Leafwing Butterfly Anaea troglodyta floridalis Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6652	Endangered
Miami Blue Butterfly Cyclargus (=Hemiargus) thomasi bethunebakeri Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3797	Endangered

Flowering Plants

NAME	STATUS
Florida Prairie-clover Dalea carthagenensis floridana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2300	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

American Kestrel Falco sparverius paulus — Breeds Apr 1 to Aug 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9587

American Oystercatcher Haematopus palliatus — Breeds Apr 15 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8935

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Blue Heron Ardea herodias occidentalis — Breeds Jan 1 to Dec 31

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Magnificent Frigatebird Fregata magnificens — Breeds Oct 1 to Apr 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Reddish Egret Egretta rufescens — Breeds Mar 1 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7617

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Swallow-tailed Kite Elanoides forficatus — Breeds Mar 10 to Jun 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8938

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Plover Charadrius wilsonia — Breeds Apr 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

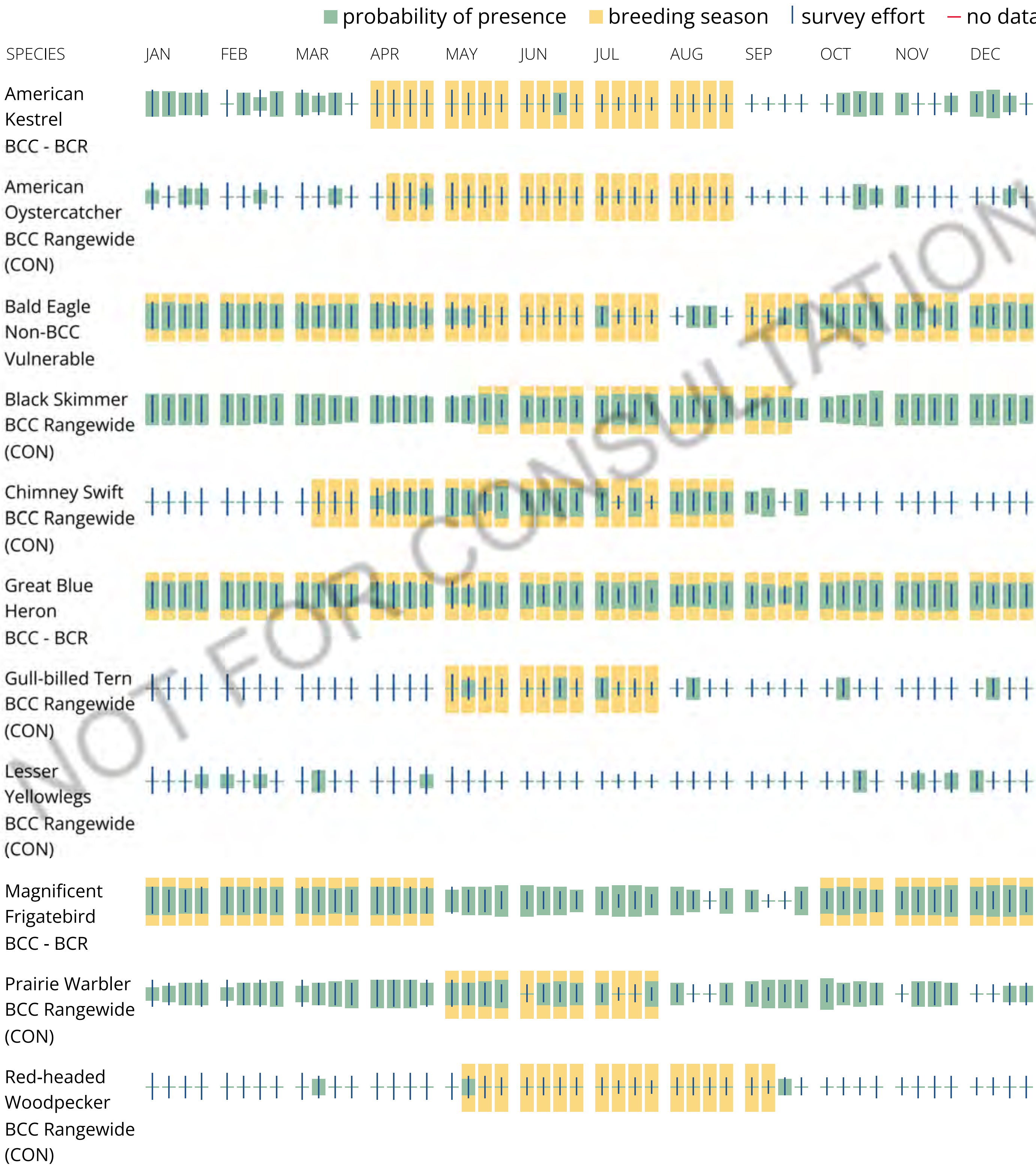
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

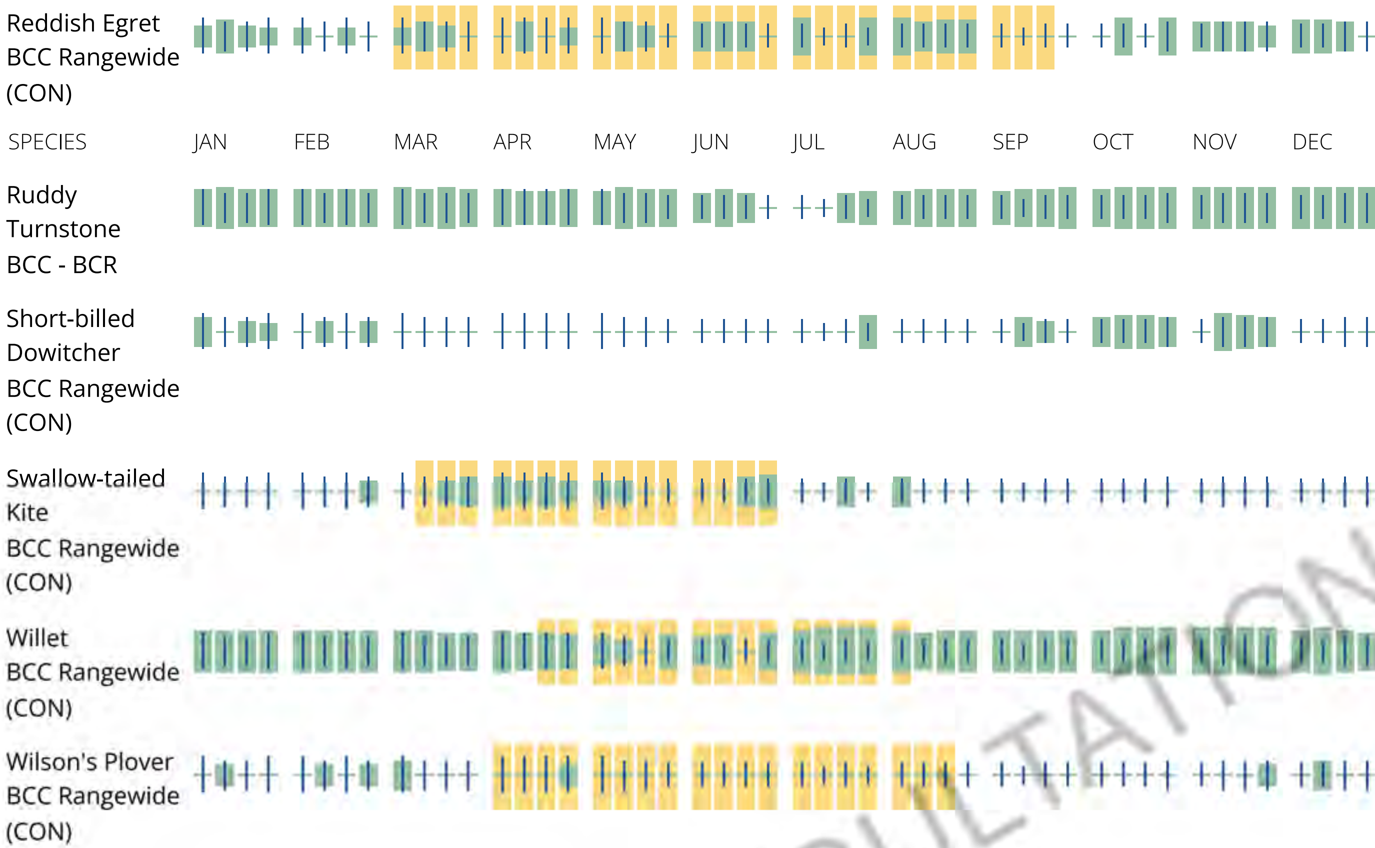
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact

Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA

Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Wetland information is not available at this time

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Collier County, Florida

Local office

Florida Ecological Services Field Office

✉ fw4flesregs@fws.gov

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Florida Bonneted Bat Eumops floridanus Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/8630	Endangered
Florida Panther Puma (=Felis) concolor coryi Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1763	Endangered
Puma (=mountain Lion) Puma (=Felis) concolor (all subsp. except coryi) No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6049	SAT
West Indian Manatee Trichechus manatus Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4469	Threatened Marine mammal

Birds

NAME	STATUS
Audubon's Crested Caracara Polyborus plancus audubonii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8250	Threatened
Eastern Black Rail Laterallus jamaicensis ssp. jamaicensis Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10477	Threatened

Piping Plover *Charadrius melodus* There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* Wherever found There is **proposed** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1864	Threatened
Wood Stork *Mycteria americana* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8477	Threatened

Reptiles

NAME	STATUS
American Alligator *Alligator mississippiensis* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/776	SAT
American Crocodile *Crocodylus acutus* There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6604	Threatened
Eastern Indigo Snake *Drymarchon couperi* Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/646	Threatened
Green Sea Turtle *Chelonia mydas* There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6199	Threatened
Loggerhead Sea Turtle *Caretta caretta* There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/1110	Threatened

Fishes

NAME	STATUS
Gulf Sturgeon Acipenser oxyrinchus (=oxyrhynchus) desotoi Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/651	Threatened

Insects

NAME	STATUS
Bartram's Hairstreak Butterfly Strymon acis bartrami Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/4837	Endangered
Florida Leafwing Butterfly Anaea troglodyta floridalis Wherever found There is **final** critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/6652	Endangered
Miami Blue Butterfly Cyclargus (=Hemiargus) thomasi bethunebakeri Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3797	Endangered

Flowering Plants

NAME	STATUS
Florida Prairie-clover Dalea carthagenensis floridana No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2300	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON

American Kestrel Falco sparverius paulus — Breeds Apr 1 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9587

American Oystercatcher Haematopus palliatus — Breeds Apr 15 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8935

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5234

Chimney Swift Chaetura pelagica — Breeds Mar 15 to Aug 25
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Great Blue Heron Ardea herodias occidentalis — Breeds Jan 1 to Dec 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9501

Lesser Yellowlegs Tringa flavipes — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9679

Magnificent Frigatebird Fregata magnificens — Breeds Oct 1 to Apr 30
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Red-headed Woodpecker Melanerpes erythrocephalus — Breeds May 10 to Sep 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Reddish Egret Egretta rufescens — Breeds Mar 1 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/7617

Ruddy Turnstone Arenaria interpres morinella — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Swallow-tailed Kite Elanoides forficatus — Breeds Mar 10 to Jun 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8938

Willet Tringa semipalmata — Breeds Apr 20 to Aug 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wilson's Plover Charadrius wilsonia — Breeds Apr 1 to Aug 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

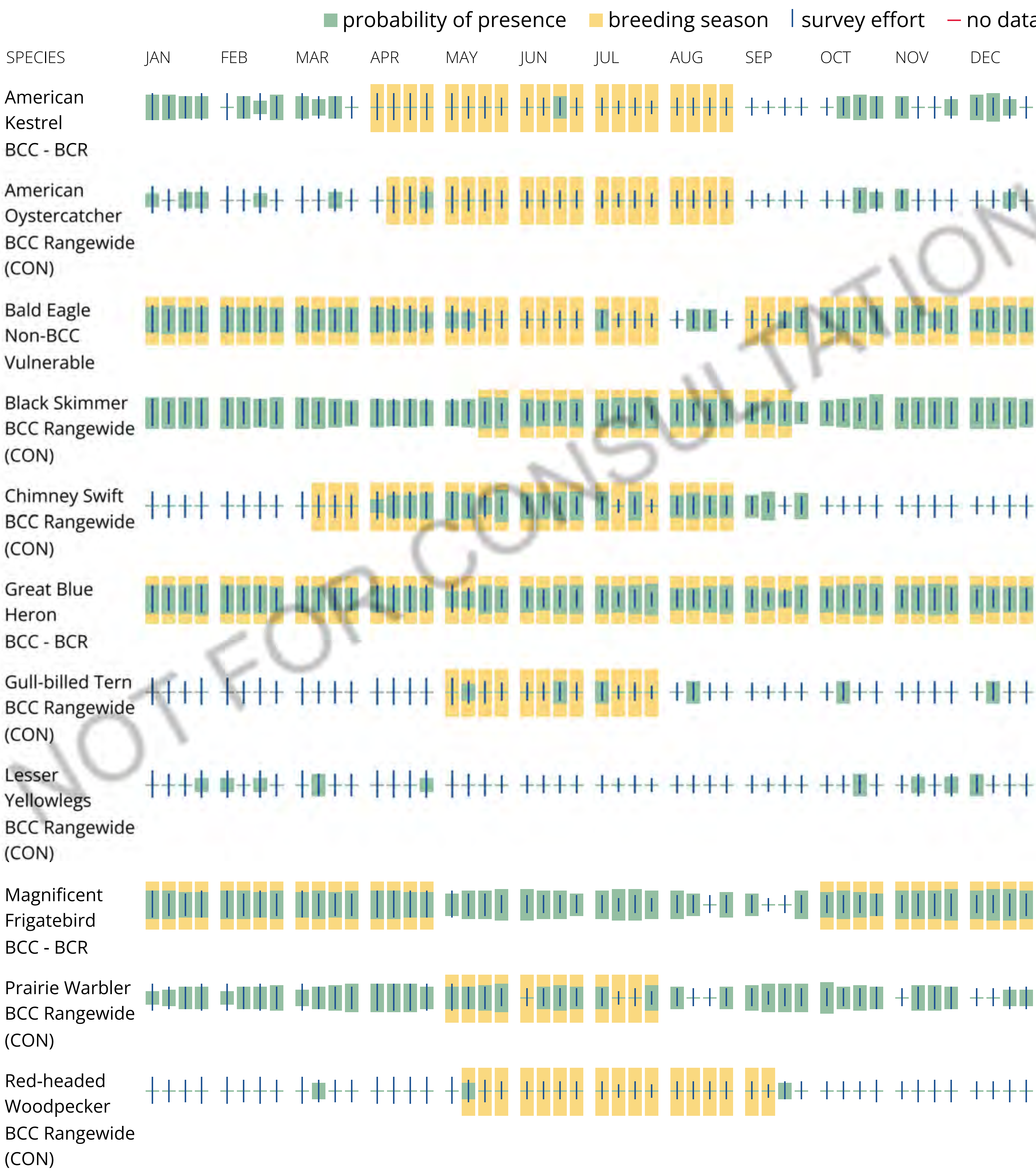
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

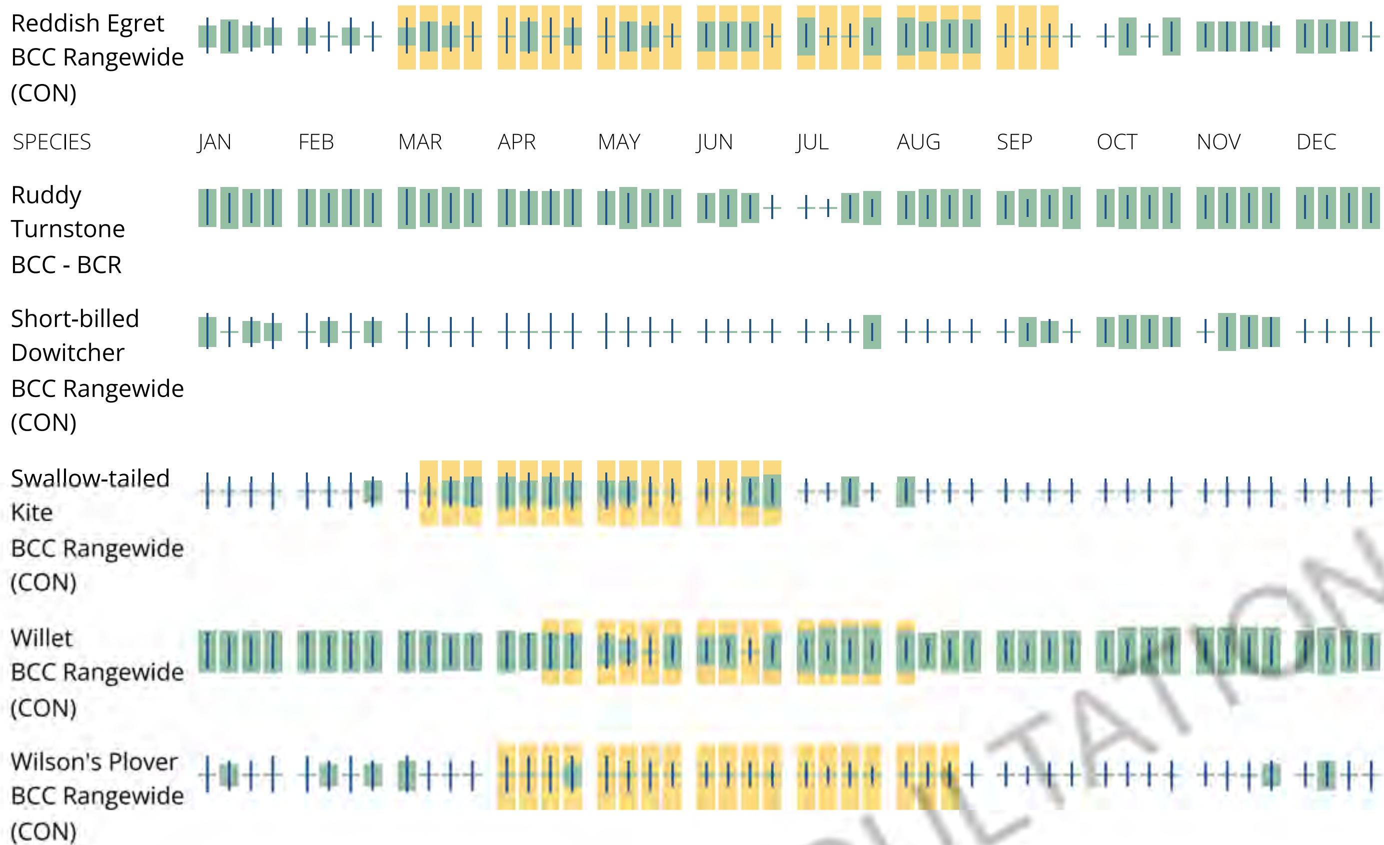
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact

Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
https://ecos.fws.gov/ecp/species/4469

Coastal Barrier Resources System

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA

Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

There are no known coastal barriers at this location.

Data limitations

The CBRS boundaries used in IPaC are representations of the controlling boundaries, which are depicted on the official CBRS maps. The boundaries depicted in this layer are not to be considered authoritative for in/out determinations close to a CBRS boundary (i.e., within the "CBRS Buffer Zone" that appears as a hatched area on either side of the boundary). For projects that are very close to a CBRS boundary but do not clearly intersect a unit, you may contact the Service for an official determination by following the instructions here: https://www.fws.gov/service/coastal-barrier-resources-system-property-documentation

Data exclusions

CBRS units extend seaward out to either the 20- or 30-foot bathymetric contour (depending on the location of the unit). The true seaward extent of the units is not shown in the CBRS data, therefore projects in the offshore areas of units (e.g., dredging, breakwaters, offshore wind energy or oil and gas projects) may be subject to CBRA even if they do not intersect the CBRS data. For additional information, please contact CBRA@fws.gov.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER POND

Palustrine

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

ATTACHMENT A

APPENDIX

B

SEDIMENT CORING LABORATORY REPORTS

ATTACHMENT A

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

December 08, 2022

Greg Corning
WSP USA Environment & Infrastructure Inc.
5845 NW 158th Street
Hialeah, FL 33014

RE: Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Dear Greg Corning:

Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Ormond Beach

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Neshmah Castaneda
neshmah.castaneda@pacelabs.com
(386)672-5668
Project Manager

Enclosures

cc: Ash Aitharaju, WSP USA Environment & Infrastructure Inc.

Pace Analytical Services, LLC
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CERTIFICATIONS

Project:	City of Naples Lake Restoratio
Pace Project No.:	35760275

Pace Analytical Services Ormond Beach

8 East Tower Circle, Ormond Beach, FL 32174
Alaska DEC- CS/UST/LUST
Alabama Certification #: 41320
Colorado Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maine Certification #: FL01264
Maryland Certification: #346
Massachusetts Certification #: M-FL1264
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Ohio DEP 87780
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

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SAMPLE SUMMARY

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35760275001	**LAKE 9 Comp 134**	Solid	11/14/22 09:10	11/16/22 15:00
35760275002	**LAKE 9 Comp 256**	Solid	11/14/22 10:00	11/16/22 15:00
35760275003	**LAKE 9 Comp 8 11 12 14**	Solid	11/14/22 11:00	11/16/22 15:00
35760275004	**LAKE 9 Comp 17 18 20 21**	Solid	11/14/22 13:05	11/16/22 15:00
35760275005	**LAKE 9 Comp 15 16 19 22**	Solid	11/14/22 14:20	11/16/22 15:00
35760275006	**LAKE 9 Comp 7 9 10 13**	Solid	11/14/22 15:20	11/16/22 15:00
35760275007	**LAKE 8 Comp 137**	Solid	11/15/22 09:20	11/16/22 15:00
35760275008	**LAKE 8 Comp 248**	Solid	11/15/22 10:15	11/16/22 15:00
35760275009	**LAKE 8 Comp 659**	Solid	11/15/22 11:45	11/16/22 15:00

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SAMPLE ANALYTE COUNT

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35760275001	**LAKE 9 Comp 134**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275002	**LAKE 9 Comp 256**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275003	**LAKE 9 Comp 8 11 12 14**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275004	**LAKE 9 Comp 17 18 20 21**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O

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SAMPLE ANALYTE COUNT

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275005	**LAKE 9 Comp 15 16 19 22**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275006	**LAKE 9 Comp 7 9 10 13**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275007	**LAKE 8 Comp 137**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O

ATTACHMENT A

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275008	**LAKE 8 Comp 248**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O
35760275009	**LAKE 8 Comp 659**	FL-PRO	NCB1	3	PASI-O
		EPA 6010	KPP	8	PASI-O
		EPA 6010	AME	8	PASI-O
		EPA 7470	JNK	1	PASI-O
		EPA 7471	JNK	1	PASI-O
		EPA 8270	TWB	21	PASI-O
		ASTM D2974-87	BMA	1	PASI-O
		TKN+NOx Calculation	NMT	1	PASI-O
		EPA 351.2	CLL	1	PASI-O
		EPA 353.2	KW1	1	PASI-O
		EPA 365.4	CLL	1	PASI-O

PASI-O = Pace Analytical Services - Ormond Beach

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(954)582-4300

SUMMARY OF DETECTION

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
35760275001	**LAKE 9 Comp 134**					
FL-PRO	Petroleum Range Organics	65.2	mg/kg	17.9	11/19/22 02:31	P1
EPA 6010	Arsenic	5.2	mg/kg	0.88	11/22/22 21:49	
EPA 6010	Barium	1.3	mg/kg	0.88	11/22/22 21:49	
EPA 6010	Cadmium	0.30	mg/kg	0.088	11/22/22 21:49	
EPA 6010	Chromium	2.6	mg/kg	0.44	11/22/22 21:49	
EPA 6010	Copper	114	mg/kg	4.4	11/23/22 00:52	J(M1),J(R1)
EPA 6010	Lead	2.8	mg/kg	0.88	11/22/22 21:49	
EPA 6010	Barium	0.011 I	mg/L	0.10	11/22/22 04:35	
EPA 7470	Mercury	0.00090 I	mg/L	0.0020	11/22/22 09:42	
EPA 7471	Mercury	0.022	mg/kg	0.017	11/21/22 11:16	
EPA 8270	Benzo(a)anthracene	0.15 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Benzo(a)pyrene	0.31 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Benzo(b)fluoranthene	0.43	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Benzo(g,h,i)perylene	0.22 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Benzo(k)fluoranthene	0.15 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Chrysene	0.16 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Fluoranthene	0.27 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Indeno(1,2,3-cd)pyrene	0.18 I	mg/kg	0.33	11/18/22 13:42	P1
EPA 8270	Pyrene	0.36	mg/kg	0.33	11/18/22 13:42	P1
ASTM D2974-87	Percent Moisture	45.4	%	0.10	11/17/22 08:52	
TKN+NOx Calculation	Total Nitrogen Soil	983	mg/kg	36.7	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	983	mg/kg	183	11/25/22 14:35	
EPA 365.4	Phosphorus, Total (as P)	59.4	mg/kg	55.0	11/25/22 14:35	
35760275002	**LAKE 9 Comp 256**					
FL-PRO	Petroleum Range Organics	44.5	mg/kg	22.1	11/19/22 05:23	P1
EPA 6010	Arsenic	10.6	mg/kg	1.2	11/22/22 22:07	
EPA 6010	Barium	2.1	mg/kg	1.2	11/22/22 22:07	
EPA 6010	Cadmium	0.26	mg/kg	0.12	11/22/22 22:07	
EPA 6010	Chromium	4.5	mg/kg	0.60	11/22/22 22:07	
EPA 6010	Copper	245	mg/kg	6.0	11/23/22 00:55	
EPA 6010	Lead	4.3	mg/kg	1.2	11/22/22 22:07	
EPA 6010	Arsenic	0.098 I	mg/L	0.10	11/22/22 05:42	
EPA 6010	Barium	0.018 I	mg/L	0.10	11/22/22 05:42	
EPA 7471	Mercury	0.042	mg/kg	0.022	11/21/22 11:18	
ASTM D2974-87	Percent Moisture	55.3	%	0.10	11/17/22 08:52	
TKN+NOx Calculation	Total Nitrogen Soil	2500	mg/kg	44.7	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	2500	mg/kg	223	11/25/22 14:39	
EPA 365.4	Phosphorus, Total (as P)	146	mg/kg	66.9	11/25/22 14:39	
35760275003	**LAKE 9 Comp 8 11 12 14**					
FL-PRO	Petroleum Range Organics	49.7	mg/kg	31.5	11/19/22 02:47	P1
EPA 6010	Arsenic	9.2	mg/kg	1.7	11/22/22 22:10	
EPA 6010	Barium	1.9	mg/kg	1.7	11/22/22 22:10	
EPA 6010	Cadmium	0.37	mg/kg	0.17	11/22/22 22:10	
EPA 6010	Chromium	6.1	mg/kg	0.86	11/22/22 22:10	
EPA 6010	Copper	172	mg/kg	8.6	11/23/22 00:58	
EPA 6010	Lead	8.1	mg/kg	1.7	11/22/22 22:10	

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SUMMARY OF DETECTION

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab Sample ID / Method	Client Sample ID / Parameters	Result		Units	Report Limit	Analyzed	Qualifiers
35760275003	**LAKE 9 Comp 8 11 12 14**						
EPA 6010	Arsenic	0.042	I	mg/L	0.10	11/22/22 05:45	
EPA 6010	Barium	0.013	I	mg/L	0.10	11/22/22 05:45	
EPA 7471	Mercury	0.068		mg/kg	0.031	11/21/22 11:20	
ASTM D2974-87	Percent Moisture	68.9		%	0.10	11/17/22 08:52	
TKN+NOx Calculation	Total Nitrogen Soil	769		mg/kg	64.3	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	769		mg/kg	321	11/25/22 14:40	
35760275004	**LAKE 9 Comp 17 18 20 21**						
EPA 6010	Arsenic	14.5		mg/kg	1.4	11/22/22 22:13	
EPA 6010	Barium	1.5		mg/kg	1.4	11/22/22 22:13	
EPA 6010	Cadmium	0.28		mg/kg	0.14	11/22/22 22:13	
EPA 6010	Chromium	6.6		mg/kg	0.69	11/22/22 22:13	
EPA 6010	Copper	345		mg/kg	6.9	11/23/22 01:07	
EPA 6010	Lead	5.2		mg/kg	1.4	11/22/22 22:13	
EPA 6010	Arsenic	0.10		mg/L	0.10	11/22/22 05:48	
EPA 6010	Barium	0.013	I	mg/L	0.10	11/22/22 05:48	
EPA 7470	Mercury	0.0010	I	mg/L	0.0020	11/22/22 10:03	
EPA 7471	Mercury	0.043		mg/kg	0.027	11/21/22 11:27	
ASTM D2974-87	Percent Moisture	63.6		%	0.10	11/17/22 08:53	
TKN+NOx Calculation	Total Nitrogen Soil	1210		mg/kg	54.9	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	1210		mg/kg	273	11/25/22 14:43	
EPA 365.4	Phosphorus, Total (as P)	76.6	I	mg/kg	82.0	11/25/22 14:43	
35760275005	**LAKE 9 Comp 15 16 19 22**						
EPA 6010	Arsenic	15.6		mg/kg	1.5	11/22/22 22:16	
EPA 6010	Barium	1.9		mg/kg	1.5	11/22/22 22:16	
EPA 6010	Cadmium	0.086	I	mg/kg	0.15	11/22/22 22:16	
EPA 6010	Chromium	4.0		mg/kg	0.74	11/22/22 22:16	
EPA 6010	Copper	51.8		mg/kg	0.74	11/22/22 22:16	
EPA 6010	Lead	4.2		mg/kg	1.5	11/22/22 22:16	
EPA 6010	Arsenic	0.051	I	mg/L	0.10	11/22/22 05:51	
EPA 6010	Barium	0.011	I	mg/L	0.10	11/22/22 05:51	
EPA 7470	Mercury	0.00090	I	mg/L	0.0020	11/22/22 10:05	
EPA 7471	Mercury	0.034		mg/kg	0.022	11/21/22 11:30	
EPA 8270	Benzo(b)fluoranthene	0.16	I	mg/kg	0.46	11/18/22 15:28	P1
ASTM D2974-87	Percent Moisture	59.4		%	0.10	11/17/22 11:36	
TKN+NOx Calculation	Total Nitrogen Soil	2210		mg/kg	49.3	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	2210		mg/kg	246	11/25/22 14:44	
EPA 353.2	Nitrogen, NO2 plus NO3	1.5		mg/kg	1.2	11/19/22 22:07	
EPA 365.4	Phosphorus, Total (as P)	69.5	I	mg/kg	73.7	11/25/22 14:44	
35760275006	**LAKE 9 Comp 7 9 10 13**						
EPA 6010	Arsenic	0.49	I	mg/kg	0.63	11/22/22 22:19	
EPA 6010	Barium	0.19	I	mg/kg	0.63	11/22/22 22:19	
EPA 6010	Chromium	0.30	I	mg/kg	0.32	11/22/22 22:19	
EPA 6010	Copper	3.0		mg/kg	0.32	11/22/22 22:19	
EPA 6010	Lead	0.43	I	mg/kg	0.63	11/22/22 22:19	
EPA 7470	Mercury	0.00090	I	mg/L	0.0020	11/22/22 10:07	
EPA 7471	Mercury	0.0092	I	mg/kg	0.012	11/21/22 11:32	

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SUMMARY OF DETECTION

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
35760275006	**LAKE 9 Comp 7 9 10 13**					
EPA 8270	Benzo(a)anthracene	0.041 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Benzo(a)pyrene	0.074 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Benzo(b)fluoranthene	0.11 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Benzo(g,h,i)perylene	0.057 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Chrysene	0.035 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Indeno(1,2,3-cd)pyrene	0.046 I	mg/kg	0.18	11/18/22 15:54	P1
EPA 8270	Pyrene	0.073 I	mg/kg	0.18	11/18/22 15:54	P1
ASTM D2974-87	Percent Moisture	23.5	%	0.10	11/17/22 11:36	
TKN+NOx Calculation	Total Nitrogen Soil	148	mg/kg	26.1	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	148	mg/kg	130	11/25/22 14:45	
35760275007	**LAKE 8 Comp 137**					
EPA 6010	Arsenic	16.4	mg/kg	1.3	11/22/22 22:22	
EPA 6010	Barium	1.5	mg/kg	1.3	11/22/22 22:22	
EPA 6010	Cadmium	0.17	mg/kg	0.13	11/22/22 22:22	
EPA 6010	Chromium	5.1	mg/kg	0.66	11/22/22 22:22	
EPA 6010	Copper	44.3	mg/kg	0.66	11/22/22 22:22	
EPA 6010	Lead	28.9	mg/kg	1.3	11/22/22 22:22	
EPA 6010	Arsenic	0.11	mg/L	0.10	11/22/22 05:58	
EPA 6010	Barium	0.0089 I	mg/L	0.10	11/22/22 05:58	
EPA 7471	Mercury	0.074	mg/kg	0.022	11/21/22 11:34	
EPA 8270	Benzo(a)pyrene	0.23 I	mg/kg	0.34	11/18/22 16:20	P1
EPA 8270	Benzo(b)fluoranthene	0.28 I	mg/kg	0.34	11/18/22 16:20	P1
EPA 8270	Benzo(g,h,i)perylene	0.19 I	mg/kg	0.34	11/18/22 16:20	P1
EPA 8270	Benzo(k)fluoranthene	0.12 I	mg/kg	0.34	11/18/22 16:20	P1
EPA 8270	Chrysene	0.047 I	mg/kg	0.34	11/18/22 16:20	P1
EPA 8270	Indeno(1,2,3-cd)pyrene	0.16 I	mg/kg	0.34	11/18/22 16:20	P1
ASTM D2974-87	Percent Moisture	55.3	%	0.10	11/17/22 11:37	
TKN+NOx Calculation	Total Nitrogen Soil	1930	mg/kg	44.7	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	1930	mg/kg	222	11/25/22 14:46	
EPA 365.4	Phosphorus, Total (as P)	106	mg/kg	66.5	11/25/22 14:46	
35760275008	**LAKE 8 Comp 248**					
EPA 6010	Arsenic	4.2	mg/kg	0.78	11/22/22 22:26	
EPA 6010	Barium	0.58 I	mg/kg	0.78	11/22/22 22:26	
EPA 6010	Cadmium	0.058 I	mg/kg	0.078	11/22/22 22:26	
EPA 6010	Chromium	1.8	mg/kg	0.39	11/22/22 22:26	
EPA 6010	Copper	24.2	mg/kg	0.39	11/22/22 22:26	
EPA 6010	Lead	10.2	mg/kg	0.78	11/22/22 22:26	
EPA 6010	Arsenic	0.042 I	mg/L	0.10	11/22/22 06:01	
EPA 6010	Barium	0.0098 I	mg/L	0.10	11/22/22 06:01	
EPA 7471	Mercury	0.020	mg/kg	0.014	11/21/22 11:36	
ASTM D2974-87	Percent Moisture	33.6	%	0.10	11/17/22 11:37	
TKN+NOx Calculation	Total Nitrogen Soil	675	mg/kg	30.1	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	675	mg/kg	150	11/25/22 14:47	
EPA 365.4	Phosphorus, Total (as P)	43.3 I	mg/kg	45.1	11/25/22 14:47	
35760275009	**LAKE 8 Comp 659**					
FL-PRO	Petroleum Range Organics	59.2	mg/kg	13.6	11/19/22 03:34	P1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

SUMMARY OF DETECTION

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab Sample ID / Method	Client Sample ID / Parameters	Result		Units	Report Limit	Analyzed	Qualifiers
35760275009	**LAKE 8 Comp 659**						
EPA 6010	Arsenic	4.1		mg/kg	0.76	11/22/22 22:41	
EPA 6010	Barium	2.2		mg/kg	0.76	11/22/22 22:41	
EPA 6010	Cadmium	0.11		mg/kg	0.076	11/22/22 22:41	
EPA 6010	Chromium	4.6		mg/kg	0.38	11/22/22 22:41	
EPA 6010	Copper	26.8		mg/kg	0.38	11/22/22 22:41	
EPA 6010	Lead	37.2		mg/kg	0.76	11/22/22 22:41	
EPA 6010	Selenium	1.5		mg/kg	1.1	11/22/22 22:41	
EPA 6010	Barium	0.029	I	mg/L	0.10	11/22/22 06:04	
EPA 7471	Mercury	0.021		mg/kg	0.014	11/21/22 11:39	
EPA 8270	Benzo(a)anthracene	0.063	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Benzo(a)pyrene	0.067	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Benzo(b)fluoranthene	0.10	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Benzo(g,h,i)perylene	0.049	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Chrysene	0.074	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Fluoranthene	0.13	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Indeno(1,2,3-cd)pyrene	0.039	I	mg/kg	0.16	11/18/22 17:12	P1
EPA 8270	Pyrene	0.094	I	mg/kg	0.16	11/18/22 17:12	P1
ASTM D2974-87	Percent Moisture	27.9		%	0.10	11/17/22 11:37	
TKN+NOx Calculation	Total Nitrogen Soil	755		mg/kg	27.7	12/05/22 15:17	
EPA 351.2	Nitrogen, Kjeldahl, Total	755		mg/kg	138	11/25/22 14:49	
EPA 365.4	Phosphorus, Total (as P)	140		mg/kg	41.5	11/25/22 14:49	

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 134 **Lab ID: 35760275001** Collected: 11/14/22 09:10 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**65.2**	mg/kg	17.9	15.4	1	11/17/22 10:23	11/19/22 02:31		P1
Surrogates									
o-Terphenyl (S)	88	%	66-136		1	11/17/22 10:23	11/19/22 02:31	84-15-1	
N-Pentatriacontane (S)	102	%	42-159		1	11/17/22 10:23	11/19/22 02:31	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050 Pace Analytical Services - Ormond Beach								
Arsenic	**5.2**	mg/kg	0.88	0.44	1	11/22/22 14:46	11/22/22 21:49	7440-38-2	
Barium	**1.3**	mg/kg	0.88	0.15	1	11/22/22 14:46	11/22/22 21:49	7440-39-3	
Cadmium	**0.30**	mg/kg	0.088	0.044	1	11/22/22 14:46	11/22/22 21:49	7440-43-9	
Chromium	**2.6**	mg/kg	0.44	0.22	1	11/22/22 14:46	11/22/22 21:49	7440-47-3	
Copper	**114**	mg/kg	4.4	2.2	10	11/22/22 14:46	11/23/22 00:52	7440-50-8	J(M1), J(R1)
Lead	**2.8**	mg/kg	0.88	0.44	1	11/22/22 14:46	11/22/22 21:49	7439-92-1	
Selenium	**0.66 U**	mg/kg	1.3	0.66	1	11/22/22 14:46	11/22/22 21:49	7782-49-2	
Silver	**0.097 U**	mg/kg	0.44	0.097	1	11/22/22 14:46	11/22/22 21:49	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Arsenic	**0.034 U**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 04:35	7440-38-2	
Barium	**0.011 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 04:35	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 04:35	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 04:35	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 04:35	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 04:35	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 04:35	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 04:35	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 I**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 09:42	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471 Pace Analytical Services - Ormond Beach								
Mercury	**0.022**	mg/kg	0.017	0.0086	1	11/18/22 09:16	11/21/22 11:16	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.15 U**	mg/kg	0.35	0.15	1	11/17/22 17:16	11/18/22 13:42	83-32-9	P1
Acenaphthylene	**0.051 U**	mg/kg	0.33	0.051	1	11/17/22 17:16	11/18/22 13:42	208-96-8	P1
Anthracene	**0.044 U**	mg/kg	0.35	0.044	1	11/17/22 17:16	11/18/22 13:42	120-12-7	P1
Benzo(a)anthracene	**0.15 I**	mg/kg	0.33	0.043	1	11/17/22 17:16	11/18/22 13:42	56-55-3	P1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 134 **Lab ID: 35760275001** Collected: 11/14/22 09:10 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.31 I**	mg/kg	0.33	0.081	1	11/17/22 17:16	11/18/22 13:42	50-32-8	P1
Benzo(b)fluoranthene	**0.43**	mg/kg	0.33	0.086	1	11/17/22 17:16	11/18/22 13:42	205-99-2	P1
Benzo(g,h,i)perylene	**0.22 I**	mg/kg	0.33	0.082	1	11/17/22 17:16	11/18/22 13:42	191-24-2	P1
Benzo(k)fluoranthene	**0.15 I**	mg/kg	0.33	0.086	1	11/17/22 17:16	11/18/22 13:42	207-08-9	P1
Chrysene	**0.16 I**	mg/kg	0.33	0.043	1	11/17/22 17:16	11/18/22 13:42	218-01-9	P1
Dibenz(a,h)anthracene	**0.075 U**	mg/kg	0.33	0.075	1	11/17/22 17:16	11/18/22 13:42	53-70-3	P1
Fluoranthene	**0.27 I**	mg/kg	0.33	0.11	1	11/17/22 17:16	11/18/22 13:42	206-44-0	P1
Fluorene	**0.12 U**	mg/kg	0.36	0.12	1	11/17/22 17:16	11/18/22 13:42	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.18 I**	mg/kg	0.33	0.074	1	11/17/22 17:16	11/18/22 13:42	193-39-5	P1
1-Methylnaphthalene	**0.054 U**	mg/kg	0.38	0.054	1	11/17/22 17:16	11/18/22 13:42	90-12-0	P1
2-Methylnaphthalene	**0.051 U**	mg/kg	0.37	0.051	1	11/17/22 17:16	11/18/22 13:42	91-57-6	P1
Naphthalene	**0.12 U**	mg/kg	0.34	0.12	1	11/17/22 17:16	11/18/22 13:42	91-20-3	P1
Phenanthrene	**0.046 U**	mg/kg	0.33	0.046	1	11/17/22 17:16	11/18/22 13:42	85-01-8	P1
Pyrene	**0.36**	mg/kg	0.33	0.043	1	11/17/22 17:16	11/18/22 13:42	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	42	%	24-98		1	11/17/22 17:16	11/18/22 13:42	4165-60-0	
2-Fluorobiphenyl (S)	66	%	29-101		1	11/17/22 17:16	11/18/22 13:42	321-60-8	
p-Terphenyl-d14 (S)	78	%	29-112		1	11/17/22 17:16	11/18/22 13:42	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**45.4**	%	0.10	0.10	1		11/17/22 08:52		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**983**	mg/kg	36.7	20.2	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**983**	mg/kg	183	101	1	11/21/22 10:59	11/25/22 14:35	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.46 U**	mg/kg	0.92	0.46	1	11/19/22 20:30	11/19/22 22:01		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**59.4**	mg/kg	55.0	47.6	1	11/21/22 10:59	11/25/22 14:35	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical
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Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 256 **Lab ID: 35760275002** Collected: 11/14/22 10:00 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**44.5**	mg/kg	22.1	19.0	1	11/17/22 10:23	11/19/22 05:23		P1
Surrogates									
o-Terphenyl (S)	78	%	66-136		1	11/17/22 10:23	11/19/22 05:23	84-15-1	
N-Pentatriacontane (S)	104	%	42-159		1	11/17/22 10:23	11/19/22 05:23	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050 Pace Analytical Services - Ormond Beach								
Arsenic	**10.6**	mg/kg	1.2	0.60	1	11/22/22 14:46	11/22/22 22:07	7440-38-2	
Barium	**2.1**	mg/kg	1.2	0.20	1	11/22/22 14:46	11/22/22 22:07	7440-39-3	
Cadmium	**0.26**	mg/kg	0.12	0.060	1	11/22/22 14:46	11/22/22 22:07	7440-43-9	
Chromium	**4.5**	mg/kg	0.60	0.30	1	11/22/22 14:46	11/22/22 22:07	7440-47-3	
Copper	**245**	mg/kg	6.0	3.0	10	11/22/22 14:46	11/23/22 00:55	7440-50-8	
Lead	**4.3**	mg/kg	1.2	0.60	1	11/22/22 14:46	11/22/22 22:07	7439-92-1	
Selenium	**0.90 U**	mg/kg	1.8	0.90	1	11/22/22 14:46	11/22/22 22:07	7782-49-2	
Silver	**0.13 U**	mg/kg	0.60	0.13	1	11/22/22 14:46	11/22/22 22:07	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Arsenic	**0.098 I**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:42	7440-38-2	
Barium	**0.018 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:42	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:42	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:42	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:42	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:42	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:42	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:42	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 U**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 09:53	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471 Pace Analytical Services - Ormond Beach								
Mercury	**0.042**	mg/kg	0.022	0.011	1	11/18/22 09:16	11/21/22 11:18	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.17 U**	mg/kg	0.39	0.17	1	11/17/22 17:16	11/18/22 14:09	83-32-9	P1
Acenaphthylene	**0.057 U**	mg/kg	0.37	0.057	1	11/17/22 17:16	11/18/22 14:09	208-96-8	P1
Anthracene	**0.050 U**	mg/kg	0.39	0.050	1	11/17/22 17:16	11/18/22 14:09	120-12-7	P1
Benzo(a)anthracene	**0.048 U**	mg/kg	0.37	0.048	1	11/17/22 17:16	11/18/22 14:09	56-55-3	P1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 256 **Lab ID: 35760275002** Collected: 11/14/22 10:00 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.090 U**	mg/kg	0.37	0.090	1	11/17/22 17:16	11/18/22 14:09	50-32-8	P1
Benzo(b)fluoranthene	**0.097 U**	mg/kg	0.37	0.097	1	11/17/22 17:16	11/18/22 14:09	205-99-2	P1
Benzo(g,h,i)perylene	**0.092 U**	mg/kg	0.37	0.092	1	11/17/22 17:16	11/18/22 14:09	191-24-2	P1
Benzo(k)fluoranthene	**0.097 U**	mg/kg	0.37	0.097	1	11/17/22 17:16	11/18/22 14:09	207-08-9	P1
Chrysene	**0.048 U**	mg/kg	0.37	0.048	1	11/17/22 17:16	11/18/22 14:09	218-01-9	P1
Dibenz(a,h)anthracene	**0.084 U**	mg/kg	0.37	0.084	1	11/17/22 17:16	11/18/22 14:09	53-70-3	P1
Fluoranthene	**0.12 U**	mg/kg	0.37	0.12	1	11/17/22 17:16	11/18/22 14:09	206-44-0	P1
Fluorene	**0.13 U**	mg/kg	0.40	0.13	1	11/17/22 17:16	11/18/22 14:09	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.083 U**	mg/kg	0.37	0.083	1	11/17/22 17:16	11/18/22 14:09	193-39-5	P1
1-Methylnaphthalene	**0.060 U**	mg/kg	0.43	0.060	1	11/17/22 17:16	11/18/22 14:09	90-12-0	P1
2-Methylnaphthalene	**0.057 U**	mg/kg	0.42	0.057	1	11/17/22 17:16	11/18/22 14:09	91-57-6	P1
Naphthalene	**0.13 U**	mg/kg	0.38	0.13	1	11/17/22 17:16	11/18/22 14:09	91-20-3	P1
Phenanthrene	**0.052 U**	mg/kg	0.37	0.052	1	11/17/22 17:16	11/18/22 14:09	85-01-8	P1
Pyrene	**0.048 U**	mg/kg	0.37	0.048	1	11/17/22 17:16	11/18/22 14:09	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	45	%	24-98		1	11/17/22 17:16	11/18/22 14:09	4165-60-0	
2-Fluorobiphenyl (S)	69	%	29-101		1	11/17/22 17:16	11/18/22 14:09	321-60-8	
p-Terphenyl-d14 (S)	78	%	29-112		1	11/17/22 17:16	11/18/22 14:09	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**55.3**	%	0.10	0.10	1		11/17/22 08:52		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**2500**	mg/kg	44.7	24.6	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**2500**	mg/kg	223	123	1	11/21/22 10:59	11/25/22 14:39	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.56 U**	mg/kg	1.1	0.56	1	11/19/22 20:30	11/19/22 22:04		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**146**	mg/kg	66.9	58.0	1	11/21/22 10:59	11/25/22 14:39	7723-14-0	

Pace Analytical Services, LLC
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(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 8 11 12 14 **Lab ID: 35760275003** Collected: 11/14/22 11:00 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**49.7**	mg/kg	31.5	27.1	1	11/17/22 10:23	11/19/22 02:47		P1
Surrogates									
o-Terphenyl (S)	86	%	66-136		1	11/17/22 10:23	11/19/22 02:47	84-15-1	
N-Pentatriacontane (S)	100	%	42-159		1	11/17/22 10:23	11/19/22 02:47	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
	Pace Analytical Services - Ormond Beach								
Arsenic	**9.2**	mg/kg	1.7	0.86	1	11/22/22 14:46	11/22/22 22:10	7440-38-2	
Barium	**1.9**	mg/kg	1.7	0.29	1	11/22/22 14:46	11/22/22 22:10	7440-39-3	
Cadmium	**0.37**	mg/kg	0.17	0.086	1	11/22/22 14:46	11/22/22 22:10	7440-43-9	
Chromium	**6.1**	mg/kg	0.86	0.43	1	11/22/22 14:46	11/22/22 22:10	7440-47-3	
Copper	**172**	mg/kg	8.6	4.3	10	11/22/22 14:46	11/23/22 00:58	7440-50-8	
Lead	**8.1**	mg/kg	1.7	0.86	1	11/22/22 14:46	11/22/22 22:10	7439-92-1	
Selenium	**1.3 U**	mg/kg	2.6	1.3	1	11/22/22 14:46	11/22/22 22:10	7782-49-2	
Silver	**0.19 U**	mg/kg	0.86	0.19	1	11/22/22 14:46	11/22/22 22:10	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Arsenic	**0.042 I**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:45	7440-38-2	
Barium	**0.013 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:45	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:45	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:45	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:45	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:45	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:45	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:45	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 U**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 09:56	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.068**	mg/kg	0.031	0.015	1	11/18/22 09:16	11/21/22 11:20	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.29 U**	mg/kg	0.64	0.29	1	11/17/22 17:16	11/18/22 14:35	83-32-9	P1
Acenaphthylene	**0.095 U**	mg/kg	0.61	0.095	1	11/17/22 17:16	11/18/22 14:35	208-96-8	P1
Anthracene	**0.082 U**	mg/kg	0.64	0.082	1	11/17/22 17:16	11/18/22 14:35	120-12-7	P1
Benzo(a)anthracene	**0.081 U**	mg/kg	0.61	0.081	1	11/17/22 17:16	11/18/22 14:35	56-55-3	P1

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 8 11 12 14 **Lab ID: 35760275003** Collected: 11/14/22 11:00 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.15 U**	mg/kg	0.61	0.15	1	11/17/22 17:16	11/18/22 14:35	50-32-8	P1
Benzo(b)fluoranthene	**0.16 U**	mg/kg	0.61	0.16	1	11/17/22 17:16	11/18/22 14:35	205-99-2	P1
Benzo(g,h,i)perylene	**0.15 U**	mg/kg	0.61	0.15	1	11/17/22 17:16	11/18/22 14:35	191-24-2	P1
Benzo(k)fluoranthene	**0.16 U**	mg/kg	0.61	0.16	1	11/17/22 17:16	11/18/22 14:35	207-08-9	P1
Chrysene	**0.081 U**	mg/kg	0.61	0.081	1	11/17/22 17:16	11/18/22 14:35	218-01-9	P1
Dibenz(a,h)anthracene	**0.14 U**	mg/kg	0.61	0.14	1	11/17/22 17:16	11/18/22 14:35	53-70-3	P1
Fluoranthene	**0.20 U**	mg/kg	0.61	0.20	1	11/17/22 17:16	11/18/22 14:35	206-44-0	P1
Fluorene	**0.21 U**	mg/kg	0.66	0.21	1	11/17/22 17:16	11/18/22 14:35	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.14 U**	mg/kg	0.61	0.14	1	11/17/22 17:16	11/18/22 14:35	193-39-5	P1
1-Methylnaphthalene	**0.10 U**	mg/kg	0.72	0.10	1	11/17/22 17:16	11/18/22 14:35	90-12-0	P1
2-Methylnaphthalene	**0.095 U**	mg/kg	0.70	0.095	1	11/17/22 17:16	11/18/22 14:35	91-57-6	P1
Naphthalene	**0.21 U**	mg/kg	0.63	0.21	1	11/17/22 17:16	11/18/22 14:35	91-20-3	P1
Phenanthrene	**0.086 U**	mg/kg	0.61	0.086	1	11/17/22 17:16	11/18/22 14:35	85-01-8	P1
Pyrene	**0.081 U**	mg/kg	0.61	0.081	1	11/17/22 17:16	11/18/22 14:35	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	41	%	24-98		1	11/17/22 17:16	11/18/22 14:35	4165-60-0	
2-Fluorobiphenyl (S)	62	%	29-101		1	11/17/22 17:16	11/18/22 14:35	321-60-8	
p-Terphenyl-d14 (S)	69	%	29-112		1	11/17/22 17:16	11/18/22 14:35	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
	Pace Analytical Services - Ormond Beach								
Percent Moisture	**68.9**	%	0.10	0.10	1		11/17/22 08:52		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation								
	Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**769**	mg/kg	64.3	35.4	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**769**	mg/kg	321	177	1	11/21/22 10:59	11/25/22 14:40	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.81 U**	mg/kg	1.6	0.81	1	11/19/22 20:30	11/19/22 22:05		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4								
	Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**83.6 U**	mg/kg	96.4	83.6	1	11/21/22 10:59	11/25/22 14:40	7723-14-0	

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio

Pace Project No.: 35760275

Sample: LAKE 9 Comp 17 18 20 21 **Lab ID: 35760275004** Collected: 11/14/22 13:05 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**23.5 U**	mg/kg	27.4	23.5	1	11/17/22 10:23	11/19/22 05:38		P1
Surrogates									
o-Terphenyl (S)	81	%	66-136		1	11/17/22 10:23	11/19/22 05:38	84-15-1	
N-Pentatriacontane (S)	110	%	42-159		1	11/17/22 10:23	11/19/22 05:38	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
	Pace Analytical Services - Ormond Beach								
Arsenic	**14.5**	mg/kg	1.4	0.69	1	11/22/22 14:46	11/22/22 22:13	7440-38-2	
Barium	**1.5**	mg/kg	1.4	0.23	1	11/22/22 14:46	11/22/22 22:13	7440-39-3	
Cadmium	**0.28**	mg/kg	0.14	0.069	1	11/22/22 14:46	11/22/22 22:13	7440-43-9	
Chromium	**6.6**	mg/kg	0.69	0.35	1	11/22/22 14:46	11/22/22 22:13	7440-47-3	
Copper	**345**	mg/kg	6.9	3.5	10	11/22/22 14:46	11/23/22 01:07	7440-50-8	
Lead	**5.2**	mg/kg	1.4	0.69	1	11/22/22 14:46	11/22/22 22:13	7439-92-1	
Selenium	**1.0 U**	mg/kg	2.1	1.0	1	11/22/22 14:46	11/22/22 22:13	7782-49-2	
Silver	**0.15 U**	mg/kg	0.69	0.15	1	11/22/22 14:46	11/22/22 22:13	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Arsenic	**0.10**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:48	7440-38-2	
Barium	**0.013 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:48	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:48	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:48	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:48	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:48	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:48	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:48	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.0010 I**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:03	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.043**	mg/kg	0.027	0.013	1	11/18/22 09:16	11/21/22 11:27	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.18 U**	mg/kg	0.40	0.18	1	11/17/22 17:16	11/18/22 15:01	83-32-9	P1
Acenaphthylene	**0.059 U**	mg/kg	0.38	0.059	1	11/17/22 17:16	11/18/22 15:01	208-96-8	P1
Anthracene	**0.051 U**	mg/kg	0.40	0.051	1	11/17/22 17:16	11/18/22 15:01	120-12-7	P1
Benzo(a)anthracene	**0.050 U**	mg/kg	0.38	0.050	1	11/17/22 17:16	11/18/22 15:01	56-55-3	P1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 17 18 20 21 **Lab ID: 35760275004** Collected: 11/14/22 13:05 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.093 U**	mg/kg	0.38	0.093	1	11/17/22 17:16	11/18/22 15:01	50-32-8	P1
Benzo(b)fluoranthene	**0.10 U**	mg/kg	0.38	0.10	1	11/17/22 17:16	11/18/22 15:01	205-99-2	P1
Benzo(g,h,i)perylene	**0.094 U**	mg/kg	0.38	0.094	1	11/17/22 17:16	11/18/22 15:01	191-24-2	P1
Benzo(k)fluoranthene	**0.10 U**	mg/kg	0.38	0.10	1	11/17/22 17:16	11/18/22 15:01	207-08-9	P1
Chrysene	**0.050 U**	mg/kg	0.38	0.050	1	11/17/22 17:16	11/18/22 15:01	218-01-9	P1
Dibenz(a,h)anthracene	**0.087 U**	mg/kg	0.38	0.087	1	11/17/22 17:16	11/18/22 15:01	53-70-3	P1
Fluoranthene	**0.12 U**	mg/kg	0.38	0.12	1	11/17/22 17:16	11/18/22 15:01	206-44-0	P1
Fluorene	**0.13 U**	mg/kg	0.41	0.13	1	11/17/22 17:16	11/18/22 15:01	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.086 U**	mg/kg	0.38	0.086	1	11/17/22 17:16	11/18/22 15:01	193-39-5	P1
1-Methylnaphthalene	**0.062 U**	mg/kg	0.44	0.062	1	11/17/22 17:16	11/18/22 15:01	90-12-0	P1
2-Methylnaphthalene	**0.059 U**	mg/kg	0.43	0.059	1	11/17/22 17:16	11/18/22 15:01	91-57-6	P1
Naphthalene	**0.13 U**	mg/kg	0.39	0.13	1	11/17/22 17:16	11/18/22 15:01	91-20-3	P1
Phenanthrene	**0.053 U**	mg/kg	0.38	0.053	1	11/17/22 17:16	11/18/22 15:01	85-01-8	P1
Pyrene	**0.050 U**	mg/kg	0.38	0.050	1	11/17/22 17:16	11/18/22 15:01	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	45	%	24-98		1	11/17/22 17:16	11/18/22 15:01	4165-60-0	
2-Fluorobiphenyl (S)	68	%	29-101		1	11/17/22 17:16	11/18/22 15:01	321-60-8	
p-Terphenyl-d14 (S)	73	%	29-112		1	11/17/22 17:16	11/18/22 15:01	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**63.6**	%	0.10	0.10	1		11/17/22 08:53		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**1210**	mg/kg	54.9	30.2	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**1210**	mg/kg	273	150	1	11/21/22 10:59	11/25/22 14:43	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.69 U**	mg/kg	1.4	0.69	1	11/19/22 20:30	11/19/22 22:06		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**76.6 I**	mg/kg	82.0	71.1	1	11/21/22 10:59	11/25/22 14:43	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
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(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 15 16 19 22 Lab ID: 35760275005 Collected: 11/14/22 14:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**20.6 U**	mg/kg	24.0	20.6	1	11/17/22 10:23	11/19/22 03:02		P1
Surrogates									
o-Terphenyl (S)	93	%	66-136		1	11/17/22 10:23	11/19/22 03:02	84-15-1	
N-Pentatriacontane (S)	106	%	42-159		1	11/17/22 10:23	11/19/22 03:02	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
	Pace Analytical Services - Ormond Beach								
Arsenic	**15.6**	mg/kg	1.5	0.74	1	11/22/22 14:46	11/22/22 22:16	7440-38-2	
Barium	**1.9**	mg/kg	1.5	0.25	1	11/22/22 14:46	11/22/22 22:16	7440-39-3	
Cadmium	**0.086 I**	mg/kg	0.15	0.074	1	11/22/22 14:46	11/22/22 22:16	7440-43-9	
Chromium	**4.0**	mg/kg	0.74	0.37	1	11/22/22 14:46	11/22/22 22:16	7440-47-3	
Copper	**51.8**	mg/kg	0.74	0.37	1	11/22/22 14:46	11/22/22 22:16	7440-50-8	
Lead	**4.2**	mg/kg	1.5	0.74	1	11/22/22 14:46	11/22/22 22:16	7439-92-1	
Selenium	**1.1 U**	mg/kg	2.2	1.1	1	11/22/22 14:46	11/22/22 22:16	7782-49-2	
Silver	**0.16 U**	mg/kg	0.74	0.16	1	11/22/22 14:46	11/22/22 22:16	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Arsenic	**0.051 I**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:51	7440-38-2	
Barium	**0.011 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:51	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:51	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:51	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:51	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:51	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:51	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:51	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 I**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:05	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.034**	mg/kg	0.022	0.011	1	11/18/22 09:16	11/21/22 11:30	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.22 U**	mg/kg	0.48	0.22	1	11/17/22 17:16	11/18/22 15:28	83-32-9	P1
Acenaphthylene	**0.071 U**	mg/kg	0.46	0.071	1	11/17/22 17:16	11/18/22 15:28	208-96-8	P1
Anthracene	**0.062 U**	mg/kg	0.48	0.062	1	11/17/22 17:16	11/18/22 15:28	120-12-7	P1
Benzo(a)anthracene	**0.060 U**	mg/kg	0.46	0.060	1	11/17/22 17:16	11/18/22 15:28	56-55-3	P1

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3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 15 16 19 22 **Lab ID: 35760275005** Collected: 11/14/22 14:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.11 U**	mg/kg	0.46	0.11	1	11/17/22 17:16	11/18/22 15:28	50-32-8	P1
Benzo(b)fluoranthene	**0.16 I**	mg/kg	0.46	0.12	1	11/17/22 17:16	11/18/22 15:28	205-99-2	P1
Benzo(g,h,i)perylene	**0.11 U**	mg/kg	0.46	0.11	1	11/17/22 17:16	11/18/22 15:28	191-24-2	P1
Benzo(k)fluoranthene	**0.12 U**	mg/kg	0.46	0.12	1	11/17/22 17:16	11/18/22 15:28	207-08-9	P1
Chrysene	**0.060 U**	mg/kg	0.46	0.060	1	11/17/22 17:16	11/18/22 15:28	218-01-9	P1
Dibenz(a,h)anthracene	**0.10 U**	mg/kg	0.46	0.10	1	11/17/22 17:16	11/18/22 15:28	53-70-3	P1
Fluoranthene	**0.15 U**	mg/kg	0.46	0.15	1	11/17/22 17:16	11/18/22 15:28	206-44-0	P1
Fluorene	**0.16 U**	mg/kg	0.50	0.16	1	11/17/22 17:16	11/18/22 15:28	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.10 U**	mg/kg	0.46	0.10	1	11/17/22 17:16	11/18/22 15:28	193-39-5	P1
1-Methylnaphthalene	**0.075 U**	mg/kg	0.54	0.075	1	11/17/22 17:16	11/18/22 15:28	90-12-0	P1
2-Methylnaphthalene	**0.071 U**	mg/kg	0.52	0.071	1	11/17/22 17:16	11/18/22 15:28	91-57-6	P1
Naphthalene	**0.16 U**	mg/kg	0.47	0.16	1	11/17/22 17:16	11/18/22 15:28	91-20-3	P1
Phenanthrene	**0.065 U**	mg/kg	0.46	0.065	1	11/17/22 17:16	11/18/22 15:28	85-01-8	P1
Pyrene	**0.060 U**	mg/kg	0.46	0.060	1	11/17/22 17:16	11/18/22 15:28	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	47	%	24-98		1	11/17/22 17:16	11/18/22 15:28	4165-60-0	
2-Fluorobiphenyl (S)	69	%	29-101		1	11/17/22 17:16	11/18/22 15:28	321-60-8	
p-Terphenyl-d14 (S)	74	%	29-112		1	11/17/22 17:16	11/18/22 15:28	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
	Pace Analytical Services - Ormond Beach								
Percent Moisture	**59.4**	%	0.10	0.10	1		11/17/22 11:36		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation								
	Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**2210**	mg/kg	49.3	27.1	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**2210**	mg/kg	246	135	1	11/21/22 10:59	11/25/22 14:44	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**1.5**	mg/kg	1.2	0.62	1	11/19/22 20:30	11/19/22 22:07		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4								
	Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**69.5 I**	mg/kg	73.7	63.9	1	11/21/22 10:59	11/25/22 14:44	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 7 9 10 13 **Lab ID: 35760275006** Collected: 11/14/22 15:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**11.1 U**	mg/kg	12.9	11.1	1	11/17/22 10:23	11/19/22 05:38		P1
Surrogates									
o-Terphenyl (S)	98	%	66-136		1	11/17/22 10:23	11/19/22 05:38	84-15-1	
N-Pentatriacontane (S)	104	%	42-159		1	11/17/22 10:23	11/19/22 05:38	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050 Pace Analytical Services - Ormond Beach								
Arsenic	**0.49 I**	mg/kg	0.63	0.32	1	11/22/22 14:46	11/22/22 22:19	7440-38-2	
Barium	**0.19 I**	mg/kg	0.63	0.11	1	11/22/22 14:46	11/22/22 22:19	7440-39-3	
Cadmium	**0.032 U**	mg/kg	0.063	0.032	1	11/22/22 14:46	11/22/22 22:19	7440-43-9	
Chromium	**0.30 I**	mg/kg	0.32	0.16	1	11/22/22 14:46	11/22/22 22:19	7440-47-3	
Copper	**3.0**	mg/kg	0.32	0.16	1	11/22/22 14:46	11/22/22 22:19	7440-50-8	
Lead	**0.43 I**	mg/kg	0.63	0.32	1	11/22/22 14:46	11/22/22 22:19	7439-92-1	
Selenium	**0.48 U**	mg/kg	0.95	0.48	1	11/22/22 14:46	11/22/22 22:19	7782-49-2	
Silver	**0.070 U**	mg/kg	0.32	0.070	1	11/22/22 14:46	11/22/22 22:19	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Arsenic	**0.034 U**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:55	7440-38-2	
Barium	**0.0084 U**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:55	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:55	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:55	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:55	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:55	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:55	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:55	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 I**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:07	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471 Pace Analytical Services - Ormond Beach								
Mercury	**0.0092 I**	mg/kg	0.012	0.0058	1	11/18/22 09:16	11/21/22 11:32	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.084 U**	mg/kg	0.19	0.084	1	11/17/22 17:16	11/18/22 15:54	83-32-9	P1
Acenaphthylene	**0.028 U**	mg/kg	0.18	0.028	1	11/17/22 17:16	11/18/22 15:54	208-96-8	P1
Anthracene	**0.024 U**	mg/kg	0.19	0.024	1	11/17/22 17:16	11/18/22 15:54	120-12-7	P1
Benzo(a)anthracene	**0.041 I**	mg/kg	0.18	0.024	1	11/17/22 17:16	11/18/22 15:54	56-55-3	P1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 9 Comp 7 9 10 13 **Lab ID: 35760275006** Collected: 11/14/22 15:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.074 I**	mg/kg	0.18	0.044	1	11/17/22 17:16	11/18/22 15:54	50-32-8	P1
Benzo(b)fluoranthene	**0.11 I**	mg/kg	0.18	0.047	1	11/17/22 17:16	11/18/22 15:54	205-99-2	P1
Benzo(g,h,i)perylene	**0.057 I**	mg/kg	0.18	0.045	1	11/17/22 17:16	11/18/22 15:54	191-24-2	P1
Benzo(k)fluoranthene	**0.047 U**	mg/kg	0.18	0.047	1	11/17/22 17:16	11/18/22 15:54	207-08-9	P1
Chrysene	**0.035 I**	mg/kg	0.18	0.024	1	11/17/22 17:16	11/18/22 15:54	218-01-9	P1
Dibenz(a,h)anthracene	**0.041 U**	mg/kg	0.18	0.041	1	11/17/22 17:16	11/18/22 15:54	53-70-3	P1
Fluoranthene	**0.058 U**	mg/kg	0.18	0.058	1	11/17/22 17:16	11/18/22 15:54	206-44-0	P1
Fluorene	**0.063 U**	mg/kg	0.20	0.063	1	11/17/22 17:16	11/18/22 15:54	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.046 I**	mg/kg	0.18	0.041	1	11/17/22 17:16	11/18/22 15:54	193-39-5	P1
1-Methylnaphthalene	**0.030 U**	mg/kg	0.21	0.030	1	11/17/22 17:16	11/18/22 15:54	90-12-0	P1
2-Methylnaphthalene	**0.028 U**	mg/kg	0.21	0.028	1	11/17/22 17:16	11/18/22 15:54	91-57-6	P1
Naphthalene	**0.063 U**	mg/kg	0.18	0.063	1	11/17/22 17:16	11/18/22 15:54	91-20-3	P1
Phenanthrene	**0.025 U**	mg/kg	0.18	0.025	1	11/17/22 17:16	11/18/22 15:54	85-01-8	P1
Pyrene	**0.073 I**	mg/kg	0.18	0.024	1	11/17/22 17:16	11/18/22 15:54	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	32	%	24-98		1	11/17/22 17:16	11/18/22 15:54	4165-60-0	
2-Fluorobiphenyl (S)	49	%	29-101		1	11/17/22 17:16	11/18/22 15:54	321-60-8	
p-Terphenyl-d14 (S)	73	%	29-112		1	11/17/22 17:16	11/18/22 15:54	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**23.5**	%	0.10	0.10	1		11/17/22 11:36		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**148**	mg/kg	26.1	14.4	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**148**	mg/kg	130	71.4	1	11/21/22 10:59	11/25/22 14:45	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.32 U**	mg/kg	0.65	0.32	1	11/19/22 20:30	11/19/22 22:08		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**33.7 U**	mg/kg	38.9	33.7	1	11/21/22 10:59	11/25/22 14:45	7723-14-0	

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 8 Comp 137 **Lab ID: 35760275007** Collected: 11/15/22 09:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**18.9 U**	mg/kg	22.0	18.9	1	11/17/22 10:23	11/19/22 03:18		P1
Surrogates									
o-Terphenyl (S)	87	%	66-136		1	11/17/22 10:23	11/19/22 03:18	84-15-1	
N-Pentatriacontane (S)	99	%	42-159		1	11/17/22 10:23	11/19/22 03:18	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
	Pace Analytical Services - Ormond Beach								
Arsenic	**16.4**	mg/kg	1.3	0.66	1	11/22/22 14:46	11/22/22 22:22	7440-38-2	
Barium	**1.5**	mg/kg	1.3	0.22	1	11/22/22 14:46	11/22/22 22:22	7440-39-3	
Cadmium	**0.17**	mg/kg	0.13	0.066	1	11/22/22 14:46	11/22/22 22:22	7440-43-9	
Chromium	**5.1**	mg/kg	0.66	0.33	1	11/22/22 14:46	11/22/22 22:22	7440-47-3	
Copper	**44.3**	mg/kg	0.66	0.33	1	11/22/22 14:46	11/22/22 22:22	7440-50-8	
Lead	**28.9**	mg/kg	1.3	0.66	1	11/22/22 14:46	11/22/22 22:22	7439-92-1	
Selenium	**1.0 U**	mg/kg	2.0	1.0	1	11/22/22 14:46	11/22/22 22:22	7782-49-2	
Silver	**0.15 U**	mg/kg	0.66	0.15	1	11/22/22 14:46	11/22/22 22:22	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Arsenic	**0.11**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 05:58	7440-38-2	
Barium	**0.0089 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 05:58	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 05:58	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 05:58	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 05:58	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 05:58	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 05:58	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 05:58	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 U**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:09	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.074**	mg/kg	0.022	0.011	1	11/18/22 09:16	11/21/22 11:34	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.16 U**	mg/kg	0.36	0.16	1	11/17/22 17:16	11/18/22 16:20	83-32-9	P1
Acenaphthylene	**0.053 U**	mg/kg	0.34	0.053	1	11/17/22 17:16	11/18/22 16:20	208-96-8	P1
Anthracene	**0.046 U**	mg/kg	0.36	0.046	1	11/17/22 17:16	11/18/22 16:20	120-12-7	P1
Benzo(a)anthracene	**0.045 U**	mg/kg	0.34	0.045	1	11/17/22 17:16	11/18/22 16:20	56-55-3	P1

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio

Pace Project No.: 35760275

Sample: LAKE 8 Comp 137 **Lab ID: 35760275007** Collected: 11/15/22 09:20 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.23 I**	mg/kg	0.34	0.084	1	11/17/22 17:16	11/18/22 16:20	50-32-8	P1
Benzo(b)fluoranthene	**0.28 I**	mg/kg	0.34	0.090	1	11/17/22 17:16	11/18/22 16:20	205-99-2	P1
Benzo(g,h,i)perylene	**0.19 I**	mg/kg	0.34	0.085	1	11/17/22 17:16	11/18/22 16:20	191-24-2	P1
Benzo(k)fluoranthene	**0.12 I**	mg/kg	0.34	0.090	1	11/17/22 17:16	11/18/22 16:20	207-08-9	P1
Chrysene	**0.047 I**	mg/kg	0.34	0.045	1	11/17/22 17:16	11/18/22 16:20	218-01-9	P1
Dibenz(a,h)anthracene	**0.078 U**	mg/kg	0.34	0.078	1	11/17/22 17:16	11/18/22 16:20	53-70-3	P1
Fluoranthene	**0.11 U**	mg/kg	0.34	0.11	1	11/17/22 17:16	11/18/22 16:20	206-44-0	P1
Fluorene	**0.12 U**	mg/kg	0.37	0.12	1	11/17/22 17:16	11/18/22 16:20	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.16 I**	mg/kg	0.34	0.077	1	11/17/22 17:16	11/18/22 16:20	193-39-5	P1
1-Methylnaphthalene	**0.056 U**	mg/kg	0.40	0.056	1	11/17/22 17:16	11/18/22 16:20	90-12-0	P1
2-Methylnaphthalene	**0.053 U**	mg/kg	0.39	0.053	1	11/17/22 17:16	11/18/22 16:20	91-57-6	P1
Naphthalene	**0.12 U**	mg/kg	0.35	0.12	1	11/17/22 17:16	11/18/22 16:20	91-20-3	P1
Phenanthrene	**0.048 U**	mg/kg	0.34	0.048	1	11/17/22 17:16	11/18/22 16:20	85-01-8	P1
Pyrene	**0.045 U**	mg/kg	0.34	0.045	1	11/17/22 17:16	11/18/22 16:20	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	42	%	24-98		1	11/17/22 17:16	11/18/22 16:20	4165-60-0	
2-Fluorobiphenyl (S)	64	%	29-101		1	11/17/22 17:16	11/18/22 16:20	321-60-8	
p-Terphenyl-d14 (S)	76	%	29-112		1	11/17/22 17:16	11/18/22 16:20	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**55.3**	%	0.10	0.10	1		11/17/22 11:37		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**1930**	mg/kg	44.7	24.6	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**1930**	mg/kg	222	122	1	11/21/22 10:59	11/25/22 14:46	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.56 U**	mg/kg	1.1	0.56	1	11/19/22 20:30	11/19/22 22:12		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**106**	mg/kg	66.5	57.7	1	11/21/22 10:59	11/25/22 14:46	7723-14-0	

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio

Pace Project No.: 35760275

Sample: LAKE 8 Comp 248 **Lab ID: 35760275008** Collected: 11/15/22 10:15 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**12.7 U**	mg/kg	14.8	12.7	1	11/17/22 10:23	11/19/22 04:36		P1
Surrogates									
o-Terphenyl (S)	94	%	66-136		1	11/17/22 10:23	11/19/22 04:36	84-15-1	
N-Pentatriacontane (S)	104	%	42-159		1	11/17/22 10:23	11/19/22 04:36	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050 Pace Analytical Services - Ormond Beach								
Arsenic	**4.2**	mg/kg	0.78	0.39	1	11/22/22 14:46	11/22/22 22:26	7440-38-2	
Barium	**0.58 I**	mg/kg	0.78	0.13	1	11/22/22 14:46	11/22/22 22:26	7440-39-3	
Cadmium	**0.058 I**	mg/kg	0.078	0.039	1	11/22/22 14:46	11/22/22 22:26	7440-43-9	
Chromium	**1.8**	mg/kg	0.39	0.19	1	11/22/22 14:46	11/22/22 22:26	7440-47-3	
Copper	**24.2**	mg/kg	0.39	0.19	1	11/22/22 14:46	11/22/22 22:26	7440-50-8	
Lead	**10.2**	mg/kg	0.78	0.39	1	11/22/22 14:46	11/22/22 22:26	7439-92-1	
Selenium	**0.58 U**	mg/kg	1.2	0.58	1	11/22/22 14:46	11/22/22 22:26	7782-49-2	
Silver	**0.086 U**	mg/kg	0.39	0.086	1	11/22/22 14:46	11/22/22 22:26	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Arsenic	**0.042 I**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 06:01	7440-38-2	
Barium	**0.0098 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 06:01	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 06:01	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 06:01	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 06:01	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 06:01	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 06:01	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 06:01	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Leachate Method/Date: EPA 1311; 11/20/22 12:30 Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 U**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:12	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471 Pace Analytical Services - Ormond Beach								
Mercury	**0.020**	mg/kg	0.014	0.0072	1	11/18/22 09:16	11/21/22 11:36	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.088 U**	mg/kg	0.20	0.088	1	11/17/22 17:16	11/18/22 16:46	83-32-9	P1
Acenaphthylene	**0.029 U**	mg/kg	0.19	0.029	1	11/17/22 17:16	11/18/22 16:46	208-96-8	P1
Anthracene	**0.025 U**	mg/kg	0.20	0.025	1	11/17/22 17:16	11/18/22 16:46	120-12-7	P1
Benzo(a)anthracene	**0.025 U**	mg/kg	0.19	0.025	1	11/17/22 17:16	11/18/22 16:46	56-55-3	P1

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 8 Comp 248 **Lab ID: 35760275008** Collected: 11/15/22 10:15 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546 Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.046 U**	mg/kg	0.19	0.046	1	11/17/22 17:16	11/18/22 16:46	50-32-8	P1
Benzo(b)fluoranthene	**0.050 U**	mg/kg	0.19	0.050	1	11/17/22 17:16	11/18/22 16:46	205-99-2	P1
Benzo(g,h,i)perylene	**0.047 U**	mg/kg	0.19	0.047	1	11/17/22 17:16	11/18/22 16:46	191-24-2	P1
Benzo(k)fluoranthene	**0.050 U**	mg/kg	0.19	0.050	1	11/17/22 17:16	11/18/22 16:46	207-08-9	P1
Chrysene	**0.025 U**	mg/kg	0.19	0.025	1	11/17/22 17:16	11/18/22 16:46	218-01-9	P1
Dibenz(a,h)anthracene	**0.043 U**	mg/kg	0.19	0.043	1	11/17/22 17:16	11/18/22 16:46	53-70-3	P1
Fluoranthene	**0.061 U**	mg/kg	0.19	0.061	1	11/17/22 17:16	11/18/22 16:46	206-44-0	P1
Fluorene	**0.066 U**	mg/kg	0.20	0.066	1	11/17/22 17:16	11/18/22 16:46	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.043 U**	mg/kg	0.19	0.043	1	11/17/22 17:16	11/18/22 16:46	193-39-5	P1
1-Methylnaphthalene	**0.031 U**	mg/kg	0.22	0.031	1	11/17/22 17:16	11/18/22 16:46	90-12-0	P1
2-Methylnaphthalene	**0.029 U**	mg/kg	0.22	0.029	1	11/17/22 17:16	11/18/22 16:46	91-57-6	P1
Naphthalene	**0.066 U**	mg/kg	0.19	0.066	1	11/17/22 17:16	11/18/22 16:46	91-20-3	P1
Phenanthrene	**0.027 U**	mg/kg	0.19	0.027	1	11/17/22 17:16	11/18/22 16:46	85-01-8	P1
Pyrene	**0.025 U**	mg/kg	0.19	0.025	1	11/17/22 17:16	11/18/22 16:46	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	46	%	24-98		1	11/17/22 17:16	11/18/22 16:46	4165-60-0	
2-Fluorobiphenyl (S)	71	%	29-101		1	11/17/22 17:16	11/18/22 16:46	321-60-8	
p-Terphenyl-d14 (S)	77	%	29-112		1	11/17/22 17:16	11/18/22 16:46	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Ormond Beach								
Percent Moisture	**33.6**	%	0.10	0.10	1		11/17/22 11:37		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**675**	mg/kg	30.1	16.6	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2 Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**675**	mg/kg	150	82.7	1	11/21/22 10:59	11/25/22 14:47	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2 Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.38 U**	mg/kg	0.76	0.38	1	11/19/22 20:30	11/19/22 22:13		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4 Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**43.3 I**	mg/kg	45.1	39.1	1	11/21/22 10:59	11/25/22 14:47	7723-14-0	

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 8 Comp 659 **Lab ID: 35760275009** Collected: 11/15/22 11:45 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Petroleum Range Organics	**59.2**	mg/kg	13.6	11.7	1	11/17/22 10:23	11/19/22 03:34		P1
Surrogates									
o-Terphenyl (S)	98	%	66-136		1	11/17/22 10:23	11/19/22 03:34	84-15-1	
N-Pentatriacontane (S)	108	%	42-159		1	11/17/22 10:23	11/19/22 03:34	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
	Pace Analytical Services - Ormond Beach								
Arsenic	**4.1**	mg/kg	0.76	0.38	1	11/22/22 14:46	11/22/22 22:41	7440-38-2	
Barium	**2.2**	mg/kg	0.76	0.13	1	11/22/22 14:46	11/22/22 22:41	7440-39-3	
Cadmium	**0.11**	mg/kg	0.076	0.038	1	11/22/22 14:46	11/22/22 22:41	7440-43-9	
Chromium	**4.6**	mg/kg	0.38	0.19	1	11/22/22 14:46	11/22/22 22:41	7440-47-3	
Copper	**26.8**	mg/kg	0.38	0.19	1	11/22/22 14:46	11/22/22 22:41	7440-50-8	
Lead	**37.2**	mg/kg	0.76	0.38	1	11/22/22 14:46	11/22/22 22:41	7439-92-1	
Selenium	**1.5**	mg/kg	1.1	0.57	1	11/22/22 14:46	11/22/22 22:41	7782-49-2	
Silver	**0.083 U**	mg/kg	0.38	0.083	1	11/22/22 14:46	11/22/22 22:41	7440-22-4	
6010 MET ICP, TCLP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Arsenic	**0.034 U**	mg/L	0.10	0.034	1	11/21/22 11:54	11/22/22 06:04	7440-38-2	
Barium	**0.029 I**	mg/L	0.10	0.0084	1	11/21/22 11:54	11/22/22 06:04	7440-39-3	
Cadmium	**0.0033 U**	mg/L	0.010	0.0033	1	11/21/22 11:54	11/22/22 06:04	7440-43-9	
Chromium	**0.017 U**	mg/L	0.050	0.017	1	11/21/22 11:54	11/22/22 06:04	7440-47-3	
Copper	**0.026 U**	mg/L	0.050	0.026	1	11/21/22 11:54	11/22/22 06:04	7440-50-8	
Lead	**0.021 U**	mg/L	0.10	0.021	1	11/21/22 11:54	11/22/22 06:04	7439-92-1	
Selenium	**0.039 U**	mg/L	0.15	0.039	1	11/21/22 11:54	11/22/22 06:04	7782-49-2	
Silver	**0.010 U**	mg/L	0.050	0.010	1	11/21/22 11:54	11/22/22 06:04	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
	Leachate Method/Date: EPA 1311; 11/20/22 12:30								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.00090 U**	mg/L	0.0020	0.00090	1	11/21/22 12:13	11/22/22 10:14	7439-97-6	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
	Pace Analytical Services - Ormond Beach								
Mercury	**0.021**	mg/kg	0.014	0.0068	1	11/18/22 09:16	11/21/22 11:39	7439-97-6	
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Acenaphthene	**0.076 U**	mg/kg	0.17	0.076	1	11/17/22 17:16	11/18/22 17:12	83-32-9	P1
Acenaphthylene	**0.025 U**	mg/kg	0.16	0.025	1	11/17/22 17:16	11/18/22 17:12	208-96-8	P1
Anthracene	**0.022 U**	mg/kg	0.17	0.022	1	11/17/22 17:16	11/18/22 17:12	120-12-7	P1
Benzo(a)anthracene	**0.063 I**	mg/kg	0.16	0.021	1	11/17/22 17:16	11/18/22 17:12	56-55-3	P1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Sample: LAKE 8 Comp 659 **Lab ID: 35760275009** Collected: 11/15/22 11:45 Received: 11/16/22 15:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV Short List Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
	Pace Analytical Services - Ormond Beach								
Benzo(a)pyrene	**0.067 I**	mg/kg	0.16	0.040	1	11/17/22 17:16	11/18/22 17:12	50-32-8	P1
Benzo(b)fluoranthene	**0.10 I**	mg/kg	0.16	0.043	1	11/17/22 17:16	11/18/22 17:12	205-99-2	P1
Benzo(g,h,i)perylene	**0.049 I**	mg/kg	0.16	0.040	1	11/17/22 17:16	11/18/22 17:12	191-24-2	P1
Benzo(k)fluoranthene	**0.043 U**	mg/kg	0.16	0.043	1	11/17/22 17:16	11/18/22 17:12	207-08-9	P1
Chrysene	**0.074 I**	mg/kg	0.16	0.021	1	11/17/22 17:16	11/18/22 17:12	218-01-9	P1
Dibenz(a,h)anthracene	**0.037 U**	mg/kg	0.16	0.037	1	11/17/22 17:16	11/18/22 17:12	53-70-3	P1
Fluoranthene	**0.13 I**	mg/kg	0.16	0.052	1	11/17/22 17:16	11/18/22 17:12	206-44-0	P1
Fluorene	**0.057 U**	mg/kg	0.18	0.057	1	11/17/22 17:16	11/18/22 17:12	86-73-7	P1
Indeno(1,2,3-cd)pyrene	**0.039 I**	mg/kg	0.16	0.037	1	11/17/22 17:16	11/18/22 17:12	193-39-5	P1
1-Methylnaphthalene	**0.027 U**	mg/kg	0.19	0.027	1	11/17/22 17:16	11/18/22 17:12	90-12-0	P1
2-Methylnaphthalene	**0.025 U**	mg/kg	0.19	0.025	1	11/17/22 17:16	11/18/22 17:12	91-57-6	P1
Naphthalene	**0.057 U**	mg/kg	0.17	0.057	1	11/17/22 17:16	11/18/22 17:12	91-20-3	P1
Phenanthrene	**0.023 U**	mg/kg	0.16	0.023	1	11/17/22 17:16	11/18/22 17:12	85-01-8	P1
Pyrene	**0.094 I**	mg/kg	0.16	0.021	1	11/17/22 17:16	11/18/22 17:12	129-00-0	P1
Surrogates									
Nitrobenzene-d5 (S)	46	%	24-98		1	11/17/22 17:16	11/18/22 17:12	4165-60-0	
2-Fluorobiphenyl (S)	69	%	29-101		1	11/17/22 17:16	11/18/22 17:12	321-60-8	
p-Terphenyl-d14 (S)	75	%	29-112		1	11/17/22 17:16	11/18/22 17:12	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
	Pace Analytical Services - Ormond Beach								
Percent Moisture	**27.9**	%	0.10	0.10	1		11/17/22 11:37		
Total Nitrogen Calculation	Analytical Method: TKN+NOx Calculation								
	Pace Analytical Services - Ormond Beach								
Total Nitrogen Soil	**755**	mg/kg	27.7	15.3	1		12/05/22 15:17		
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2 Preparation Method: EPA 351.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, Kjeldahl, Total	**755**	mg/kg	138	76.1	1	11/21/22 10:59	11/25/22 14:49	7727-37-9	
353.2 Nitrogen, NOx	Analytical Method: EPA 353.2 Preparation Method: EPA 353.2								
	Pace Analytical Services - Ormond Beach								
Nitrogen, NO2 plus NO3	**0.35 U**	mg/kg	0.69	0.35	1	11/19/22 20:30	11/19/22 22:14		
365.4 Phosphorus, Total	Analytical Method: EPA 365.4 Preparation Method: EPA 365.4								
	Pace Analytical Services - Ormond Beach								
Phosphorus, Total (as P)	**140**	mg/kg	41.5	36.0	1	11/21/22 10:59	11/25/22 14:49	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 873344
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury TCLP
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4806585 Matrix: Water
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/L	0.000090 U	0.00020	0.000090	11/22/22 09:31	

LABORATORY CONTROL SAMPLE: 4807262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.002	0.0020	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4807263 4807264

Parameter	Units	35759656001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	0.0012 I	0.02	0.02	0.019	0.019	90	90	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 872727
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4804242 Matrix: Solid
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	0.0047 U	0.0094	0.0047	11/21/22 10:45	

LABORATORY CONTROL SAMPLE: 4804243

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.093	0.096	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4804244 4804245

Parameter	Units	35759993001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.012	0.12	0.11	0.14	0.12	105	100	80-120	13	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 873831
QC Batch Method: EPA 3050
Analysis Method: EPA 6010
Analysis Description: 6010 MET Solid
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4809686 Matrix: Solid
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	0.25 U	0.50	0.25	11/22/22 21:43	
Barium	mg/kg	0.083 U	0.50	0.083	11/22/22 21:43	
Cadmium	mg/kg	0.025 U	0.050	0.025	11/22/22 21:43	
Chromium	mg/kg	0.12 U	0.25	0.12	11/22/22 21:43	
Copper	mg/kg	0.12 U	0.25	0.12	11/22/22 21:43	
Lead	mg/kg	0.25 U	0.50	0.25	11/22/22 21:43	
Selenium	mg/kg	0.37 U	0.74	0.37	11/22/22 21:43	
Silver	mg/kg	0.055 U	0.25	0.055	11/22/22 21:43	

LABORATORY CONTROL SAMPLE: 4809687

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	11.8	11.1	94	80-120	
Barium	mg/kg	11.8	12.4	105	80-120	
Cadmium	mg/kg	1.2	1.2	99	80-120	
Chromium	mg/kg	11.8	12.3	104	80-120	
Copper	mg/kg	11.8	12.0	102	80-120	
Lead	mg/kg	11.8	11.8	100	80-120	
Selenium	mg/kg	11.8	10.2	86	80-120	
Silver	mg/kg	1.2	1.2	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4809688 4809689

Parameter	Units	35760275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	5.2	25.1	27.1	28.3	28.9	92	88	75-125	2	20	
Barium	mg/kg	1.3	25.1	27.1	28.7	29.9	109	106	75-125	4	20	
Cadmium	mg/kg	0.30	2.6	2.7	2.7	3.1	97	105	75-125	14	20	
Chromium	mg/kg	2.6	25.1	27.1	28.9	30.0	105	101	75-125	4	20	
Copper	mg/kg	114	25.1	27.1	136	107	86	-27	75-125	24	20	J(M1), J(R1)
Lead	mg/kg	2.8	25.1	27.1	27.5	28.8	98	96	75-125	4	20	
Selenium	mg/kg	0.66 U	25.1	27.1	21.8	23.4	86	85	75-125	7	20	
Silver	mg/kg	0.097 U	2.6	2.7	2.5	2.7	99	99	75-125	7	20	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 873399 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET TCLP
Laboratory: Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4806585 Matrix: Water

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.0034 U	0.010	0.0034	11/22/22 04:29	
Barium	mg/L	0.0019 I	0.010	0.00084	11/22/22 04:29	
Cadmium	mg/L	0.00033 U	0.0010	0.00033	11/22/22 04:29	
Chromium	mg/L	0.0017 U	0.0050	0.0017	11/22/22 04:29	
Copper	mg/L	0.0026 U	0.0050	0.0026	11/22/22 04:29	
Lead	mg/L	0.0021 U	0.010	0.0021	11/22/22 04:29	
Selenium	mg/L	0.010 I	0.015	0.0039	11/22/22 04:29	
Silver	mg/L	0.0010 U	0.0050	0.0010	11/22/22 04:29	

LABORATORY CONTROL SAMPLE: 4807474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	0.25	0.25	101	80-120	
Barium	mg/L	0.25	0.27	109	80-120	
Cadmium	mg/L	0.025	0.023	91	80-120	
Chromium	mg/L	0.25	0.25	100	80-120	
Copper	mg/L	0.25	0.28	113	80-120	
Lead	mg/L	0.25	0.22	90	80-120	
Selenium	mg/L	0.25	0.28	113	80-120	
Silver	mg/L	0.025	0.028	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4807475 4807476

Parameter	Units	35760275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	0.034 U	2.5	2.5	2.4	2.4	94	95	75-125	1	20	
Barium	mg/L	0.011 I	2.5	2.5	2.7	2.8	109	111	75-125	1	20	
Cadmium	mg/L	0.0033 U	0.25	0.25	0.24	0.24	95	96	75-125	1	20	
Chromium	mg/L	0.017 U	2.5	2.5	2.5	2.5	100	102	75-125	2	20	
Copper	mg/L	0.026 U	2.5	2.5	2.6	2.6	102	103	75-125	2	20	
Lead	mg/L	0.021 U	2.5	2.5	2.4	2.5	98	98	75-125	1	20	
Selenium	mg/L	0.039 U	2.5	2.5	2.4	2.5	97	98	75-125	1	20	
Silver	mg/L	0.010 U	0.25	0.25	0.25	0.25	100	101	75-125	1	20	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 872578 — Analysis Method: EPA 8270
QC Batch Method: EPA 3546 — Analysis Description: 8270 Solid MSSV Microwave Short Spike
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4803221 — Matrix: Solid
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	mg/kg	0.0056 U	0.040	0.0056	11/18/22 09:46	
2-Methylnaphthalene	mg/kg	0.0053 U	0.039	0.0053	11/18/22 09:46	
Acenaphthene	mg/kg	0.016 U	0.036	0.016	11/18/22 09:46	
Acenaphthylene	mg/kg	0.0053 U	0.034	0.0053	11/18/22 09:46	
Anthracene	mg/kg	0.0046 U	0.036	0.0046	11/18/22 09:46	
Benzo(a)anthracene	mg/kg	0.0045 U	0.034	0.0045	11/18/22 09:46	
Benzo(a)pyrene	mg/kg	0.0084 U	0.034	0.0084	11/18/22 09:46	
Benzo(b)fluoranthene	mg/kg	0.0090 U	0.034	0.0090	11/18/22 09:46	
Benzo(g,h,i)perylene	mg/kg	0.0085 U	0.034	0.0085	11/18/22 09:46	
Benzo(k)fluoranthene	mg/kg	0.0090 U	0.034	0.0090	11/18/22 09:46	
Chrysene	mg/kg	0.0045 U	0.034	0.0045	11/18/22 09:46	
Dibenz(a,h)anthracene	mg/kg	0.0078 U	0.034	0.0078	11/18/22 09:46	
Fluoranthene	mg/kg	0.011 U	0.034	0.011	11/18/22 09:46	
Fluorene	mg/kg	0.012 U	0.037	0.012	11/18/22 09:46	
Indeno(1,2,3-cd)pyrene	mg/kg	0.0077 U	0.034	0.0077	11/18/22 09:46	
Naphthalene	mg/kg	0.012 U	0.035	0.012	11/18/22 09:46	
Phenanthrene	mg/kg	0.0048 U	0.034	0.0048	11/18/22 09:46	
Pyrene	mg/kg	0.0045 U	0.034	0.0045	11/18/22 09:46	
2-Fluorobiphenyl (S)	%	68	29-101		11/18/22 09:46	
Nitrobenzene-d5 (S)	%	65	24-98		11/18/22 09:46	
p-Terphenyl-d14 (S)	%	87	29-112		11/18/22 09:46	

LABORATORY CONTROL SAMPLE: 4803222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	mg/kg	1.7	1.2	73	38-115	
2-Methylnaphthalene	mg/kg	1.7	1.2	70	37-115	
Acenaphthene	mg/kg	1.7	1.1	68	30-127	
Acenaphthylene	mg/kg	1.7	1.2	70	29-129	
Anthracene	mg/kg	1.7	1.2	73	37-126	
Benzo(a)anthracene	mg/kg	1.7	1.3	77	37-130	
Benzo(a)pyrene	mg/kg	1.7	1.4	82	39-128	
Benzo(b)fluoranthene	mg/kg	1.7	1.2	71	38-128	
Benzo(g,h,i)perylene	mg/kg	1.7	1.3	80	34-136	
Benzo(k)fluoranthene	mg/kg	1.7	1.3	81	39-133	
Chrysene	mg/kg	1.7	1.3	81	39-125	
Dibenz(a,h)anthracene	mg/kg	1.7	1.3	81	37-127	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

LABORATORY CONTROL SAMPLE: 4803222

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoranthene	mg/kg	1.7	1.4	82	39-130	
Fluorene	mg/kg	1.7	1.2	74	35-125	
Indeno(1,2,3-cd)pyrene	mg/kg	1.7	1.2	74	35-133	
Naphthalene	mg/kg	1.7	1.1	67	36-115	
Phenanthrene	mg/kg	1.7	1.2	74	35-128	
Pyrene	mg/kg	1.7	1.3	77	37-132	
2-Fluorobiphenyl (S)	%			71	29-101	
Nitrobenzene-d5 (S)	%			65	24-98	
p-Terphenyl-d14 (S)	%			84	29-112	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4803223 4803224

Parameter	Units	35757563001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1-Methylnaphthalene	mg/kg	0.0059 U	1.8	1.8	1.2	1.2	70	67	38-115	5	40	
2-Methylnaphthalene	mg/kg	0.0056 U	1.8	1.8	1.2	1.1	68	65	37-115	5	40	
Acenaphthene	mg/kg	0.017 U	1.8	1.8	1.2	1.2	69	66	30-127	4	40	
Acenaphthylene	mg/kg	0.0056 U	1.8	1.8	1.2	1.2	70	67	29-129	4	40	
Anthracene	mg/kg	0.0049 U	1.8	1.8	1.3	1.3	75	72	37-126	4	40	
Benzo(a)anthracene	mg/kg	0.0048 U	1.8	1.8	1.4	1.3	77	74	37-130	3	40	
Benzo(a)pyrene	mg/kg	0.0089 U	1.8	1.8	1.4	1.4	80	78	39-128	2	40	
Benzo(b)fluoranthene	mg/kg	0.0095 U	1.8	1.8	1.2	1.2	68	67	38-128	2	40	
Benzo(g,h,i)perylene	mg/kg	0.0090 U	1.8	1.8	1.5	1.4	85	80	34-136	5	40	
Benzo(k)fluoranthene	mg/kg	0.0095 U	1.8	1.8	1.4	1.3	78	76	39-133	2	40	
Chrysene	mg/kg	0.0048 U	1.8	1.8	1.4	1.4	79	77	39-125	3	40	
Dibenz(a,h)anthracene	mg/kg	0.0083 U	1.8	1.8	1.5	1.4	84	81	37-127	4	40	
Fluoranthene	mg/kg	0.012 U	1.8	1.8	1.4	1.3	79	76	39-130	4	40	
Fluorene	mg/kg	0.013 U	1.8	1.8	1.3	1.3	75	71	35-125	5	40	
Indeno(1,2,3-cd)pyrene	mg/kg	0.0082 U	1.8	1.8	1.4	1.3	78	75	35-133	3	40	
Naphthalene	mg/kg	0.013 U	1.8	1.8	1.1	1.1	65	62	36-115	5	40	
Phenanthrene	mg/kg	0.0051 U	1.8	1.8	1.4	1.3	76	73	35-128	4	40	
Pyrene	mg/kg	0.0048 U	1.8	1.8	1.3	1.3	76	73	37-132	4	40	
2-Fluorobiphenyl (S)	%						73	70	29-101			
Nitrobenzene-d5 (S)	%						62	59	24-98			
p-Terphenyl-d14 (S)	%						82	78	29-112			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 872292 | Analysis Method: FL-PRO
QC Batch Method: EPA 3546 | Analysis Description: FL-PRO Soil
Laboratory: Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4801613 Matrix: Solid

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Petroleum Range Organics	mg/kg	5.2 U	6.0	5.2	11/19/22 00:57	
N-Pentatriacontane (S)	%	97	42-159		11/19/22 00:57	
o-Terphenyl (S)	%	82	66-136		11/19/22 00:57	

LABORATORY CONTROL SAMPLE: 4801614

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Petroleum Range Organics	mg/kg	200	197	99	65-119	
N-Pentatriacontane (S)	%			107	42-159	
o-Terphenyl (S)	%			83	66-136	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4801615 4801616

Parameter	Units	35760004006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Petroleum Range Organics	mg/kg	54.9	231	231	259	273	88	94	39-181	5	25	
N-Pentatriacontane (S)	%						110	113	42-159			
o-Terphenyl (S)	%						97	86	66-136			

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 872308
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004

SAMPLE DUPLICATE: 4801661

Parameter	Units	35756946003 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	85.4	86.3	1	10	

SAMPLE DUPLICATE: 4801662

Parameter	Units	35759237005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.9	13.0	0	10	

SAMPLE DUPLICATE: 4801663

Parameter	Units	35759237015 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.6	12.5	9	10	

SAMPLE DUPLICATE: 4801664

Parameter	Units	35759656001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	17.4	17.6	1	10	

SAMPLE DUPLICATE: 4801665

Parameter	Units	35760275004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	63.6	69.6	9	10	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 872417 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

SAMPLE DUPLICATE: 4802156

Parameter	Units	35756928001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	80.9	79.0	2	10	

SAMPLE DUPLICATE: 4802158

Parameter	Units	35760004006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	13.5	13.8	2	10	

SAMPLE DUPLICATE: 4802159

Parameter	Units	35760275005 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	59.4	58.2	2	10	

SAMPLE DUPLICATE: 4802193

Parameter	Units	35759993001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	18.1	17.7	3	10	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 873213
QC Batch Method: EPA 351.2
Analysis Method: EPA 351.2
Analysis Description: 351.2 TKN
Laboratory: Pace Analytical Services - Ormond Beach
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4806883 Matrix: Solid
Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	51.6 U	93.8	51.6	11/25/22 14:33	

LABORATORY CONTROL SAMPLE: 4806884

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/kg	3360	3210	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4806886 4806885

Parameter	Units	35760275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/kg	983	7290	7310	8010	7940	96	95	90-110	1	20	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch:	873138	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrogen, NOx
		Laboratory:	Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4806508 Matrix: Solid

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/kg	0.25 U	0.50	0.25	11/19/22 21:58	

LABORATORY CONTROL SAMPLE: 4806509

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/kg	20	19.9	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4806511 4806510

Parameter	Units	35760275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/kg	0.46 U	36.5	36.5	33.8	33.5	93	92	80-120	1	20	

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QUALITY CONTROL DATA

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

QC Batch: 873212 | Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 | Analysis Description: 365.4 Total Phosphorus
Laboratory: Pace Analytical Services - Ormond Beach

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

METHOD BLANK: 4806877 Matrix: Solid

Associated Lab Samples: 35760275001, 35760275002, 35760275003, 35760275004, 35760275005, 35760275006, 35760275007, 35760275008, 35760275009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus, Total (as P)	mg/kg	24.4 U	28.1	24.4	11/25/22 14:50	

LABORATORY CONTROL SAMPLE: 4806878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus, Total (as P)	mg/kg	673	675	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4806880 4806879

Parameter	Units	35760275001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus, Total (as P)	mg/kg	59.4	1460	1460	1560	1560	103	102	80-120	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 4806882 4806881

Parameter	Units	35760398001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus, Total (as P)	mg/kg	20100	90500	90700	115000	114000	104	104	80-120	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

QUALIFIERS

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Compound was analyzed for but not detected.
J(M1)	Estimated Value. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
J(R1)	Estimated Value. RPD value was outside control limits.
P1	Routine initial sample volume or weight was not used for extraction, resulting in elevated reporting limits.

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35760275001	**LAKE 9 Comp 134**	EPA 3546	872292	FL-PRO	872574
35760275002	**LAKE 9 Comp 256**	EPA 3546	872292	FL-PRO	872574
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 3546	872292	FL-PRO	872574
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 3546	872292	FL-PRO	872574
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 3546	872292	FL-PRO	872574
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 3546	872292	FL-PRO	872574
35760275007	**LAKE 8 Comp 137**	EPA 3546	872292	FL-PRO	872574
35760275008	**LAKE 8 Comp 248**	EPA 3546	872292	FL-PRO	872574
35760275009	**LAKE 8 Comp 659**	EPA 3546	872292	FL-PRO	872574
35760275001	**LAKE 9 Comp 134**	EPA 3050	873831	EPA 6010	873906
35760275002	**LAKE 9 Comp 256**	EPA 3050	873831	EPA 6010	873906
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 3050	873831	EPA 6010	873906
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 3050	873831	EPA 6010	873906
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 3050	873831	EPA 6010	873906
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 3050	873831	EPA 6010	873906
35760275007	**LAKE 8 Comp 137**	EPA 3050	873831	EPA 6010	873906
35760275008	**LAKE 8 Comp 248**	EPA 3050	873831	EPA 6010	873906
35760275009	**LAKE 8 Comp 659**	EPA 3050	873831	EPA 6010	873906
35760275001	**LAKE 9 Comp 134**	EPA 3010	873399	EPA 6010	873479
35760275002	**LAKE 9 Comp 256**	EPA 3010	873399	EPA 6010	873479
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 3010	873399	EPA 6010	873479
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 3010	873399	EPA 6010	873479
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 3010	873399	EPA 6010	873479
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 3010	873399	EPA 6010	873479
35760275007	**LAKE 8 Comp 137**	EPA 3010	873399	EPA 6010	873479
35760275008	**LAKE 8 Comp 248**	EPA 3010	873399	EPA 6010	873479
35760275009	**LAKE 8 Comp 659**	EPA 3010	873399	EPA 6010	873479
35760275001	**LAKE 9 Comp 134**	EPA 7470	873344	EPA 7470	873493
35760275002	**LAKE 9 Comp 256**	EPA 7470	873344	EPA 7470	873493
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 7470	873344	EPA 7470	873493
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 7470	873344	EPA 7470	873493
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 7470	873344	EPA 7470	873493
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 7470	873344	EPA 7470	873493
35760275007	**LAKE 8 Comp 137**	EPA 7470	873344	EPA 7470	873493
35760275008	**LAKE 8 Comp 248**	EPA 7470	873344	EPA 7470	873493
35760275009	**LAKE 8 Comp 659**	EPA 7470	873344	EPA 7470	873493
35760275001	**LAKE 9 Comp 134**	EPA 7471	872727	EPA 7471	872784
35760275002	**LAKE 9 Comp 256**	EPA 7471	872727	EPA 7471	872784
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 7471	872727	EPA 7471	872784
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 7471	872727	EPA 7471	872784
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 7471	872727	EPA 7471	872784
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 7471	872727	EPA 7471	872784
35760275007	**LAKE 8 Comp 137**	EPA 7471	872727	EPA 7471	872784
35760275008	**LAKE 8 Comp 248**	EPA 7471	872727	EPA 7471	872784
35760275009	**LAKE 8 Comp 659**	EPA 7471	872727	EPA 7471	872784
35760275001	**LAKE 9 Comp 134**	EPA 3546	872578	EPA 8270	872694

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35760275002	**LAKE 9 Comp 256**	EPA 3546	872578	EPA 8270	872694
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 3546	872578	EPA 8270	872694
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 3546	872578	EPA 8270	872694
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 3546	872578	EPA 8270	872694
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 3546	872578	EPA 8270	872694
35760275007	**LAKE 8 Comp 137**	EPA 3546	872578	EPA 8270	872694
35760275008	**LAKE 8 Comp 248**	EPA 3546	872578	EPA 8270	872694
35760275009	**LAKE 8 Comp 659**	EPA 3546	872578	EPA 8270	872694
35760275001	**LAKE 9 Comp 134**	ASTM D2974-87	872308		
35760275002	**LAKE 9 Comp 256**	ASTM D2974-87	872308		
35760275003	**LAKE 9 Comp 8 11 12 14**	ASTM D2974-87	872308		
35760275004	**LAKE 9 Comp 17 18 20 21**	ASTM D2974-87	872308		
35760275005	**LAKE 9 Comp 15 16 19 22**	ASTM D2974-87	872417		
35760275006	**LAKE 9 Comp 7 9 10 13**	ASTM D2974-87	872417		
35760275007	**LAKE 8 Comp 137**	ASTM D2974-87	872417		
35760275008	**LAKE 8 Comp 248**	ASTM D2974-87	872417		
35760275009	**LAKE 8 Comp 659**	ASTM D2974-87	872417		
35760275001	**LAKE 9 Comp 134**	TKN+NOx Calculation	876735		
35760275002	**LAKE 9 Comp 256**	TKN+NOx Calculation	876735		
35760275003	**LAKE 9 Comp 8 11 12 14**	TKN+NOx Calculation	876735		
35760275004	**LAKE 9 Comp 17 18 20 21**	TKN+NOx Calculation	876735		
35760275005	**LAKE 9 Comp 15 16 19 22**	TKN+NOx Calculation	876735		
35760275006	**LAKE 9 Comp 7 9 10 13**	TKN+NOx Calculation	876735		
35760275007	**LAKE 8 Comp 137**	TKN+NOx Calculation	876735		
35760275008	**LAKE 8 Comp 248**	TKN+NOx Calculation	876735		
35760275009	**LAKE 8 Comp 659**	TKN+NOx Calculation	876735		
35760275001	**LAKE 9 Comp 134**	EPA 351.2	873213	EPA 351.2	874369
35760275002	**LAKE 9 Comp 256**	EPA 351.2	873213	EPA 351.2	874369
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 351.2	873213	EPA 351.2	874369
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 351.2	873213	EPA 351.2	874369
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 351.2	873213	EPA 351.2	874369
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 351.2	873213	EPA 351.2	874369
35760275007	**LAKE 8 Comp 137**	EPA 351.2	873213	EPA 351.2	874369
35760275008	**LAKE 8 Comp 248**	EPA 351.2	873213	EPA 351.2	874369
35760275009	**LAKE 8 Comp 659**	EPA 351.2	873213	EPA 351.2	874369
35760275001	**LAKE 9 Comp 134**	EPA 353.2	873138	EPA 353.2	873139
35760275002	**LAKE 9 Comp 256**	EPA 353.2	873138	EPA 353.2	873139
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 353.2	873138	EPA 353.2	873139
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 353.2	873138	EPA 353.2	873139
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 353.2	873138	EPA 353.2	873139
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 353.2	873138	EPA 353.2	873139
35760275007	**LAKE 8 Comp 137**	EPA 353.2	873138	EPA 353.2	873139
35760275008	**LAKE 8 Comp 248**	EPA 353.2	873138	EPA 353.2	873139
35760275009	**LAKE 8 Comp 659**	EPA 353.2	873138	EPA 353.2	873139
35760275001	**LAKE 9 Comp 134**	EPA 365.4	873212	EPA 365.4	874370
35760275002	**LAKE 9 Comp 256**	EPA 365.4	873212	EPA 365.4	874370

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
(954)582-4300

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Naples Lake Restoratio
Pace Project No.: 35760275

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35760275003	**LAKE 9 Comp 8 11 12 14**	EPA 365.4	873212	EPA 365.4	874370
35760275004	**LAKE 9 Comp 17 18 20 21**	EPA 365.4	873212	EPA 365.4	874370
35760275005	**LAKE 9 Comp 15 16 19 22**	EPA 365.4	873212	EPA 365.4	874370
35760275006	**LAKE 9 Comp 7 9 10 13**	EPA 365.4	873212	EPA 365.4	874370
35760275007	**LAKE 8 Comp 137**	EPA 365.4	873212	EPA 365.4	874370
35760275008	**LAKE 8 Comp 248**	EPA 365.4	873212	EPA 365.4	874370
35760275009	**LAKE 8 Comp 659**	EPA 365.4	873212	EPA 365.4	874370

ATTACHMENT A

WO# : 35760275

35760275

Pace

CHAIN-OF-CUSTODY / Analytical Request Docum

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be co

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.con

Page : 1 Of 1

Section A
Required Client Information:
Company: WSP USA Environment & Infrastructure Inc.
Address: 5845 NW 158th Street
Hialeah, FL 33014
Email: greg.corning@wsp.com
Phone: (314)920-8359 Fax
Requested Due Date:

Section B
Required Project Information:
Report To: Greg Corning
Copy To:
Purchase Order #:
Project Name: City of Naples Lake Restoration sediment samp
Project #:

Section C
Invoice Information:
Attention:
Company Name:
Address:
Pace Quote:
Pace Project Manager: christina.raschke@pacelabs.com,
Pace Profile #: 8298-5

Regulatory Agency

State / Location: FL

MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	TKN, NOX(TN),TP	Grain/Sieve, Organic/Moisture c	FLPRO, PAH, 8 RCRA + Cu	TCLP 8 RCRA + Cu	Residual Chlorine (Y/N)
1	LAKE 9 comp 134	SL	G	11/14/22	0910				3										x	x	x	x	
2	LAKE 9 comp 256	SL	G		1000				3										x	x	x	x	
3	LAKE 9 comp 8 11 12 14	SL	G		1100				3										x	x	x	x	
4	LAKE 9 Comp 17 18 20 21	SL	G		1305				3										x	x	x	x	
5	LAKE 9 comp 15 16 19 22	SL	G		1420				3										x	x	x	x	
6	LAKE 9 Comp 7 9 10 13	SL	G		1520				3										x	x	x	x	
7	LAKE 8 Comp 137	SL	G	11/15/22	0920				3										x	x	x	x	
8	LAKE 8 Comp 248	SL	G		1015				3										x	x	x	x	
9	LAKE 8 Comp 659	SL	G		1145				3										x	x	x	x	
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature]	11/15/22	1300	NR	11-15-22	1405	4.4	Y	N	Y

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER:
SIGNATURE of SAMPLER: DATE Signed:

ATTACHMENT A

DC#_Title: ENV-FRM-ORB1-0093 Sample Condition Upon Receipt Form
Version: 3 | Effective Date: 12/29/2021 | Issued by: Ormond Beach

Pace

Sample Condition Upon Receipt Form (SCUR)

WO# : 35760275
PM: RL Due Date: 11/22/22
CLIENT: 36-MACTEC

Project #
Project Manager:
Client:

Date and Initials of person:
Examining contents:
Label:
Deliver:
pH:

Thermometer Used: T-399 Date: 11-16-22 Time: 1500 Initials: NPI

State of Origin: ☐ For WV projects, all containers verified to ≤6 °C

Cooler #1 Temp.°C 4.4 (Visual) 0.0 (Correction Factor) 4.4 (Actual) ☐ Samples on ice, cooling process has begun
Cooler #2 Temp.°C ____ (Visual) ____ (Correction Factor) ____ (Actual) ☐ Samples on ice, cooling process has begun
Cooler #3 Temp.°C ____ (Visual) ____ (Correction Factor) ____ (Actual) ☐ Samples on ice, cooling process has begun
Cooler #4 Temp.°C ____ (Visual) ____ (Correction Factor) ____ (Actual) ☐ Samples on ice, cooling process has begun
Cooler #5 Temp.°C ____ (Visual) ____ (Correction Factor) ____ (Actual) ☐ Samples on ice, cooling process has begun
Cooler #6 Temp.°C ____ (Visual) ____ (Correction Factor) ____ (Actual) ☐ Samples on ice, cooling process has begun
Recheck for OOT °C ____ (Visual) ____ (Correction Factor) ____ (Actual) Time: ____ Initials: ____

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other ____
Shipping Method: ☐ First Overnight ☐ Priority Overnight ☐ Standard Overnight ☑ Ground ☐ International Priority ☐ Other ____

Billing: ☐ Recipient ☐ Sender ☑ Third Party ☐ Credit Card ☐ Unknown

Tracking # 3906 7328 8150

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No Seals intact: ☐ Yes ☑ No Ice: Wet Blue Melted None

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other ____

Samples shorted to lab (If Yes, complete) Shorted Date: ____ Shorted Time: ____ Qty: ____

		Comments:
Chain of Custody Present	☑ Yes ☐ No ☐ N/A	
Chain of Custody Filled Out	☑ Yes ☐ No ☐ N/A	
Relinquished Signature & Sampler Name COC	☑ Yes ☐ No ☐ N/A	
Samples Arrived within Hold Time	☑ Yes ☐ No ☐ N/A	
Rush TAT requested on COC	☐ Yes ☑ No ☐ N/A	
Sufficient Volume	☑ Yes ☐ No ☐ N/A	
Correct Containers Used	☑ Yes ☐ No ☐ N/A	
Containers Intact	☐ Yes ☑ No ☐ N/A	
Sample Labels match COC (sample IDs & date/time of collection)	☑ Yes ☐ No ☐ N/A	
All containers needing acid/base preservation have been checked.	☐ Yes ☐ No ☑ N/A	Preservation Information: Preservative: ____ Lot #/Trace #: ____ Date: ____ Time: ____ Initials: ____
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: Vials, Microbiology, O&G, PFAS	☐ Yes ☐ No ☑ N/A	
Headspace in VOA Vials? (>6mm):	☐ Yes ☐ No ☑ N/A	
Trip Blank Present:	☐ Yes ☐ No ☑ N/A	

Comments/ Resolution (use back for additional comments): LAKE 8 COMP 137 1/2 WG9O lid arrived cracked. No leak detected

Qualtrax Document ID: 33786

Pace Analytical
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Date: 11/29/2022

CLIENT:	Pace Analytical Ormond Beach	
Project:	35760275 City of Naples Restoration	
Lab Order:	S2211278	

CASE NARRATIVE

Report ID: S2211278001

Entire Report Reviewed by:

John Jacobs, Project Manager

Samples LAKE 8 Comp 137, LAKE 8 Comp 248, LAKE 8 Comp 659, LAKE 9 Comp 134, LAKE 9 Comp 15 16 19 22, LAKE 9 Comp 17 18 20 21, LAKE 9 Comp 256, LAKE 9 Comp 7 9 10 13 and LAKE 9 Comp 8 11 12 14 were received on November 18, 2022.

All samples were received and analyzed within recommended holding times, except those noted below in this case narrative. Samples were analyzed using methods outlined in the following references:

Standard Methods for the Examination of Water and Wastewater, approved method versions
EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, online versions
EPA methods 40 CFR Parts 136 and 141EPA 600/2-78-054 methods
NDEP Mining Methods
40 CFR Part 50, Appendices B, J, L, O and FEM EQL-0310-189
IO Compendium Methods
Clean Water Act Methods Update Rule for the Analysis of Effluent, current version.
ASTM approved and recognized standards
ISO approved and recognized standards
USDA Handbook 60
Soil Survey Laboratory Manual Ver 4.0
ASA/SSSA 9 Methods of Analysis Part 2, 1982
ASA/SSSA Methods of Analysis Book 5 Part 3, 1996
Other industry approved methods

All Quality Control parameters met the acceptance criteria defined by EPA and Pace Analytical except as indicated in this case narrative:

Pace Analytical
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Date: 11/29/2022

Definitions

RL	Reporting Limit

Qualifiers

*	Value exceeds Maximum Contaminant Level
A	Check MSA specifications
B	Analyte detected in the associated Method Blank
C	Calculated Value
D	Report limit raised due to dilution
E	Value above quantitation range
G	Analyzed at Pace Gillette, WY laboratory
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
L	Analyzed by another laboratory
M	Value exceeds Monthly Ave or MCL or is less than LCL
ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
U	Analyte below method detection limit
X	Matrix Effect

ATTACHMENT A

Pace Analytical
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Soil Analysis Report

Pace Analytical Ormond Beach
8 East Tower Circle
Ormond Beach, FL 32174

Report ID: S2211278001
Date Reported: 11/29/2022
Work Order: S2211278

Project: 35760275
Date Received: 11/18/2022

Lab ID	Sample ID	Percent Moisture %	Organic Matter %
S2211278-001	LAKE 9 Comp 134	31.1	2.2
S2211278-002	LAKE 9 Comp 256	51.6	4.5
S2211278-003	LAKE 9 Comp 8 11 12 14	63.0	2.5
S2211278-004	LAKE 9 Comp 17 18 20 21	57.2	2.1
S2211278-005	LAKE 9 Comp 15 16 19 22	46.7	3.6
S2211278-006	LAKE 9 Comp 7 9 10 13	26.8	0.7
S2211278-007	LAKE 8 Comp 137	51.9	4.3
S2211278-008	LAKE 8 Comp 248	36.3	2.1
S2211278-009	LAKE 8 Comp 659	33.9	2.5

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate

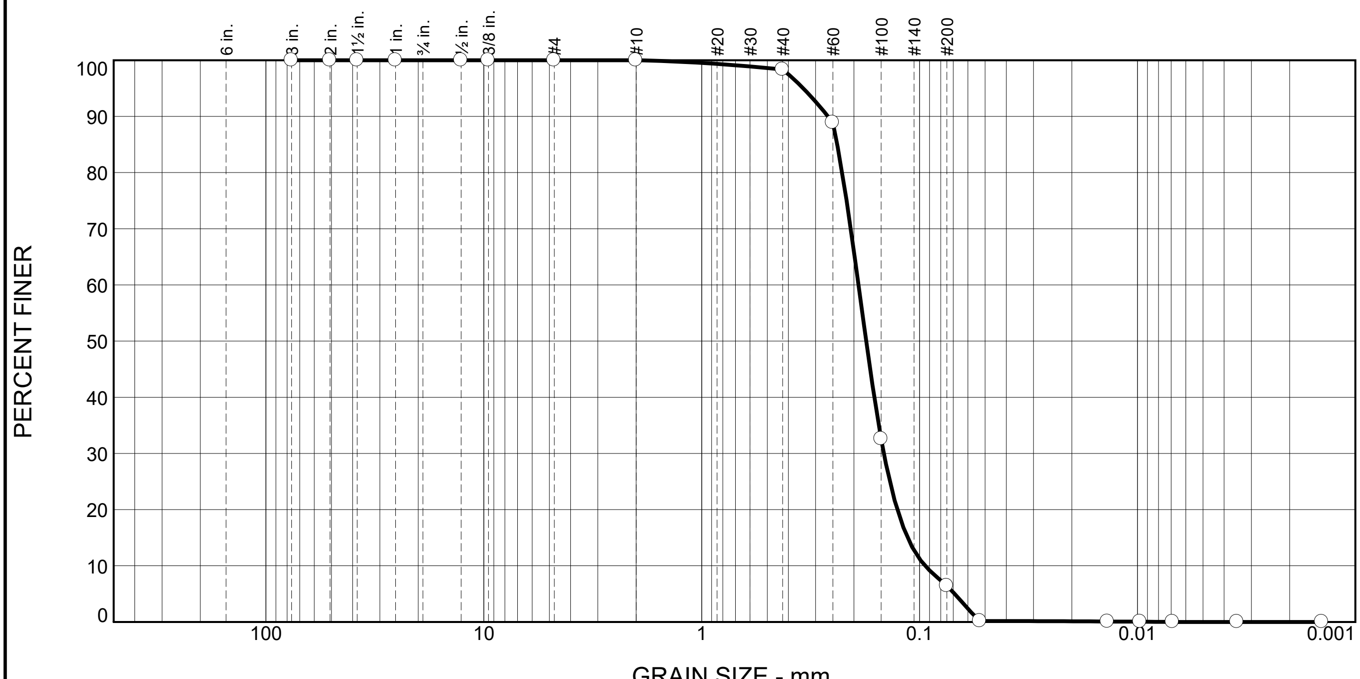
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential

Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: Crystal Herman
Crystal Herman, Mining Supervisor

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.7	91.9	6.4	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	98.3		
#60	88.9		
#100	32.6		
#200	6.4		
0.0528 mm.	0.2		
0.0137 mm.	0.1		
0.0097 mm.	0.0		
0.0069 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.2633 D_{85}= 0.2386 D_{60}= 0.1907
D_{50}= 0.1758 D_{30}= 0.1458 D_{15}= 0.1136
D_{10}= 0.0944 C_u= 2.02 C_c= 1.18

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 134
Sample Number: S2211278-001A
Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275
Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 134
Sample Number: S2211278-001A
Material Description: poorly graded sand with silt
Sample Date: 11/14/2022 9:10
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
107.35	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
78.09	0.00	#40	1.29	0.00	98.3
		#60	7.40	0.00	88.9
		#100	43.97	0.00	32.6
		#200	20.40	0.00	6.4

ATTACHMENT A

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 6.4
Weight of hydrometer sample =78.09
Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	8.0	2.0	0.0136	8.0	15.0	0.0528	0.2
15.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0137	0.1
30.00	20.0	6.5	0.5	0.0136	6.5	15.2	0.0097	0.0
60.00	20.0	6.0	0.0	0.0136	6.0	15.3	0.0069	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

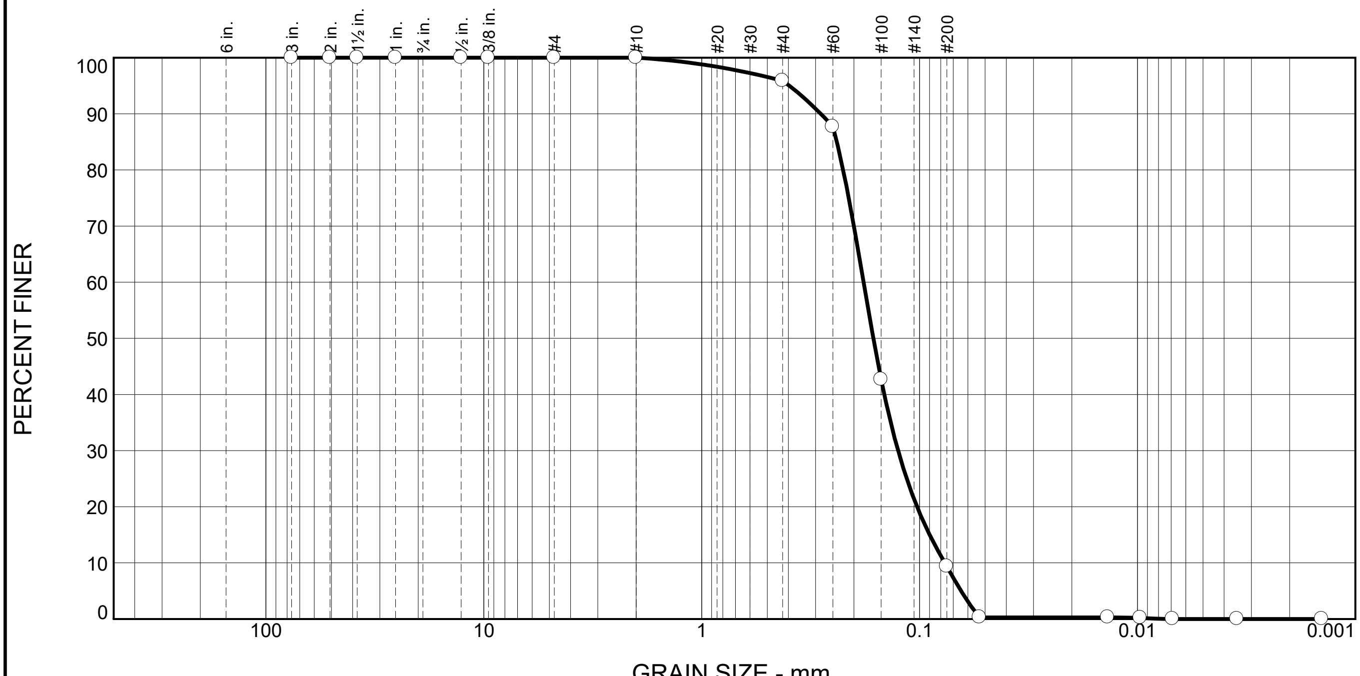
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.7	91.9	93.6	6.4	0.0	6.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0690	0.0944	0.1136	0.1265	0.1458	0.1613	0.1758	0.1907	0.2265	0.2386	0.2633	0.3416

Fineness Modulus	C_u	C_c
0.76	2.02	1.18

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.1	86.5	9.4	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	95.9		
#60	87.7		
#100	42.7		
#200	9.4		
0.0530 mm.	0.3		
0.0137 mm.	0.3		
0.0097 mm.	0.2		
0.0069 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.2841 D_{85}= 0.2395 D_{60}= 0.1806
D_{50}= 0.1629 D_{30}= 0.1255 D_{15}= 0.0899
D_{10}= 0.0766 C_u= 2.36 C_c= 1.14

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 256
Sample Number: S2211278-002A

Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275

Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 256
Sample Number: S2211278-002A
Material Description: poorly graded sand with silt
Sample Date: 11/14/2022 10:00
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
64.06	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
50.15	0.00	#40	2.06	0.00	95.9
		#60	4.10	0.00	87.7
		#100	22.59	0.00	42.7
		#200	16.70	0.00	9.4

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 9.4
Weight of hydrometer sample =50.15
Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	7.5	1.5	0.0136	7.5	15.1	0.0530	0.3
15.00	20.0	7.5	1.5	0.0136	7.5	15.1	0.0137	0.3
30.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0097	0.2
60.00	20.0	6.0	0.0	0.0136	6.0	15.3	0.0069	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

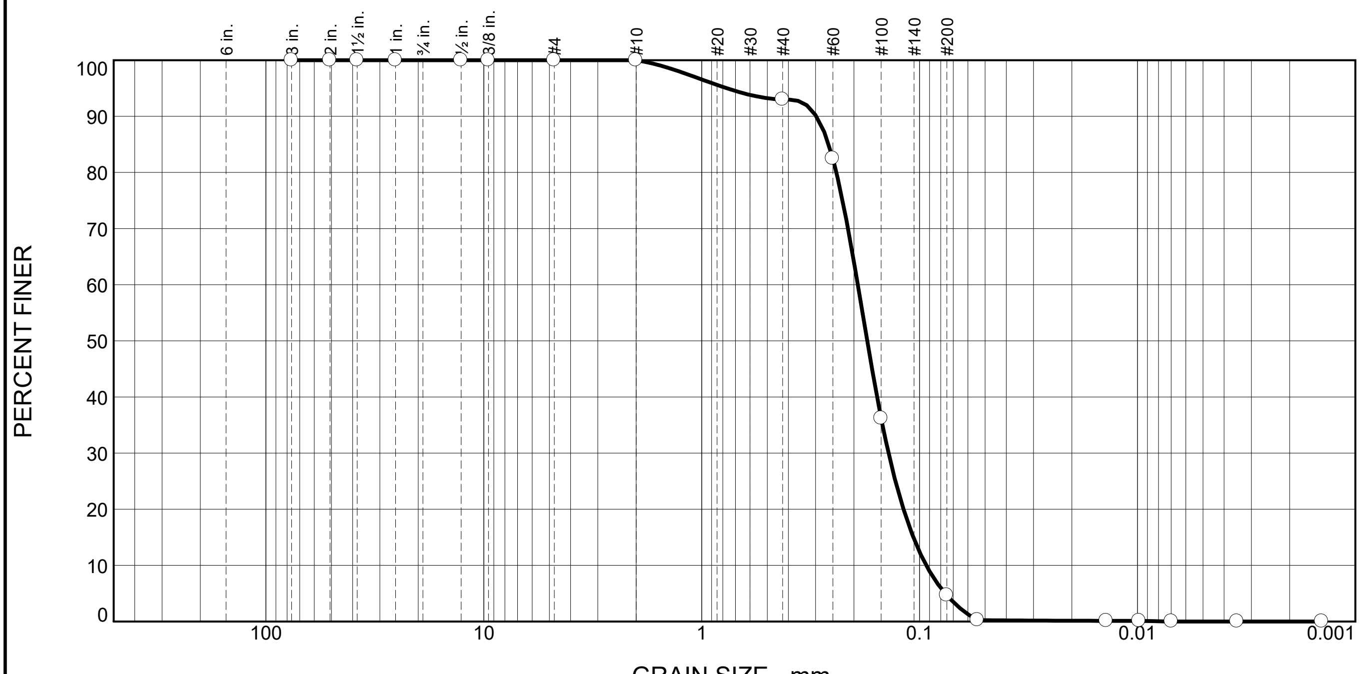
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	4.1	86.5	90.6	9.4	0.0	9.4

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0645	0.0766	0.0899	0.1028	0.1255	0.1451	0.1629	0.1806	0.2241	0.2395	0.2841	0.3959

Fineness Modulus	C_u	C_c
0.70	2.36	1.14

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	7.0	88.3	4.7	0.0

TEST RESULTS (ASTM D 422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	93.0		
#60	82.5		
#100	36.2		
#200	4.7		
0.0542 mm.	0.2		
0.0139 mm.	0.1		
0.0098 mm.	0.1		
0.0070 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.2975 D_{85}= 0.2613 D_{60}= 0.1920
D_{50}= 0.1738 D_{30}= 0.1388 D_{15}= 0.1068
D_{10}= 0.0932 C_u= 2.06 C_c= 1.08

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 8 11 12 14
Sample Number: S2211278-003A
Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275
Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 8 11 12 14
Sample Number: S2211278-003A
Material Description: poorly graded sand
Sample Date: 11/14/2022 11:00
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
39.25	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
39.25	0.00	#40	2.75	0.00	93.0
		#60	4.12	0.00	82.5
		#100	18.18	0.00	36.2
		#200	12.36	0.00	4.7

Pace Analytical Services, Inc.

ATTACHMENT A

Hydrometer Test Data

Hydrometer test uses material passing #200

Percent passing #200 based upon complete sample = 4.7

Weight of hydrometer sample =39.25

Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	18.0	8.0	2.0	0.0140	8.0	15.0	0.0542	0.2
15.00	19.0	7.0	1.0	0.0138	7.0	15.1	0.0139	0.1
30.00	19.0	7.0	1.0	0.0138	7.0	15.1	0.0098	0.1
60.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0070	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	7.0	88.3	95.3	4.7	0.0	4.7

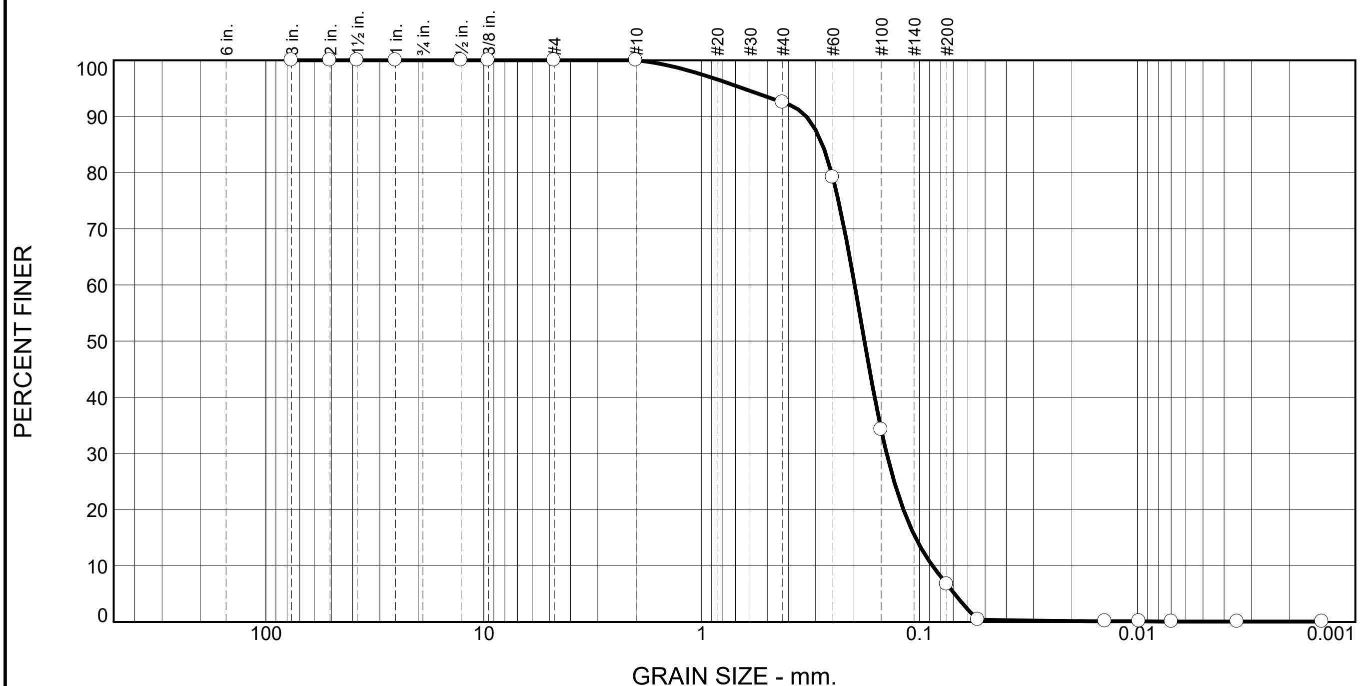
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0762	0.0932	0.1068	0.1186	0.1388	0.1566	0.1738	0.1920	0.2408	0.2613	0.2975	0.7656

Fineness Modulus	C_u	C_c
0.82	2.06	1.08

Pace Analytical Services, Inc.

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	7.5	85.8	6.6	0.1

TEST RESULTS (ASTM D 422)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	92.5		
#60	79.1		
#100	34.3		
#200	6.7		
0.0539 mm.	0.4		
0.0141 mm.	0.1		
0.0098 mm.	0.1		
0.0070 mm.	0.1		
0.0035 mm.	0.1		
0.0014 mm.	0.1		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.3310 D_{85}= 0.2793 D_{60}= 0.1986
D_{50}= 0.1790 D_{30}= 0.1416 D_{15}= 0.1044
D_{10}= 0.0872 C_u= 2.28 C_c= 1.16

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 17 18 20 21
Sample Number: S2211278-004A

Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275

Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 17 18 20 21
Sample Number: S2211278-004A
Material Description: poorly graded sand with silt
Sample Date: 11/14/2022 1:05
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
50.10	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
50.10	0.00	#40	3.76	0.00	92.5
		#60	6.69	0.00	79.1
		#100	22.49	0.00	34.3
		#200	13.79	0.00	6.7

Pace Analytical Services, Inc.

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 6.7
Weight of hydrometer sample =50.10
Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	18.0	9.0	3.0	0.0140	9.0	14.8	0.0539	0.4
15.00	18.0	7.0	1.0	0.0140	7.0	15.1	0.0141	0.1
30.00	19.0	7.0	1.0	0.0138	7.0	15.1	0.0098	0.1
60.00	19.0	6.5	0.5	0.0138	6.5	15.2	0.0070	0.1
240.00	19.0	6.5	0.5	0.0138	6.5	15.2	0.0035	0.1
1440.00	19.0	6.5	0.5	0.0138	6.5	15.2	0.0014	0.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	7.5	85.8	93.3	6.6	0.1	6.7

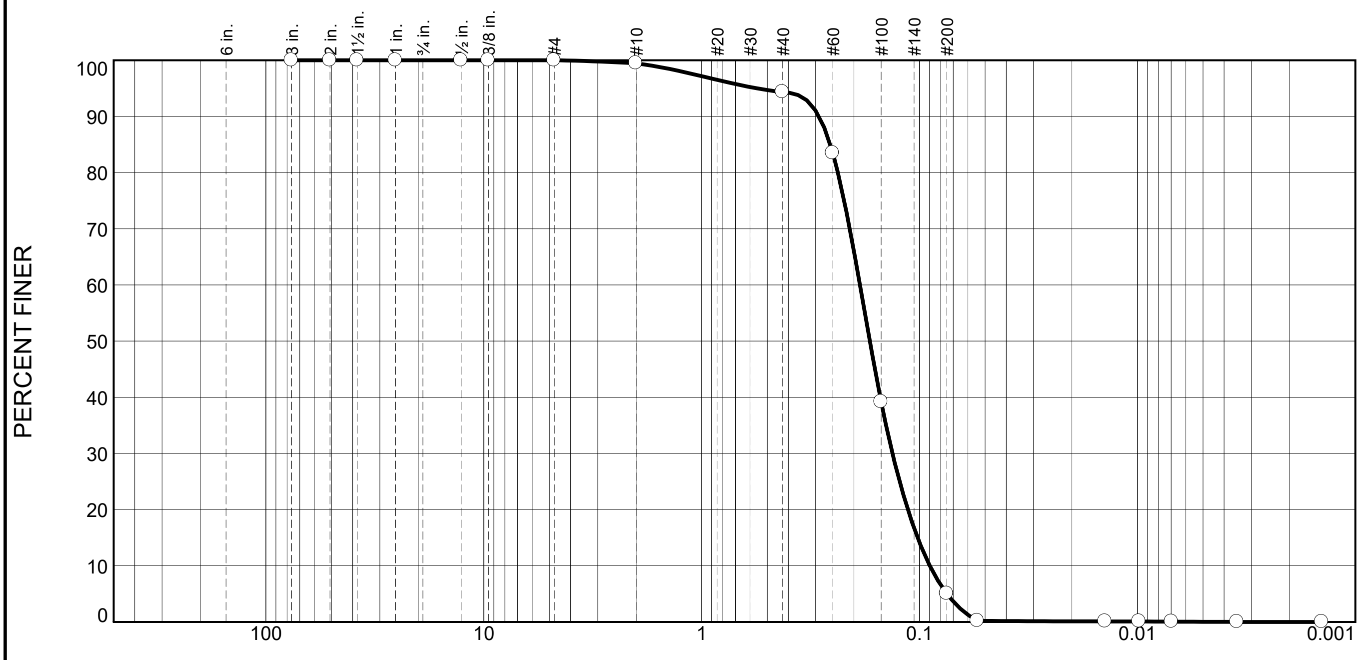
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0691	0.0872	0.1044	0.1186	0.1416	0.1607	0.1790	0.1986	0.2534	0.2793	0.3310	0.6465

Fineness Modulus	C_u	C_c
0.85	2.28	1.16

Pace Analytical Services, Inc.

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	5.2	89.3	5.0	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	99.5		
#40	94.3		
#60	83.5		
#100	39.2		
#200	5.0		
0.0542 mm.	0.2		
0.0141 mm.	0.1		
0.0098 mm.	0.1		
0.0070 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.2894 D_{85}= 0.2569 D_{60}= 0.1877
D_{50}= 0.1691 D_{30}= 0.1332 D_{15}= 0.1021
D_{10}= 0.0897 C_u= 2.09 C_c= 1.05

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 15 16 19 22
Sample Number: S2211278-005A

Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275
Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 15 16 19 22
Sample Number: S2211278-005A
Material Description: poorly graded sand with silt
Sample Date: 11/14/2022 2:20
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
55.02	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.30	0.00	99.5
51.89	0.00	#40	2.67	0.00	94.3
		#60	5.67	0.00	83.5
		#100	23.10	0.00	39.2
		#200	17.82	0.00	5.0

Pace Analytical Services, Inc.

ATTACHMENT A

Hydrometer Test Data

Hydrometer test uses material passing #200

Percent passing #200 based upon complete sample = 5.0

Weight of hydrometer sample =51.89

Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	18.0	8.0	2.0	0.0140	8.0	15.0	0.0542	0.2
15.00	18.0	7.0	1.0	0.0140	7.0	15.1	0.0141	0.1
30.00	19.0	7.0	1.0	0.0138	7.0	15.1	0.0098	0.1
60.00	19.0	6.5	0.5	0.0138	6.5	15.2	0.0070	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.5	5.2	89.3	95.0	5.0	0.0	5.0

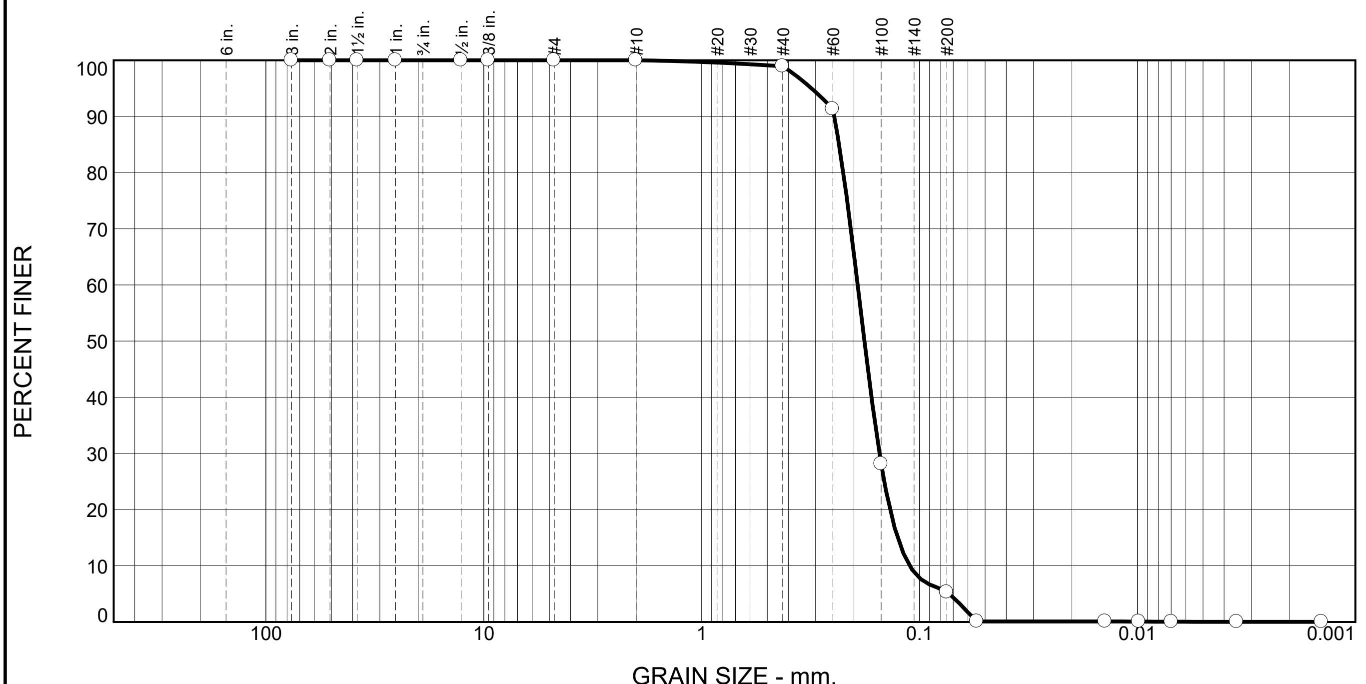
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0749	0.0897	0.1021	0.1132	0.1332	0.1514	0.1691	0.1877	0.2370	0.2569	0.2894	0.5577

Fineness Modulus	C_u	C_c
0.77	2.09	1.05

Pace Analytical Services, Inc.

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.1	93.6	5.3	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	98.9		
#60	91.3		
#100	28.1		
#200	5.3		
0.0545 mm.	0.1		
0.0141 mm.	0.1		
0.0098 mm.	0.1		
0.0070 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.2462 D_{85}= 0.2340 D_{60}= 0.1924
D_{50}= 0.1791 D_{30}= 0.1527 D_{15}= 0.1261
D_{10}= 0.1111 C_u= 1.73 C_c= 1.09

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 9 Comp 7 9 10 13
Sample Number: S2211278-006A

Date Sampled: 11/14/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275

Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 9 Comp 7 9 10 13
Sample Number: S2211278-006A
Material Description: poorly graded sand with silt
Sample Date: 11/14/2022 3:20
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
160.80	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
100.05	0.00	#40	1.07	0.00	98.9
		#60	7.63	0.00	91.3
		#100	63.20	0.00	28.1
		#200	22.87	0.00	5.3

Pace Analytical Services, Inc.

ATTACHMENT A

Hydrometer Test Data

Hydrometer test uses material passing #200

Percent passing #200 based upon complete sample = 5.3

Weight of hydrometer sample =100.05

Table of composite correction values:

Temp., deg. C:	23.0	24.0
Comp. corr.:	-5.3	-4.8

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	18.0	7.0	1.7	0.0140	7.0	15.1	0.0545	0.1
15.00	18.0	7.0	1.7	0.0140	7.0	15.1	0.0141	0.1
30.00	19.0	6.5	1.2	0.0138	6.5	15.2	0.0098	0.1
60.00	19.0	6.0	0.7	0.0138	6.0	15.3	0.0070	0.0
240.00	19.0	5.5	0.2	0.0138	5.5	15.4	0.0035	0.0
1440.00	19.0	5.5	0.2	0.0138	5.5	15.4	0.0014	0.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.1	93.6	94.7	5.3	0.0	5.3

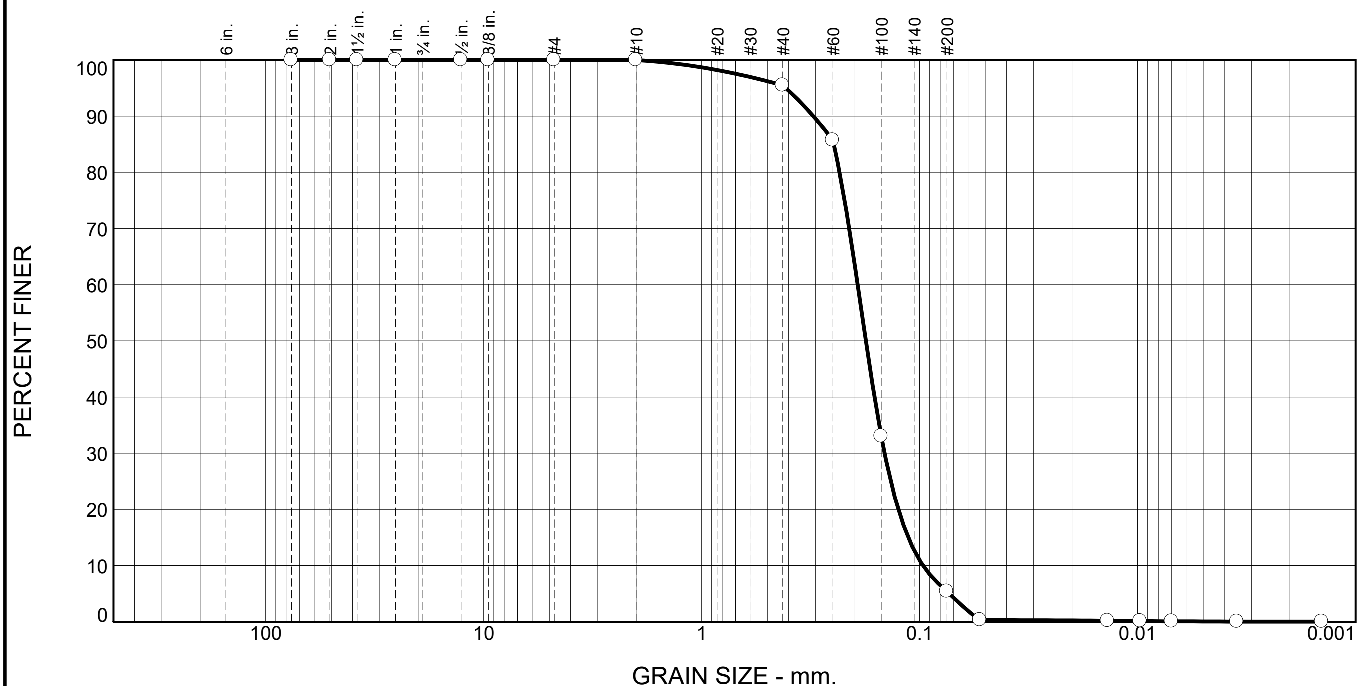
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0733	0.1111	0.1261	0.1366	0.1527	0.1661	0.1791	0.1924	0.2239	0.2340	0.2462	0.3133

Fineness Modulus	C_u	C_c
0.78	1.73	1.09

Pace Analytical Services, Inc.

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	4.5	90.1	5.4	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	95.5		
#60	85.7		
#100	33.0		
#200	5.4		
0.0528 mm.	0.3		
0.0137 mm.	0.2		
0.0097 mm.	0.1		
0.0070 mm.	0.1		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.3073 D_{85}= 0.2476 D_{60}= 0.1925
D_{50}= 0.1765 D_{30}= 0.1449 D_{15}= 0.1129
D_{10}= 0.0966 C_u= 1.99 C_c= 1.13

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 8 Comp 137
Sample Number: S2211278-007A
Date Sampled: 11/15/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275
Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 8 Comp 137
Sample Number: S2211278-007A
Material Description: poorly graded sand with silt
Sample Date: 11/15/2022 9:20
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
74.84	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
51.26	0.00	#40	2.32	0.00	95.5
		#60	5.01	0.00	85.7
		#100	27.00	0.00	33.0
		#200	14.17	0.00	5.4

Hydrometer Test Data

Hydrometer test uses material passing #200

Percent passing #200 based upon complete sample = 5.4

Weight of hydrometer sample =51.26

Table of composite correction values:

Temp., deg. C:	23.0	24.0
Comp. corr.:	-5.3	-4.8

Meniscus correction only = 0.0

Specific gravity of solids = 2.65

Hydrometer type = 152H

Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	8.0	2.7	0.0136	8.0	15.0	0.0528	0.3
15.00	20.0	7.0	1.7	0.0136	7.0	15.1	0.0137	0.2
30.00	20.0	6.5	1.2	0.0136	6.5	15.2	0.0097	0.1
60.00	19.0	6.0	0.7	0.0138	6.0	15.3	0.0070	0.1
240.00	19.0	5.5	0.2	0.0138	5.5	15.4	0.0035	0.0
1440.00	19.0	5.5	0.2	0.0138	5.5	15.4	0.0014	0.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	4.5	90.1	94.6	5.4	0.0	5.4

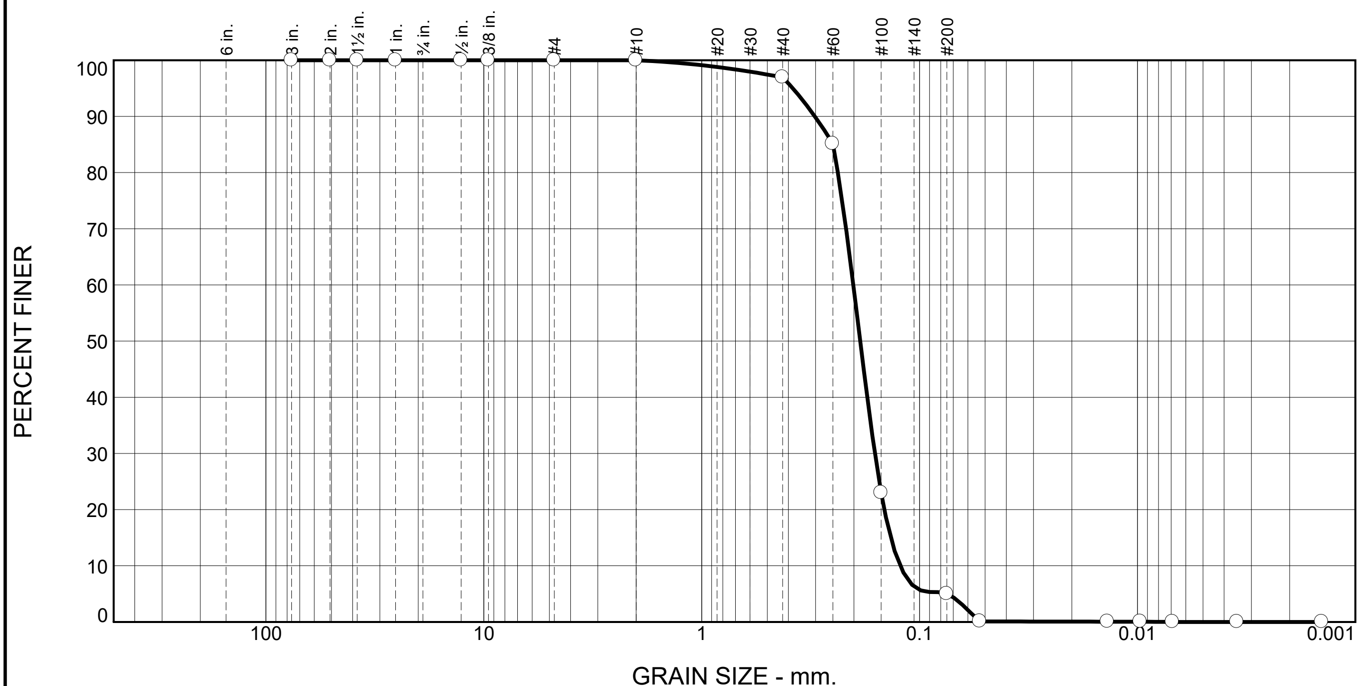
D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0732	0.0966	0.1129	0.1253	0.1449	0.1611	0.1765	0.1925	0.2329	0.2476	0.3073	0.4115

Fineness Modulus	C_u	C_c
0.81	1.99	1.13

Pace Analytical Services, Inc.

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.0	92.0	5.0	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	97.0		
#60	85.1		
#100	23.0		
#200	5.0		
0.0528 mm.	0.1		
0.0137 mm.	0.1		
0.0097 mm.	0.1		
0.0069 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.3023 D_{85}= 0.2496 D_{60}= 0.2015
D_{50}= 0.1872 D_{30}= 0.1603 D_{15}= 0.1355
D_{10}= 0.1228 C_u= 1.64 C_c= 1.04

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: Lake 8 Comp 248
Sample Number: S2211278-008A
Date Sampled: 11/15/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275

Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 8 Comp 248
Sample Number: S2211278-008A
Material Description: poorly graded sand with silt
Sample Date: 11/15/2022 10:15
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
105.06	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
100.05	0.00	#40	3.05	0.00	97.0
		#60	11.82	0.00	85.1
		#100	62.16	0.00	23.0
		#200	18.01	0.00	5.0

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 5.0
Weight of hydrometer sample =100.05
Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	8.0	2.0	0.0136	8.0	15.0	0.0528	0.1
15.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0137	0.1
30.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0097	0.1
60.00	20.0	6.0	0.0	0.0136	6.0	15.3	0.0069	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

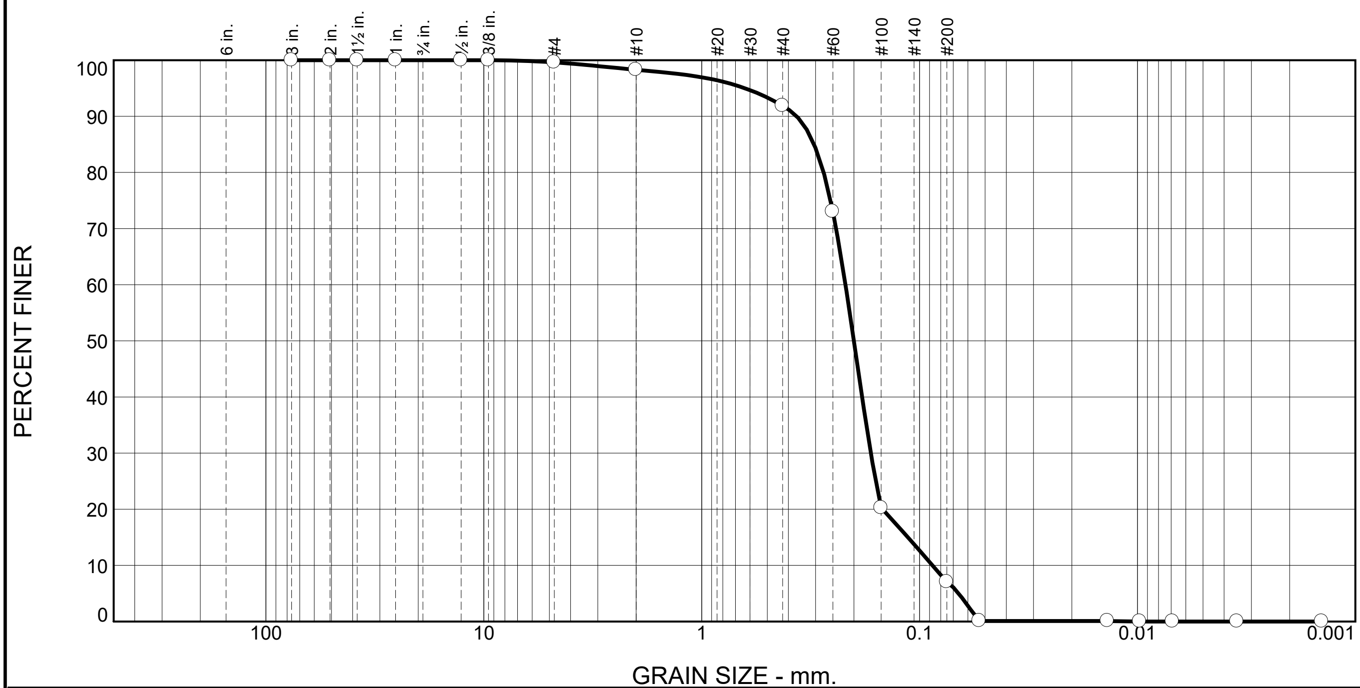
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.0	92.0	95.0	5.0	0.0	5.0

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0749	0.1228	0.1355	0.1450	0.1603	0.1738	0.1872	0.2015	0.2370	0.2496	0.3023	0.3816

Fineness Modulus	C_u	C_c
0.90	1.64	1.04

ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	1.3	6.4	84.9	7.0	0.0

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	99.6		
#10	98.3		
#40	91.9		
#60	73.0		
#100	20.3		
#200	7.0		
0.0531 mm.	0.1		
0.0137 mm.	0.1		
0.0097 mm.	0.0		
0.0069 mm.	0.0		
0.0035 mm.	0.0		
0.0014 mm.	0.0		

* (no specification provided)

Material Description

poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.3662 D_{85}= 0.3048 D_{60}= 0.2188
D_{50}= 0.2003 D_{30}= 0.1673 D_{15}= 0.1132
D_{10}= 0.0872 C_u= 2.51 C_c= 1.47

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: 11/18/2022 **Date Tested:** 11/28/2022
Tested By: Steve Holzerland
Checked By: John Jacobs
Title: Project Manager 2

Location: Lake 8 Comp 659
Sample Number: S2211278-009A
Date Sampled: 11/15/2022

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client: Pace Analytical Ormond Beach
Project: 35760275
Project No: S2211278 **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/29/2022

Client: Pace Analytical Ormond Beach
Project: 35760275
Project Number: S2211278
Location: Lake 8 Comp 659
Sample Number: S2211278-009A
Material Description: poorly graded sand with silt
Sample Date: 11/15/2022 11:45
Date Received: 11/18/2022 **PL:** NP **LL:** NV **PI:** NP
USCS Classification: SP-SM **AASHTO Classification:** A-3
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
92.99	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.36	0.00	99.6
		#10	1.23	0.00	98.3
74.62	0.00	#40	4.87	0.00	91.9
		#60	14.30	0.00	73.0
		#100	40.07	0.00	20.3
		#200	10.04	0.00	7.0

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Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 7.0
Weight of hydrometer sample =74.62
Table of composite correction values:

Temp., deg. C:	21.0	22.0
Comp. corr.:	-6.0	-5.7

Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0531	0.1
15.00	20.0	7.0	1.0	0.0136	7.0	15.1	0.0137	0.1
30.00	20.0	6.0	0.0	0.0136	6.0	15.3	0.0097	0.0
60.00	20.0	6.0	0.0	0.0136	6.0	15.3	0.0069	0.0
240.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0035	0.0
1440.00	19.0	6.0	0.0	0.0138	6.0	15.3	0.0014	0.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.4	0.4	1.3	6.4	84.9	92.6	7.0	0.0	7.0

D_{5}	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0662	0.0872	0.1132	0.1479	0.1673	0.1836	0.2003	0.2188	0.2756	0.3048	0.3662	0.6333

Fineness Modulus	C_{u}	C_{c}
1.05	2.51	1.47

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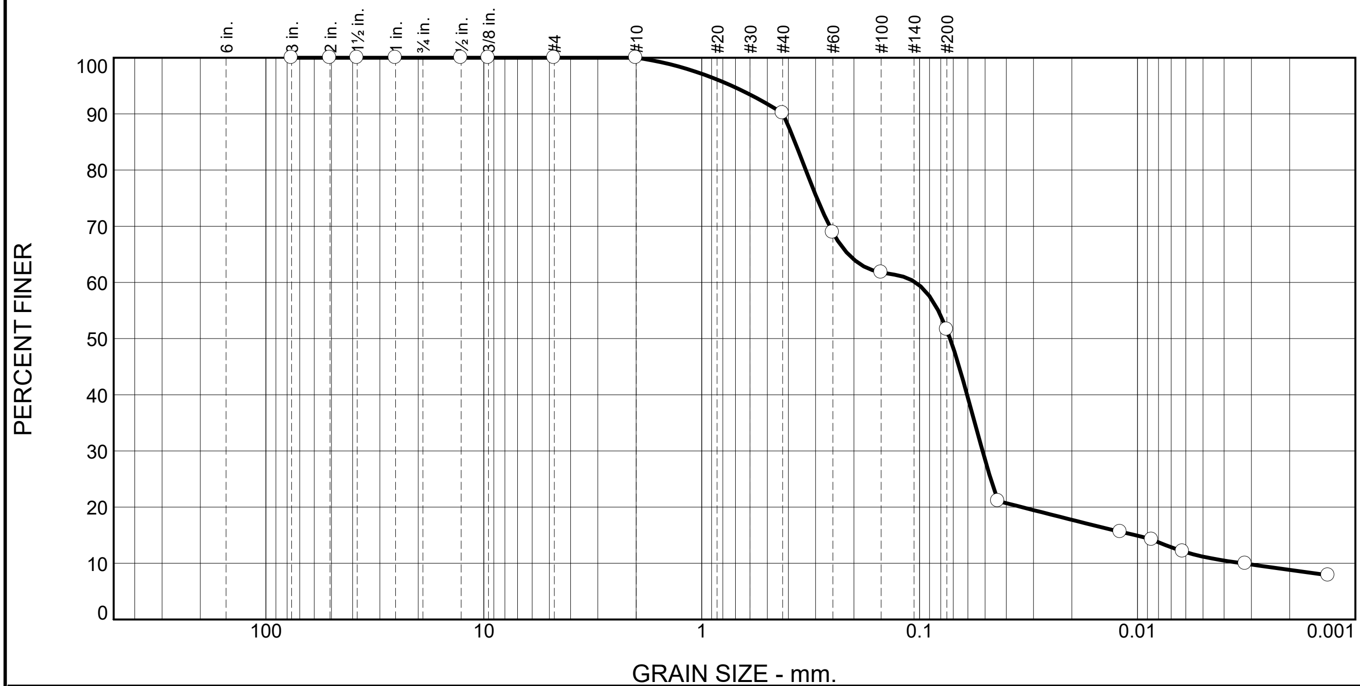
ATTACHMENT A

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	9.9	38.5	40.4	11.2

TEST RESULTS (ASTM D 422)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.5"	100.0		
0.375	100.0		
#4	100.0		
#10	100.0		
#40	90.1		
#60	68.9		
#100	61.8		
#200	51.6		
0.0436 mm.	21.1		
0.0120 mm.	15.6		
0.0086 mm.	14.2		
0.0062 mm.	12.1		
0.0032 mm.	9.9		
0.0013 mm.	7.9		

* (no specification provided)

Material Description

sandy silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=**

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 0.4233 D_{85}= 0.3733 D_{60}= 0.1044
D_{50}= 0.0724 D_{30}= 0.0514 D_{15}= 0.0102
D_{10}= 0.0033 C_u= 31.66 C_c= 7.68

Remarks

SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)

Date Received: **Date Tested:** 11/28/2022

Tested By: Steve Holzerland

Checked By: John Jacobs

Title: Project Manager 2

Location: LCS
Sample Number: LCS
Date Sampled:

Pace Analytical Services, Inc.

Sheridan, Wyoming

Client:
Project:
Project No: **Figure**

ATTACHMENT A

GRAIN SIZE DISTRIBUTION TEST DATA

11/28/2022

Location: LCS
Sample Number: LCS
Material Description: sandy silt
PL: NP **LL:** NV
USCS Classification: ML **AASHTO Classification:** A-4(0)
Grain Size Test Method: ASTM D 422
Testing Remarks: SAND TRUE VALUE: 48.08 (+/-10% 52.88/43.27)
SILT TRUE VALUE: 38.73 (+/-10% 42.6/34.86)
Tested By: Steve Holzerland **Test Date:** 11/28/2022
Checked By: John Jacobs **Title:** Project Manager 2

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
75.00	0.00	3"	0.00	0.00	100.0
		2"	0.00	0.00	100.0
		1.5"	0.00	0.00	100.0
		1"	0.00	0.00	100.0
		0.5"	0.00	0.00	100.0
		0.375	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.00	0.00	100.0
75.00	0.00	#40	7.39	0.00	90.1
		#60	15.94	0.00	68.9
		#100	5.33	0.00	61.8
		#200	7.62	0.00	51.6

Hydrometer Test Data

Hydrometer test uses material passing #200
Percent passing #200 based upon complete sample = 51.6
Weight of hydrometer sample =75.0
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -6.33
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	37.0	30.6	0.0136	37.0	10.2	0.0436	21.1
15.00	20.0	29.0	22.6	0.0136	29.0	11.5	0.0120	15.6
30.00	20.0	27.0	20.6	0.0136	27.0	11.9	0.0086	14.2
60.00	20.0	24.0	17.6	0.0136	24.0	12.4	0.0062	12.1
240.00	19.0	21.0	14.4	0.0138	21.0	12.9	0.0032	9.9
1440.00	19.0	18.0	11.4	0.0138	18.0	13.3	0.0013	7.9

Pace Analytical Services, Inc.

ATTACHMENT A

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	9.9	38.5	48.4	40.4	11.2	51.6

D_5	D_{10}	D_{15}	D_{20}	D_{30}	D_{40}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0033	0.0102	0.0340	0.0514	0.0605	0.0724	0.1044	0.3326	0.3733	0.4233	0.7276

Fineness Modulus	C_u	C_c
0.71	31.66	7.68

ATTACHMENT A

Internal Transfer Chain of Custody

Pace Analytical
www.pacelabs.com

☐ Samples Pre-Logged into eCOC.

State Of Origin: FL
Cert. Needed: ☑ Yes ☐ No

Workorder: 35760275 Workorder Name: City of Naples Lake Restoratio Owner Received Date: 11/16/2022 Results Requested By: 11/22/2022

Report To
Rebecca Lourido

Subcontract To
Pace Analytical Sheridan WY
1673 Terra Avenue
Sheridan, WY 82801
Phone (307)672-8945

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Other	Grain/Sieve,Organic Matter,Moisture	LAB USE ONLY
1	LAKE 9 Comp 134	PS	11/14/2022 09:10	35760275001	Solid	1	X	5221278 –
2	LAKE 9 Comp 256	PS	11/14/2022 10:00	35760275002	Solid	1	X	
3	LAKE 9 Comp 8 11 12 14	PS	11/14/2022 11:00	35760275003	Solid	1	X	
4	LAKE 9 Comp 17 18 20 21	PS	11/14/2022 13:05	35760275004	Solid	1	X	
5	LAKE 9 Comp 15 16 19 22	PS	11/14/2022 14:20	35760275005	Solid	1	X	
6	LAKE 9 Comp 7 9 10 13	PS	11/14/2022 15:20	35760275006	Solid	1	X	
7	LAKE 8 Comp 137	PS	11/15/2022 09:20	35760275007	Solid	1	X	
8	LAKE 8 Comp 248	PS	11/15/2022 10:15	35760275008	Solid	1	X	
9	LAKE 8 Comp 659	PS	11/15/2022 11:45	35760275009	Solid	1	X	

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	65E/PASS	11/17/22 1700	[illegible signature]	11/18/22 10:44	
2					
3					

Cooler Temperature on Receipt 1.5 °C Custody Seal Y or N Received on Ice Y or N Samples Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pace Analytical

1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

ANALYTICAL QC SUMMARY REPORT

CLIENT: Pace Analytical Ormond Beach **Date:** 11/29/2022

Work Order: S2211278 **Report ID:** S2211278001

Project: 35760275

Organic Matter Sample Type **LCS** Units: %

CONTROL (11/29/22 14:39) RunNo: 206022

Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Organic Matter	2.20	0.100	2.53		87.0	80 - 120	

ATTACHMENT A

APPENDIX

C

SEDIMENT FLUX STUDY DOSUMENTATION

ATTACHMENT A

North Lake and South Lake Sediment Flux Analysis

A pair of intact sediment cores were collected from North Lake (Pond 8, P-8) and South Lake (Pond 9, P-9) on September 12, 2022 in clear polycarbonate cylinders (7.3 cm diameter, 30 cm long). Sampling locations were chosen based on the amount of available sediment at locations close to control structures (**Appendix 1**). At the time of sampling, in-situ physicochemical data were recorded using a YSI. Parameters included water temperature, dissolved oxygen (DO), pH, specific conductivity, salinity, and turbidity. Near-bottom ambient lake water was collected at the time of coring and filtered for use during sediment nutrient flux incubations.

Sediment flux analyses were performed in the WSP USA Flux Laboratory in accordance with Standard Operating Procedure (SOP) Wood-SFLUX-002 Rev. 9 (**Appendix 2**). Sediment cores were prepared and incubated in two sets of two cores, representing aerobic and anoxic conditions. To minimize biological activity, cores were kept in the dark, and temperatures were controlled in the range of 23 to 27 degrees C. Water column samples for each core were collected at 0, 24, 48, 96, 168, and 216 hours and analyzed for TP, ammonia, and iron in a NELAC certified analytical laboratory (laboratory reports provided in **Appendix 3**). Turbidity values were monitored throughout incubation to examine the timing of sediment core equilibrium before conducting flux measurements. DO and pH were also monitored during the study to confirm that appropriate redox conditions were being met throughout the incubation period.

Sediment nutrient flux rates were estimated using the nutrient release rate (NRR) equation and the slopes were calculated from the concentration vs. time curve as described in the flux SOP. Typically, the slope method is considered more conservative and more appropriate, especially if the curves are non-linear. Annual internal nutrient loads were estimated at both stations and as spatial averages following the methods described by Ogdahl et al. (2014). Overall average loads were calculated from average flux rates representing the average anoxic and aerobic rates for both stations.

Sediment cores collected at the North Lake (Pond 8) appeared to be composed primarily of brown, tan, and gray sand with trace shell and detrital material, while cores collected at the South Lake (Pond 9) appeared to be composed of a brown, tan, and gray sand mixture with trace detrital material and dark brown sediments. Detailed descriptions and photographs of the sediment cores used during flux analyses can be found in **Appendix 4**. **Table 1** provides the in-situ water quality data measured at the time of sediment core collection. In-situ water quality data measurements for both ponds were taken at 0.3 meters. Overall, measured in-situ data was similar between both ponds. Water temperatures ranged from 28.04 to 29.63 °C, and the observed pH values ranged from 7.17 to 7.32. Dissolved oxygen values suggested that each pond approaches anoxic values at times. Turbidity measurements collected at the time of sampling ranged from 3.34 to 2.35 NTU and salinity ranged from 0.26 to 0.27 ppt.

Table 1 – Ranges of In-Site Sample Profile Water Quality Data at Each Station

Station	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductance (us/cm)	Salinity (ppt)	pH (su)	Turbidity (NTU)
Pond 8	0.3	28.04	1.7	22.1	554	0.27	7.17	3.34
Pond 9	0.3	29.63	2.49	33.2	553	0.26	7.32	2.35

ATTACHMENT A

Figures **1** through **6** display non-linear TP, ammonia, and iron concentration flux curves representing anoxic and aerobic sediment core conditions.TP concentrations in sediment cores P8-1 and P9-1 analyzed under anoxic conditions displayed an initial peak at 48 hours. Core P8-1 concentrations plateaued after their initial increase at hour 48 until hour 168, where they decreased to near zero. In contrast, core P9-1 decreased after hour 48 to the end of the incubation period. Aerobic sediment core P8-A had an initial peak at 24 hours, then stayed relatively constant until decreasing after hour 168. P9-A peaked at the 48-hour mark, followed by a secondary peak at the 168-hour mark.

Figure 1 – Total Phosphorus Concentrations Measured under Anoxic Conditions during Laboratory Incubations of Sediment Cores

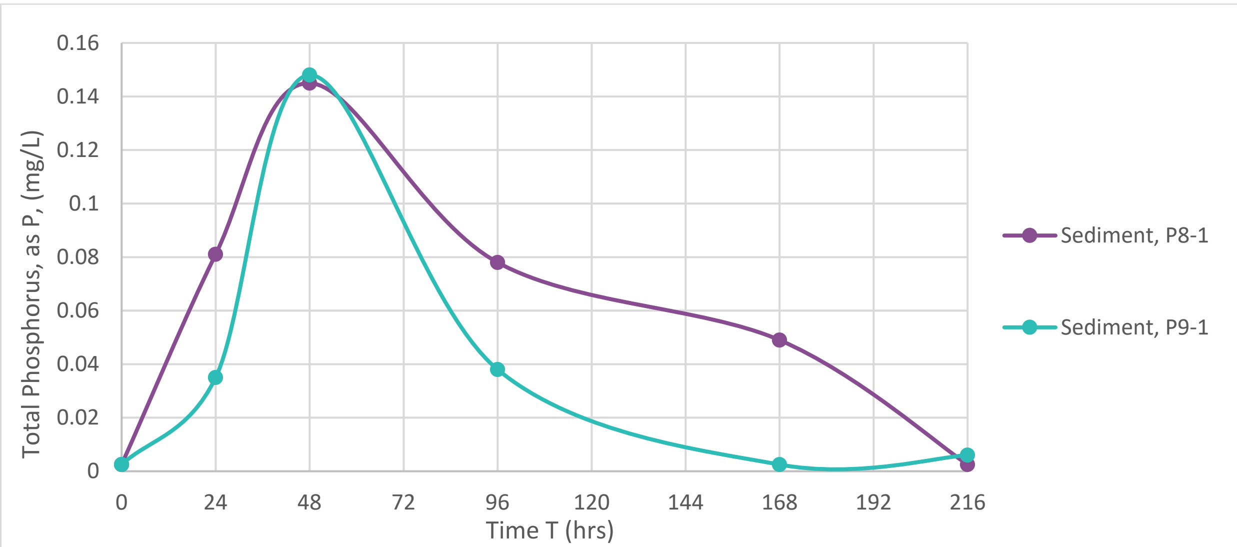
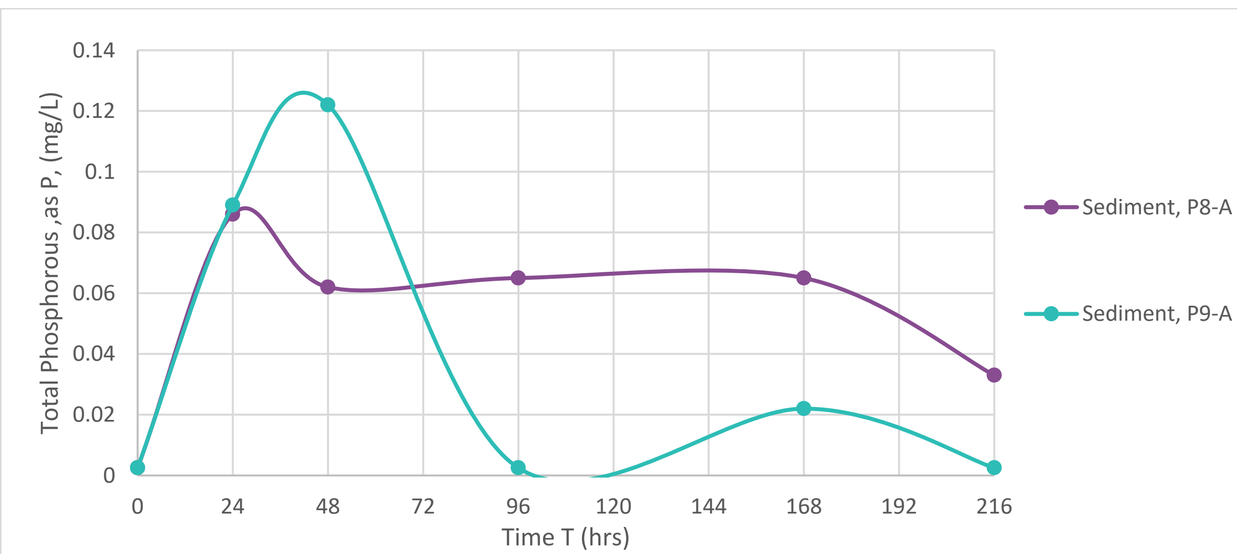


Figure 2 – Total Phosphorus Concentrations Measured under Aerobic Conditions during Laboratory Incubations of Sediment Cores



Ammonia flux from the lake sediments represents the dissolved species of nitrogen that is mineralized from organic nitrogen and then released from the sediment into the water column by diffusion through the sediment-water interface. Ammonia is used as a proxy for total nitrogen since it approximates TN flux. Ammonia concentrations in sediment cores incubated under anoxic conditions displayed initial peaks at the 48-hour mark followed by secondary peaks at the 168-hour mark before remaining constant until the end of the incubation period. Aerobic sediment core P8-A displayed a peak at the 48-hour mark and then remained relatively constant until the end of the incubation period, while core P9-A displayed an initial peak at the 96-hour mark followed by a secondary peak at the 216-hour mark.

Figure 3 – Ammonia Concentrations Measured under Anoxic Conditions during Laboratory Incubations of Sediment Cores

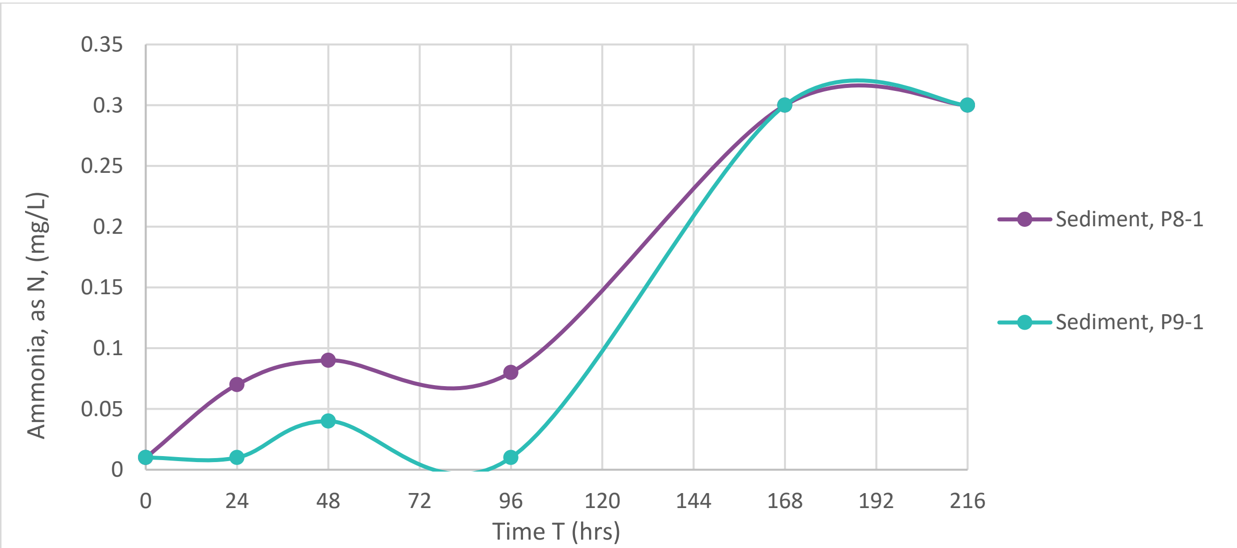
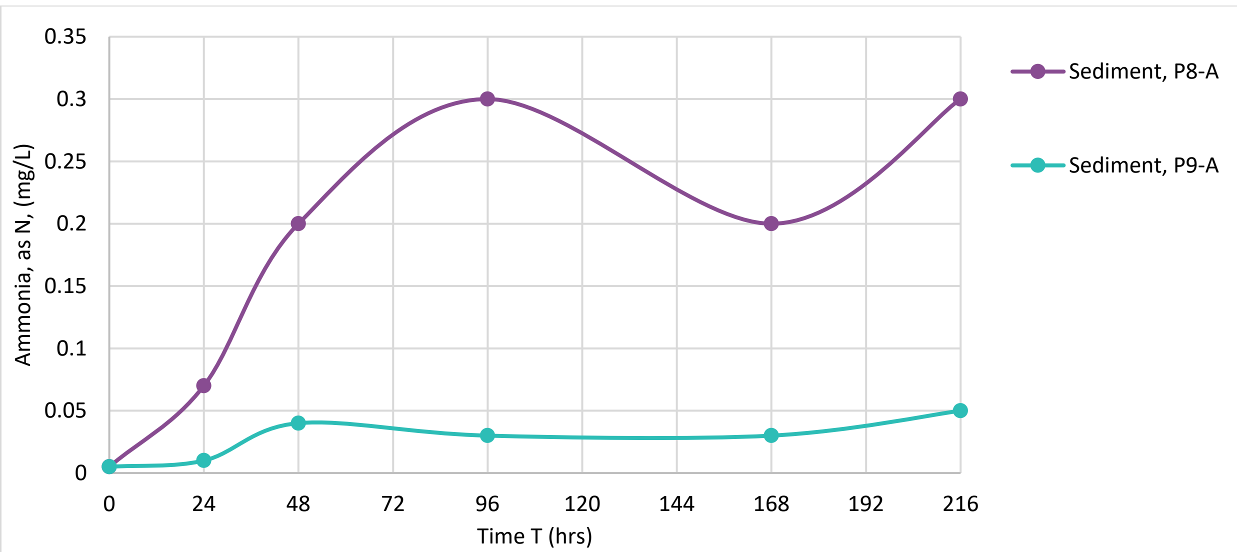


Figure 4 – Ammonia Concentrations Measured under Aerobic Conditions during Laboratory Incubations of Sediment Cores



Iron concentrations in anoxic sediment cores P8-1 and P9-1 displayed initial peaks at the 24-hour mark, then slightly increased to the end of the incubation period. Aerobic sediment core P8-A displays an initial peak at the 24-hour mark then steadily increases until the end of the incubation period. Sediment core P9-A displayed an initial peak at the 48-hour mark, then an additional peak at the 168-hour mark.

Figure 5 – Iron Concentrations Measured under Anoxic Conditions during Laboratory Incubations of Sediment Cores

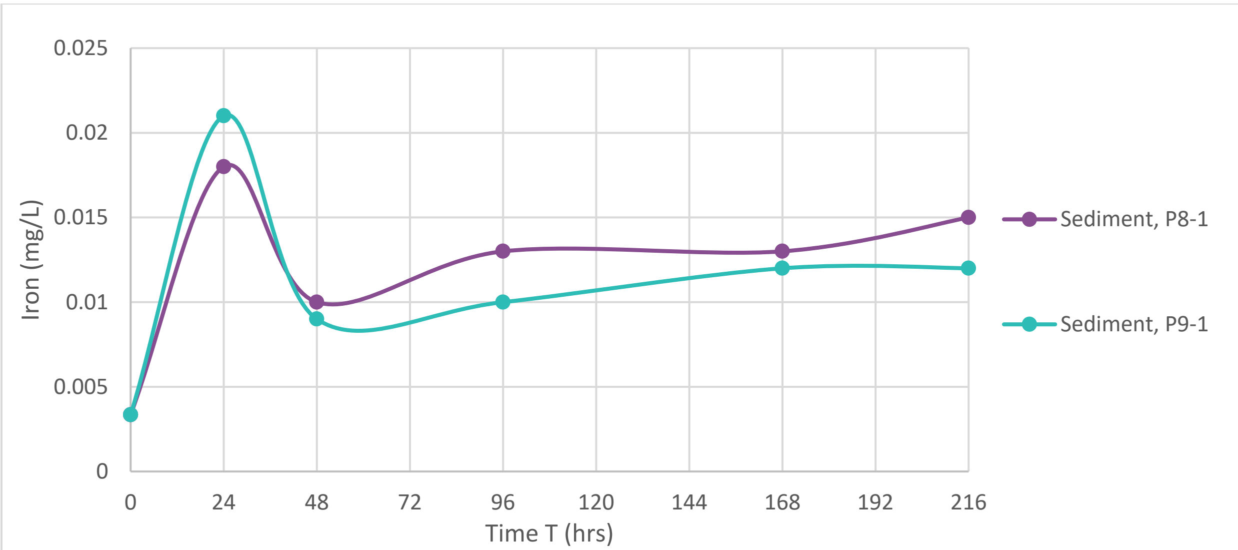
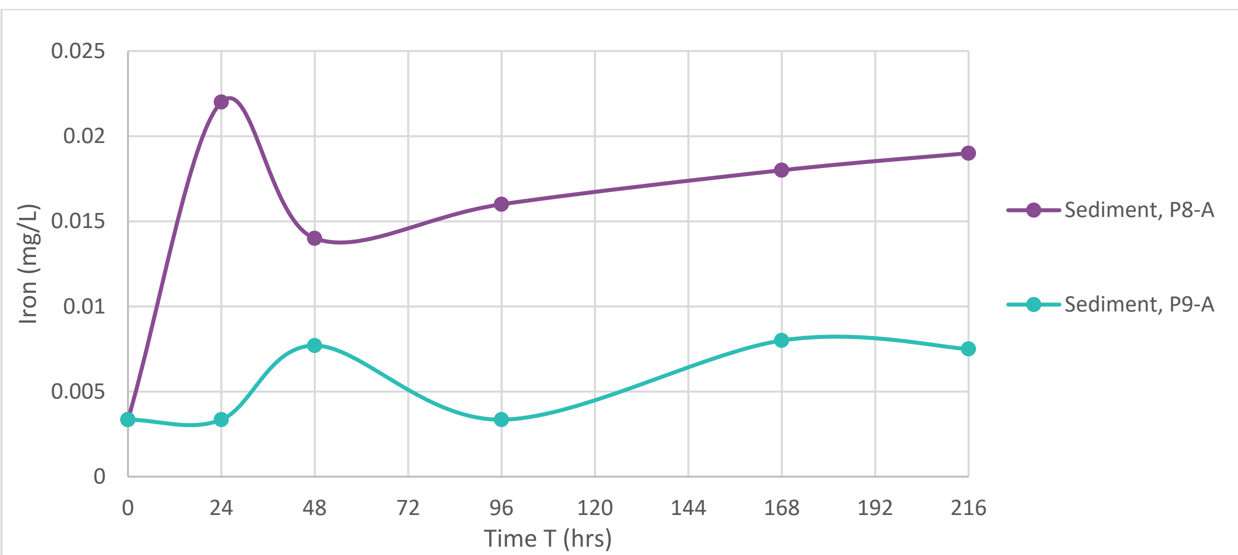


Figure 6 – Iron Concentrations Measured under Anoxic Conditions during Laboratory Incubations of Sediment Cores



Tables **2** and Table **3** provide summaries of anoxic and aerobic gross nutrient flux rates and internal loads for sediment core locations within the two ponds. Average flux rates were calculated for aerobic and anoxic rates and the values were applied to the entire surface area of each pond to estimate representative values for internal loading rates. The internal loads calculated for the Pond 8 sediment core incubated under anoxic conditions were -8.84 lb/yr of TP, 57.66 lb/yr of ammonia, and 1.06 lb/yr of iron using the slope method. Using the NRR equation, internal loads were 0.00 lb/yr TP, 55.29 lb/yr ammonia, and 2.22 lb/yr iron. Under aerobic conditions, the Pond 8 sediment core displayed internal loads of 0.55 lb/yr TP, 45.03 lb/yr ammonia, and 1.56 lb/yr iron using the slope method. Using the NRR equation, the internal loads were 5.81 lb/yr TP, 56.24 lb/yr ammonia, and 2.98 lb/yr iron.

The internal loads calculated for the Pond 9 sediment core incubated under anoxic conditions were -22.60 lb/yr of TP, 159.39 lb/yr of ammonia, and 0.87 lb/yr of iron using the slope method. Using the NRR equation, internal loads were 1.65 lb/yr TP, 136.65 lb/yr ammonia, and 4.08 lb/yr iron. Under aerobic conditions, the Pond 9 sediment core displayed internal loads of -27.16 lb/yr TP, 16.03 lb/yr ammonia, and 1.90 lb/yr iron using the slope method. Using the NRR equation, the internal loads were 0.00 lb/yr TP, 21.20 lb/yr ammonia, and 1.96 lb/yr iron.

Table 2 – Summary of Anoxic and Aerobic Flux Rates and Internal Loads (Slope Equation)

Site	REDOX (Oxygen) Conditions	Flux Parameter	Diffusive Flux Rate (mg/m2/d)	Load (lb/yr)
Sediment, P8-1	Anoxic	Total Phosphorus, as P, (mg/L)	-1.55	-8.84
Sediment, P9-1	Anoxic	Total Phosphorus, as P, (mg/L)	-1.60	-22.60
Average	Anoxic	Total Phosphorus, as P, (mg/L)	-1.57	-15.72
Sediment, P8-1	Anoxic	Ammonia, as N, (mg/L)	10.08	57.66
Sediment, P9-1	Anoxic	Ammonia, as N, (mg/L)	11.28	159.39
Average	Anoxic	Ammonia, as N, (mg/L)	10.68	108.53
Sediment, P8-1	Anoxic	Iron (mg/L)	0.18	1.06
Sediment, P9-1	Anoxic	Iron (mg/L)	0.06	0.87
Average	Anoxic	Iron (mg/L)	0.12	0.96
Sediment, P8-A	Aerobic	Total Phosphorus, as P, (mg/L)	0.10	0.55
Sediment, P9-A	Aerobic	Total Phosphorus, as P, (mg/L)	-1.92	-27.16
Average	Aerobic	Total Phosphorus, as P, (mg/L)	-0.91	-13.30
Sediment, P8-A	Aerobic	Ammonia, as N, (mg/L)	7.87	45.03
Sediment, P9-A	Aerobic	Ammonia, as N, (mg/L)	1.13	16.03
Average	Aerobic	Ammonia, as N, (mg/L)	4.50	30.53
Sediment, P8-A	Anoxic	Iron (mg/L)	0.27	1.56
Sediment, P9-A	Anoxic	Iron (mg/L)	0.13	1.90
Average	Anoxic	Iron (mg/L)	0.20	1.73
Overall Average	Anoxic and Aerobic	Total Phosphorus, as P, (mg/L)	-1.24	-14.51
Overall Average	Anoxic and Aerobic	Ammonia, as N, (mg/L)	7.59	69.53
Overall Average	Anoxic and Aerobic	Iron (mg/L)	0.16	1.35

ATTACHMENT A

Table 3 – Summary of Anoxic and Aerobic Flux Rates and Internal Loads (NRR Equation)

Site	REDOX (Oxygen) Conditions	Flux Parameter	Diffusive Flux Rate (mg/m2/d)	Load (lb/yr)
Sediment, P8-1	Anoxic	Total Phosphorus, as P, (mg/L)	0.00	0.00
Sediment, P9-1	Anoxic	Total Phosphorus, as P, (mg/L)	0.12	1.65
Average	Anoxic	Total Phosphorus, as P, (mg/L)	0.06	0.82
Sediment, P8-1	Anoxic	Ammonia, as N, (mg/L)	9.67	55.29
Sediment, P9-1	Anoxic	Ammonia, as N, (mg/L)	9.67	136.65
Average	Anoxic	Ammonia, as N, (mg/L)	9.67	95.97
Sediment, P8-1	Anoxic	Iron (mg/L)	0.39	2.22
Sediment, P9-1	Anoxic	Iron (mg/L)	0.29	4.08
Average	Anoxic	Iron (mg/L)	0.34	3.15
Sediment, P8-A	Aerobic	Total Phosphorus, as P, (mg/L)	1.02	5.81
Sediment, P9-A	Aerobic	Total Phosphorus, as P, (mg/L)	0.00	0.00
Average	Aerobic	Total Phosphorus, as P, (mg/L)	0.51	2.91
Sediment, P8-A	Aerobic	Ammonia, as N, (mg/L)	9.83	56.24
Sediment, P9-A	Aerobic	Ammonia, as N, (mg/L)	1.50	21.20
Average	Aerobic	Ammonia, as N, (mg/L)	5.67	38.72
Sediment, P8-A	Aerobic	Iron (mg/L)	0.52	2.98
Sediment, P9-A	Aerobic	Iron (mg/L)	0.14	1.96
Average	Aerobic	Iron (mg/L)	0.33	2.47
Overall Average	Anoxic and Aerobic	Total Phosphorus, as P, (mg/L)	0.28	1.87
Overall Average	Anoxic and Aerobic	Ammonia, as N, (mg/L)	7.67	67.34
Overall Average	Anoxic and Aerobic	Iron (mg/L)	0.33	2.81

Sediment flux analysis showed similar total phosphorus, ammonia, and iron concentration values between North Lake (Pond 8) and South Lake (Pond 9). Flux rates and loads calculated using the Slope equation were on average lower and more conservative as compared to the values calculated by the NRR equation. However, both sets of equations suggest that each lake has the potential to act as a source of nitrogen while acting as a sink for phosphorus. Therefore, it is recommended that measures are taken to conduct targeted dredging and/or treatment of the sediment via chemical inactivation to reduce internal nutrient cycling and loads to each lake.

ATTACHMENT A

APPENDIX 1 – FLUX SAMPLING LOCATIONS

ATTACHMENT A

Legend

Sampling Location

N W E S

0 200 400 800 Feet

Flux Sampling Points
Naples North and South
Lake Restoration

wsp

Created by: MR
Checked by: FL

ATTACHMENT A

APPENDIX 2 – FLUX SAMPLING STANDARD OPERATING PROCEDURE

ATTACHMENT A

STANDARD OPERATING PROCEDURE
EVALUATION OF TREATMENT ALTERNATIVE EFFICIENCIES THROUGH DIRECT MEASUREMENT OF DIFFUSIVE FLUX

Effective Date: June 11, 2018

Prepared by: Water Resources Technical Lead Scientist; Laboratory Scientist

Approved by: Quality Assurance Field Officer; Quality Assurance Laboratory Director

TABLE OF CONTENTS

1.0 Purpose

This SOP describes field and laboratory methods recommended to evaluate the potential internal nutrient loading from sediments that may occur in a waterbody, as part of the sediment nutrient flux assessment component of the subject Project. In addition, various treatment alternatives can also be evaluated by measuring the reduction of diffusive nutrient flux, which would directly relate to the alternative's treatment efficiency.

The flux study will aid in quantifying the potential beneficial impacts of adding a biological or chemical amendment or cap to improve water quality.

2.0 Scope, Application and Applicable Matrix

Sediment nutrient accumulations in waterbodies over time can contribute pollutant sources to the overlying water column, through biogeochemical processes such as adsorption, desorption and diffusion processes (Lijklema et al. 1993). Detailed physical and chemical characterizations of sediments are therefore essential to evaluate the nutrient exchange processes that occur at the sediment-water interface (Sahin et al. 2012).

Phosphorus is typically the limiting nutrient in lentic systems, and when found in excess, eutrophication can occur (Dorich et al. 1985). As a growing number of waterbodies worldwide suffer from cultural eutrophication, determination of the causes of water quality degradation is becoming increasingly important for water resource management and restoration (Ogdahl et al. 2014). Bottom sediments in waterbodies play a major role in releasing nutrients to the overlying water column during wind induced sediment resuspension and/or by constant flux due to diffusion (Reddy et al. 1996). Projects that include treatment alternatives to cap sediments containing high concentrations of biologically available nutrients are beneficial to the recovery of water quality and ecological conditions in waterbodies such as lakes and streams.

Nutrient bioavailability and reactivity in the sediments can be quantified by measuring different forms of nitrogen (N) and phosphorus (P) content in the sediment (Olila et al. 1995) and release from the sediments into the water column (Ogdahl et al. 2014). The amounts and forms of reactive and nonreactive P in sediments can be examined using chemical extraction procedures to differentiate between the P fraction's solubility when exposed to various chemical extractants (Psenner et al. 1988; Olila et al. 1995). Readily available P (i.e. labile P) is defined as the sum of water-soluble P and NH_4Cl or KCl extractable P. These labile P fractions are desorbed and hydrolyzed or loosely bound or adsorbed (Hieltjes and Lijklema 1980; Topcu and Pulatsu 2008). The NaOH-extractable P fraction is the reductant soluble P form that can be released under certain environmental conditions and is extracted from iron hydroxide and aluminum hydroxide surfaces in the laboratory (Hieltjes and Lijklema 1980; Topcu and Pulatsu 2008). The sum of labile P and reductant soluble P forms typically account for the total biologically available P (BAP), which can be used as fuel to promote growth by phytoplankton in the water column (Reddy et al. 1998). Nutrient loading rates that diffuse from the sediments are dependent on the geologic nature (i.e. high natural phosphorus content) and/or legacy point source inputs into the system.

Flux rates of biologically available nutrients from the sediments can be quantified in the laboratory by incubating intact sediment cores under controlled laboratory conditions and measuring changes in nutrient concentrations over time in the water column overlying the sediment cores (e.g., Schelske et al. 1991, Trefry et al. 1992, Moore et al. 1998, and Ogdahl et al. 2014,). The primary benefit of the laboratory incubation approach is that the experimental conditions and the range of factors affecting flux rates can be carefully controlled. A slight drawback is the possibility that laboratory studies cannot completely mimic *in-situ* waterbody conditions and are subject to laboratory artifacts if sufficient controls are not put in place.

Intact sediment core incubations to determine flux rates rely on careful sediment extraction in the field and minimum disturbance during laboratory incubations. At the lab, nutrient concentration changes in the overlying water are evaluated overtime. Flux rates could be highly variable, dependending on the conditions that were encountered before and during inclubation. Some important considerations include the following:

1) Depth of sediment profiles collected and analyzed in the core
2) Depth of water analyzed on top of the sediment in the core
3) Initiation of incubation after inclusion of source water
4) The number and distribution (on time scale) of data points to develop the flux rate
5) The beginning and end points, and the length of incubation and time spanning between data points and from beginning to end of the run
6) Whether the tests are conducted in aerobic, anoxic, quiescent and/or turbulent conditions.

Depending on the study objective, it is possible to conduct the flux tests in both aerobic and anoxic conditions in separate core profiles (with replicates) to limit error introduced from biogeochemical processes not regularly encountered in the waterbody. Therefore, maintenance of low oxygen concentrations at anoxic levels by gentle purging with N_2 gas mixture is necessary to maintain the appropriate anoxic conditions. In contrast, gentle purging of air gas mixture is needed to mainain aerobic conditions. In addition, an appropriate stirring rate may be desired to establish a representative diffusive boundary layer thickness similar to the level of turbulance of the subject waterbody.

The intact sediment core laboratory incubation approach was selected to take advantage of strictly controlled laboratory conditions that can be manipulated to answer specific resource management questions.

Details of the experimental design and methodology are provided below, which are applicable to sediment samples collected by Wood field technicians, processed and/or analyzed by the Wood Laboratory and/or other certified laboratories. Trained field technicians and laboratory technical staff with applicable training and experience are responsible for performance of this SOP.

3.0 Materials and Methods

3.1 Field Sample Collection Procedures, Preservation and Storage

Three different types of samples and analyses should be conducted at each sampling site. The three types are identified by letters **a** through **c** below and should be collected in the following order for quality control purposes:

a) Water Chemistry *In-situ* Vertical Profile
b) Sediment Depth (*In-situ*)
c) Intact Sediment Cores

Intact sediment cores should be transported to the Wood Flux Laboratory for set-up and immediately after core extrusion. Sampling methods and laboratory procedures for each of the different sampling types are described in the following sub-sections.

3.1.1 Field Equipment and Supplies

1) Safety plan
2) Boat with motor
3) GPS
4) Camera
5) Maps with access, site locations, and contact information
6) FDEP SOPs for water sampling
7) Field sheets
8) Fine point sharpies
9) Labels
10) Putty knife and screwdriver
11) Metric ruler
12) YSI MDS 550 multiparameter water quality sonde (calibrated and checked (ICV, CCV) documented on calibration logs per FDEP SOP)
13) Turbidimeter (calibrated and checked (ICV, CCV) documented on calibration logs per FDEP SOP)
14) Secchi disk
15) Levelling rod for muck depth and hard bottom depth
16) Peristaltic pump or submersible pump for collection of near-bottom ambient water for carboys/jugs for use in incubations
17) 12 X 3” outer diameter (OD) clean clear polycarbonate core tube, with 2 $^{7}/_{8}$” inner diameter (ID) and a $^{1}/_{16}$” wall thickness, cut into 2’ long pieces
18) Piston corer assembly for intact flux cores
19) Minimum of 16 3” test plugs to serve as bottom and top core plugs
20) Duct tape, epoxy glue, or other material to prevent leakage from cores
21) Extra-large black garbage bags to cover and keep core samples in the dark
22) Coolers with upright frame for flux core storage and transport

3.1.2 Field Equipment Calibration

Staff generated documentation of initial calibration, initial calibration verification and continuing calibration verification of water quality multiparameter sondes used to collect *in-situ* water chemistry profiles, and other field data collection equipment, as applicable. The FDEP SOPs (FS1000, FT1000, FD1000, FT1100, FT1200, FT1300, FT1400, FT1500, and FT1600), should be used for pre and postevent instrument calibration and/or verification conducted prior to commencing sampling and at the end of each sampling day.

3.1.3 Field Sample Collection and QA/QC Procedures

Several SOPs such as the FDEP SOPs for water and sediment sampling (FS1000, FS2000, FS2100, and FS4000) should be kept on-hand during mobilization or pre-event preparation, and sampling. These SOPs should be followed to maintain a high level of accuracy in data collection and to ensure sound QA/QC management practices should be being followed.

3.1.3.1 Sample Type A: *In-situ* Vertical Profile of Water Chemistry

1) At each site, photographs should be taken showing the water column and habitat conditions of the site. In addition, photos should be taken of each of the sediment cores collected. The photographs taken should be noted on the field sheets.
2) Any notable field conditions should be noted such as weather or other environmental conditions that may affect sampling results.
3) At each site, *in-situ* water chemistry vertical depth profiles should be collected with a properly calibrated YSI multiparameter sonde.
4) The length of the YSI cord should be long enough to reach the bottom of the water column
5) At each site, YSI measurements should be recorded at three depths in the water column at the top, middle, and as near to the bottom as possible without disturbing the sediments (within 0.5 m of benthic surface).
6) Care must be taken to not disturb the sediments to cause error in the measurements.
7) The following parameters should be recorded for the overall site: total water depth, Secchi depth and measurement depth.
8) The following parameters should be recorded at each incremental depth: water temperature, dissolved oxygen (DO), pH, specific conductivity, salinity, ORP, and turbidity.

3.1.3.2 Sample Type B: Sediment Depth Collection

1) At each site, the top and bottom depth of flocculent sediment layer (muck), and the depth to hard bottom (refusal) should be measured with a levelling rod.
2) Sediment muck depths should be recorded on corresponding field sheets.

3.1.3.3 Sample Type C: Sediment Intact Cores Collection

1) At three predetermined sites, intact undisturbed sediment cores should be collected with a coring assembly (3' clear polycarbonate tube coupled with drive rods) to a depth of 20 cm from the top of sediment (0-20 cm).
    a. At all three predetermined sites 2 cores will be collected at each location (one for anoxic and one for aerobic incubation).
    b. Two water controls (one aerobic, and one anoxic) will be incubated along with the intact cores.

2) All core tubes must be labeled properly with site name, date, time, sampler names, and replicate number (1-8) on a piece of removable tape.
3) Care should be taken to ensure that homogenous replicate samples are collected from each site, which will require inspection of the replicates prior to placing the samples into the upright core racks (for storage and transportation). If the stratigraphy of the core samples differ, then a different, more homogeneous sediment strata should be located.
4) 25 to 40 cm of near-bottom ambient water should be included on top of the sediment core
5) After sediment is captured by the coring device, the core will be brought to the water's surface, sealed with a rubber stopper prior to breaking the water surface. Core retrieval approach may vary depending on the type of substrate. Slippage of sediments out of the bottom of the core must be stopped to avoid sample loss out of the bottom of the core and to avoid disturbing the sediments within the core.

6) The intact cores should be sealed with the appropriate top and bottom rubber stoppers.
7) The intact cores rubber stoppers will be wrapped with duct tape or an epoxy will be applied to the stopper to prevent leakage (epoxy is primarily needed for sandy samples with low organic matter content to prevent sample falling out the bottom of the core).
8) All cores must be,
    a. covered with a dark garbage bag to limit light affecting the cores, and
    b. transported in an upright position (using a rack) to the Wood Flux Lab for incubation and nutrient flux experiments
9) All COC paperwork must be filled out completely, and provided to the Wood lab
10) A copy of the COC signed by the laboratory must be received prior to departure

3.2 **Sample Type C: Internal Laboratory Sample Preparation Procedure, Preservation and Storage for Intact Sediment Core Incubation Flux Measurement**

3.2.1 Laboratory Equipment and Supplies

For set-up

1) Teflon tubing
2) Acid washed carboys
3) Deionized water (DI)
4) Labeling tape
5) 0.45 micron filtered ambient water

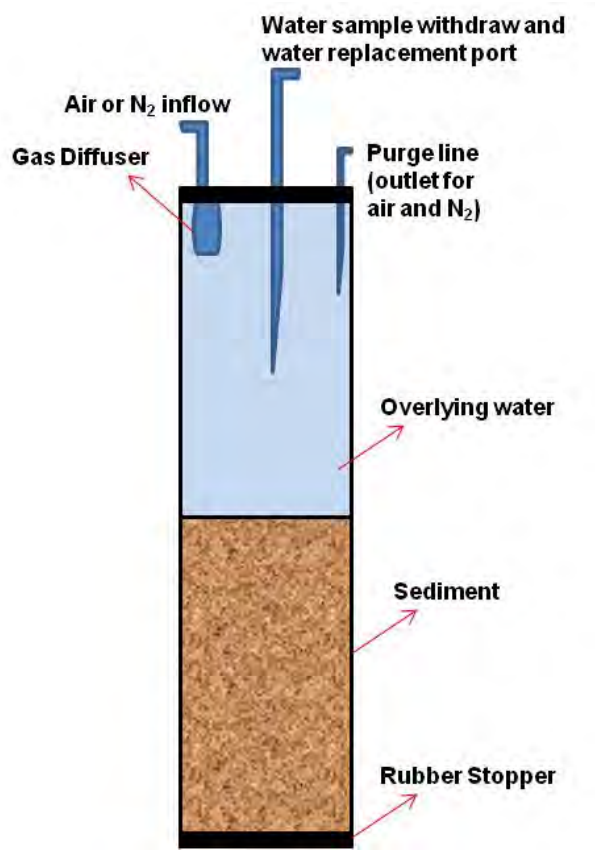
For nutrient flux experiment

1) Thermostat
2) Verification thermometer (ambient temperature)
3) pH meter
4) Oxygen meter with incorporated thermometer
5) Turbidity meter
6) Sterile polyethylene syringes
7) 0.45 µm membrane filters
8) Clean sample collection bottles (provided by analytical lab)
9) Diffuser
10) Teflon tubing
11) Labeling tape

3.2.2 Reagents and Standards

1) Nitrogen Gas

Figure 1. Intact Core Incubation Apparatus



3.2.3 Laboratory Procedure: Intact Sediment Core Preparation and Incubation

Near Bottom Ambient Water Preparation:

1) Prior to initialization of core incubation, the ambient water should be filtered using an in-line 0.45-micron capsule filter with a peristaltic pump. Once filtered, half of the containers should be bubbled with N_2 gas at a rapid rate to achieve and maintain anoxic conditions prior and during flux sampling. The other half will be stored until needed for water replacements on the intact cores. At that time, water containers will be bubbled with N_2 gas at room temperature until anoxic conditions are achieved and then used to refill intact cores.
2) The setup of the intact core apparatus is shown in **Figure 1**, and it includes fittings and tubing required for subsampling.

Adjustment of Sediment on Cores:

3) If cores are received with sediment depths that are not the desired amount (20 cm), then cores may be adjusted to the desired depth of sediment and overlying water column (~30 cm) prior to incubation.
4) To adjust sediment volumes on the cores, first remove overlaying water by siphoning with a Teflon tube, making sure not to disturb or remove the top layer of sediment, then remove the bottom stopper and carefully let the sediment out of the bottom of the core tube. Make sure to seal the bottom of the core well to prevent water leakage during flux study. Refill with filtered ambient water as described in step 5 below.

Replacing Overlying Water with Filtered Ambient Water:

5) If the sediments on the core do not require adjustment, remove the overlaying water and replace with ~30 cm of filtered near bottom ambient water from the carboy. The water should reach to the

top of the core. The water must be added slowly to prevent disturbance of sediments. After the water is replaced on the core, it is time to begin the stabilization/equilibration period.

Sediment Core Equilibration:

6) The time necessary for sedimentation/equilibration to be achieved is dependent on the composition of the sediment in upper portion of the core. Flocculent sediment material will require a longer duration for complete settling (up to 24 hours), whereby, sandy sediment may be equilibrated within the 12 hour timeframe). Systematic monitoring of turbidity can inform the length of time needed to achieve full equilibration and sedimentation in the core. It is recommended to allow enough time for the equilibration period to achieve ca. 85-90% reduction of measured turbidity values (via settling) prior to commencing flux sampling.
7) Nutrient release dynamics can be variable at the start of the intact sediment cores incubation, and are influenced by the cores equilibration time (Ogdahl et al. 2014). Therefore, the cores should be allowed to stabilize/equilibrate for a minimum of 24 hours, to allow for complete sedimentation processes to occur (Ogdahl et al. 2014) prior to commencement of the flux measurements.

Sediment Core Incubation and Sampling:

8) Cores from each site should be incubated in the dark using a temperature range between 23 to 27^0C (with a target incubation temperature of 25^0C), which should be consistent with ambient water conditions at the collection site with a tolerance range of $\pm 4^0$C during median temperature ranges.
9) The cores should be exposed and incubated under anoxic and aerobic conditions with replicates.
10) For the anoxic redox treatment, it is imperative to prevent oxygen exposure to the water column at all times while preparing for and during flux incubation and sampling. The water column should be bubbled with N_2 gas at a consistent rate that does not disturb and resuspend the upper layer of sediment in the core. However, the bubbling rate must be rapid enough to achieve and maintain anoxic conditions in the water column and sediment prior to commencing flux sampling.
11) Dissolved oxygen (DO) should be systematically monitored (e.g. every 6-8 hours) to ensure that the appropriate redox treatment is being achieved and maintained at the beginning and throughout the incubation. A DO concentration of less than 1 mg/L is required to maintain anoxic conditions.
12) The cores should be incubated for a period of no less than 5 days (120 hours), and up to 10 days (240 hours) with at least three discrete sampling time intervals between time= 0 hr, and time= 240 (if 10 days is selected as the length of incubation). Typically, sampling intervals should occur at T= at 48 hr, 168 hr, and 240 hours. However, depending on the day that the samples are collected, and the analytical lab's operating schedule, these intervals may be adjusted as needed. On many occasions, at four to five sampling intervals will be collected for better data resolution and to fit the curve.
13) A water sample should be periodically removed for sample analysis with a polyethylene syringe fitted with a length of 1-mm polyethylene tubing positioned to withdraw samples at mid-lower water column from each core as part of the sampling interval collections. Critical parameters for flux sampling include iron, total phosphorus and ammonia (NH_3) to meet project objectives, which should only require 50 ml per parameter, for a total of 150 ml of water removed from each core for a sample. However, additional parameters could also be sampled. The number of parameters sampled is based on the study design and goals, but it must be understood that with each parameter sampled, additional water volume must be replaced on the core, which can potentially introduce dilution error into later sampling interval samples. It is recommended to sample as few parameters as possible to avoid introducing dilution error into the results.
    a. For the NH3 sample, sulfuric acid must be added to properly preserve the sample.
14) The depth of water on top of the core should be maintained throughout the incubation at ~30 cm. The volume of water (150 ml) that is removed if all three parameters are collected during each subsampling interval shall be replaced with an equal volume of ambient water (under the appropriate redox condition). Based on a 7.3 cm diameter core, and a depth of 30 cm, the volume of water on top of each sediment core will be maintained at approximately 1260 ml. The ~150 ml

that would be removed if all three parameters are collected during each subsampling event represents less than 5% of the total volume of water on top of the sediment in the core, which should not have an effect on dilution of the remaining volume. The replacement amount shall not exceed more than 5% during each sampling interval to minimize the effect of replacement water on the remaining core water nutrient concentrations.

15) Discrete interval subsamples will be placed into sample containers and transported to the analytical laboratory in coolers on ice for analysis.

4.0 Data Analyses

4.1 Calculation of Nutrient Flux Rates

Nutrient flux rates should be estimated using the nutrient release rate equation, which was calculated based on the change of nutrient concentration over time (see equation below) and also by calculating the slope by using the interval sampling data and time step. Annual internal load of nutrients should be estimated following the methods described by Ogdahl et al. (2014) by using the nutrient release rate calculation and by calculating the rate with the slope.

Nutrient Release Rate Calculation - The flux rates for nitrogen and phosphorus species can be calculated using the following equation:

Eq. 1 $Nrr = [(Ct - Ci) \times V / A] / \text{delta } t$

Where:

Nrr = the gross nutrient release (positive values) or retention (negative values) rate per unit surface area of sediment (mg /m^2/ d),

Ct = the final nutrient concentration at time t, or near the end of the incubation,

Ci = the initial nutrient concentration at time i, near the beginning of the incubation,

V = the volume of water in the water column,

A = the surface area of the sediment core, and

delta t = change in time, from time t-i.

5.0 Quality Control

1) All equipment was calibrated before use in the field and laboratory per FDEP SOPs noted in previous sections. Continuing verification of calibration was performed at the end of the day. SOPs should be used as a reference during field and laboratory activities to maintain quality control.

6.0 Safety and Waste Management

1) Laboratory staff must use proper safety equipment (e.g., eye protection, gloves, close-toe shoes)
2) Staff will perform necessary leak checks on gas cylinders.
3) Gas cylinders will be secured at all times and capped when not in use.
4) Sediments in core will be disposed as a solid waste.

7.0 **References**

Dorich, R. A., D. W. Nelson, and L. E. Sommers. 1985. Estimating Algal Available Phosphorus in Suspended Sediments by Chemical Extraction. J. Environ. Qual. 14: 400-405.

Hieltjes, A. H. M. and L. Lijklema. 1980. Fractionation of Inorganic Phosphates in Calcareous Sediments. J. Environ. Qual. 9:405-407.

Lijklema, L., A. A. Koelmans and R. Portielje. 1993. Water Quality Impacts of Sediment Pollution and the Role of Early Diagenisis. Wat. Sci. Tech. 28:1-12.

Montgomery, J. R., C. Zimmerman, and M. Price. 1979. The collection, analysis, and variation of nutrients in estuarine porewater. Estuarine and Coastal Marine Science. 9: 203-214.

Moore, P. A. Jr. K. R. Reddy, and M. M. Fisher. 1998. Phosphorus Flux between Sediment and Overlying Water in Lake Okeechobee, Florida: Spatial and Temporal Variations. J. Environ. Qual. 27:1428-1439

Ogdahl, M.E., Steinman, A.D., and M.E. Weinert. 2014. Laboratory-determined Phosphorus Flux from Lake Sediments as a Measure of Internal Phosphorus Loading. J. Vis. Exp. 85, e51617, doi:10.3791/51617.

Olila, O. G., K. R. Reddy, W. G. Harris, Jr. 1995. Forms and Distribution of Inorganic Phosphorus in Sediments of Two Shallow Eutrophic Lakes in Florida. Hydrobiologia. 302: 147-161.

Paulic, M., Steward, J., Busby. T., and M. Policastro. 2012. Indian River Lagoon Basin Management Action Plans (BMAPs): Muck Removal Project Credit Guidance. FDEP, Water Quality Restoration Program.

Psenner, R., Boström, B., Dinka, M., Petterson, K., Pucsko, R., Sager, M., 1988. Fractionation of phosphorus in suspended matter and sediment. Archive für Hydrobiologie: Ergebnisse der Limnologie 30, 98e103.

Reddy, K. R., M. M. Fisher, and D. Ivanhoff. 1996. Resuspension and Diffusive Flux of Nitrogen and Phosphorus in a Hypereutrophic Lake. J. Environ Qual. 25: 363-371

Reddy et al. 1998. Forms of soil phosphorus in selected hydrologic units of the Florida Everglades. Soil Sci. Soc. Am. J. 62:1134-1147.

Reddy, K. R., M. Fisher, H. Pant, P. Inglett, and J. White. 2001. Indian River Lagoon Hydrodynamics and Water Quality Model: Nutrient Storage and Transformations in Sediments. Final Report to St. Johns River Water Management District, Palatka, FL.

Sahin, Y., A. Demirak, and F. Keskin. 2012. Phosphorus Fractions and its Potential Release in the Sediments of Koycegiz Lake, Turkey. Lakes, Reservoirs and Ponds. 6: 139-153

Schelske, C.L., M. Brenner, and T.J. Whitmore. 1991. Lake Seminole Sediment Characterization and Analysis. Final report prepared for the Southwest Florida Water Management District. University of Florida Department of Fisheries and Aquaculture. Gainesville, Fl.

Southwest Florida Water Management District. 1992. Lake Seminole Diagnostic Feasibility Study. Final report prepared for the Pinellas-Anclote River Basin Board. Brooksville, Fl.

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Topcu, A., and S. Pulatsu. 2008. Phosphorus Fractions in Sediment Profiles of the Eutrophic Lake Mogan, Turkey. Fresenius Environmental Bulletin 17: 164-172.

Trefry, J. H., H. Feng, R. Trocine, S. Metz, G. Grguric, R. Vereecke, and S. Cleveland. 1992. Concentrations and Benthic Fluxes of Nutrients from Sediments in the Indian River Lagoon, Florida (Project MUCK, Phase II). Final Report to the St. Johns River Water Management District, Palatka, FL.

APPENDIX 3 – LABORATORY REPORTS

ATTACHMENT A

Advanced Environmental Laboratories, Inc
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Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
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Fax: (813) 630-4327

FINAL

Workorder: City of Naples (T2218971)

October 04, 2022

Francesca Lauterman
Wood EIS
1101 Channelside
Suite 200
Tampa, FL 33602

RE: Workorder: T2218971 City of Naples

Dear Francesca Lauterman:

Enclosed are the analytical results for sample(s) received by the laboratory on Monday September 19, 2022. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Bell, Sr Project Manager
SBell@aellab.com

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Sample Summary

Lab ID	Sample ID	Matrix	Method	Date Collected	Date Received	Analytes Reported	Basis
T2218971001	DI-T=0	WA	EPA 200.7	09/14/2022 16:00	09/19/2022 14:00	1	NA
T2218971001	DI-T=0	WA	EPA 350.1	09/14/2022 16:00	09/19/2022 14:00	1	NA
T2218971001	DI-T=0	WA	EPA 365.3	09/14/2022 16:00	09/19/2022 14:00	1	NA
T2218971002	DI-Dup-T=0	WA	EPA 200.7	09/14/2022 16:05	09/19/2022 14:00	1	NA
T2218971002	DI-Dup-T=0	WA	EPA 350.1	09/14/2022 16:05	09/19/2022 14:00	1	NA
T2218971002	DI-Dup-T=0	WA	EPA 365.3	09/14/2022 16:05	09/19/2022 14:00	1	NA
T2218971003	P8-Ambient-T=0	WA	EPA 200.7	09/14/2022 16:30	09/19/2022 14:00	1	NA
T2218971003	P8-Ambient-T=0	WA	EPA 350.1	09/14/2022 16:30	09/19/2022 14:00	1	NA
T2218971003	P8-Ambient-T=0	WA	EPA 365.3	09/14/2022 16:30	09/19/2022 14:00	1	NA
T2218971004	P8-Ambient Dup-T=0	WA	EPA 200.7	09/14/2022 16:35	09/19/2022 14:00	1	NA
T2218971004	P8-Ambient Dup-T=0	WA	EPA 350.1	09/14/2022 16:35	09/19/2022 14:00	1	NA
T2218971004	P8-Ambient Dup-T=0	WA	EPA 365.3	09/14/2022 16:35	09/19/2022 14:00	1	NA
T2218971005	P9-Ambient-T=0	WA	EPA 200.7	09/14/2022 16:40	09/19/2022 14:00	1	NA
T2218971005	P9-Ambient-T=0	WA	EPA 350.1	09/14/2022 16:40	09/19/2022 14:00	1	NA
T2218971005	P9-Ambient-T=0	WA	EPA 365.3	09/14/2022 16:40	09/19/2022 14:00	1	NA
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T2218971011	P9-A-T=24	WA	EPA 365.3	09/13/2022 15:25	09/19/2022 14:00	1	NA
T2218971012	WC-A-T=24	WA	EPA 200.7	09/13/2022 15:30	09/19/2022 14:00	1	NA
T2218971012	WC-A-T=24	WA	EPA 350.1	09/13/2022 15:30	09/19/2022 14:00	1	NA

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Workorder: City of Naples (T2218971)

Sample Summary

Lab ID	Sample ID	Matrix	Method	Date Collected	Date Received	Analytes Reported	Basis
T2218971012	WC-A-T=24	WA	EPA 365.3	09/13/2022 15:30	09/19/2022 14:00	1	NA
T2218971013	P8-1-T=48	WA	EPA 200.7	09/13/2022 14:00	09/19/2022 14:00	1	NA
T2218971013	P8-1-T=48	WA	EPA 350.1	09/13/2022 14:00	09/19/2022 14:00	1	NA
T2218971013	P8-1-T=48	WA	EPA 365.3	09/13/2022 14:00	09/19/2022 14:00	1	NA
T2218971014	P9-1-T=48	WA	EPA 200.7	09/14/2022 14:05	09/19/2022 14:00	1	NA
T2218971014	P9-1-T=48	WA	EPA 350.1	09/14/2022 14:05	09/19/2022 14:00	1	NA
T2218971014	P9-1-T=48	WA	EPA 365.3	09/14/2022 14:05	09/19/2022 14:00	1	NA
T2218971015	WC-1-T=48	WA	EPA 200.7	09/14/2022 14:10	09/19/2022 14:00	1	NA
T2218971015	WC-1-T=48	WA	EPA 350.1	09/14/2022 14:10	09/19/2022 14:00	1	NA
T2218971015	WC-1-T=48	WA	EPA 365.3	09/14/2022 14:10	09/19/2022 14:00	1	NA
T2218971016	P8-A-T=48	WA	EPA 200.7	09/14/2022 14:15	09/19/2022 14:00	1	NA
T2218971016	P8-A-T=48	WA	EPA 350.1	09/14/2022 14:15	09/19/2022 14:00	1	NA
T2218971016	P8-A-T=48	WA	EPA 365.3	09/14/2022 14:15	09/19/2022 14:00	1	NA
T2218971017	P9-A-T=48	WA	EPA 200.7	09/14/2022 14:20	09/19/2022 14:00	1	NA
T2218971017	P9-A-T=48	WA	EPA 350.1	09/14/2022 14:20	09/19/2022 14:00	1	NA
T2218971017	P9-A-T=48	WA	EPA 365.3	09/14/2022 14:20	09/19/2022 14:00	1	NA
T2218971018	WC-A-T=48	WA	EPA 200.7	09/14/2022 14:25	09/19/2022 14:00	1	NA
T2218971018	WC-A-T=48	WA	EPA 350.1	09/14/2022 14:25	09/19/2022 14:00	1	NA
T2218971018	WC-A-T=48	WA	EPA 365.3	09/14/2022 14:25	09/19/2022 14:00	1	NA

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FINAL

Workorder: City of Naples (T2218971)

Workorder Summary

Batch Comments

ICPt/3081 - ICP 200.7 Analysis

The matrix spike (MS) recoveries of Potassium for G2208084001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and Matrix Spike Duplicate (MSD) were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. No further corrective action is required.

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Workorder: City of Naples (T2218971)

Analytical Results Qualifiers

Parameter Qualifiers

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

Lab Qualifiers

G	DOH Certification #E82001 (FL NELAC) AEL-Gainesville
T	DOH Certification #E84589 (FL NELAC) AEL-Tampa

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971001	**Date Collected:**	09/14/2022 16:00	**Matrix:**	Water
Sample ID:	DI-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:07	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:10	09/20/2022 10:10	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.049**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

Certificate of Analysis

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971002	**Date Collected:**	09/14/2022 16:05	**Matrix:**	Water
Sample ID:	DI-Dup-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:09	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:13	09/20/2022 10:13	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.006 I**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971003	**Date Collected:**	09/14/2022 16:30	**Matrix:**	Water
Sample ID:	P8-Ambient-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.019 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:12	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.1**	mg/L	0.03	0.02	1	09/20/2022 10:14	09/20/2022 10:14	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.081**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971004	**Date Collected:**	09/14/2022 16:35	**Matrix:**	Water
Sample ID:	P8-Ambient Dup-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.019 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:15	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.09**	mg/L	0.03	0.02	1	09/20/2022 10:15	09/20/2022 10:15	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.175**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971005	**Date Collected:**	09/14/2022 16:40	**Matrix:**	Water
Sample ID:	P9-Ambient-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.042 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:18	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:16	09/20/2022 10:16	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.057**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971006	**Date Collected:**	09/14/2022 16:45	**Matrix:**	Water
Sample ID:	P9-Ambient Dup-T=0	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:27	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:17	09/20/2022 10:17	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.070**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971007	**Date Collected:**	09/13/2022 15:00	**Matrix:**	Water
Sample ID:	P8-1-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.018 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:29	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.07**	mg/L	0.03	0.02	1	09/20/2022 10:17	09/20/2022 10:17	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.081**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971008	**Date Collected:**	09/13/2022 15:05	**Matrix:**	Water
Sample ID:	P9-1-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.021 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:49	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.02 I**	mg/L	0.03	0.02	1	09/20/2022 10:18	09/20/2022 10:18	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.035**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971009	**Date Collected:**	09/13/2022 15:10	**Matrix:**	Water
Sample ID:	WC-1-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 16:52	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:19	09/20/2022 10:19	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971010	**Date Collected:**	09/13/2022 15:20	**Matrix:**	Water
Sample ID:	P8-A-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.022 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:01	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.07**	mg/L	0.03	0.02	1	09/20/2022 10:20	09/20/2022 10:20	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.086**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971011	**Date Collected:**	09/13/2022 15:25	**Matrix:**	Water
Sample ID:	P9-A-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:04	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:28	09/20/2022 10:28	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.089**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971012	**Date Collected:**	09/13/2022 15:30	**Matrix:**	Water
Sample ID:	WC-A-T=24	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:07	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:30	09/20/2022 10:30	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.014**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971013	**Date Collected:**	09/13/2022 14:00	**Matrix:**	Water
Sample ID:	P8-1-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.010 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:10	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.09**	mg/L	0.03	0.02	1	09/20/2022 10:31	09/20/2022 10:31	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.145**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971014	**Date Collected:**	09/14/2022 14:05	**Matrix:**	Water
Sample ID:	P9-1-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.0090 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:12	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.04**	mg/L	0.03	0.02	1	09/20/2022 10:32	09/20/2022 10:32	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.148**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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FINAL

Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971015	**Date Collected:**	09/14/2022 14:10	**Matrix:**	Water
Sample ID:	WC-1-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:15	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:33	09/20/2022 10:33	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.140**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:40	G

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971016	**Date Collected:**	09/14/2022 14:15	**Matrix:**	Water
Sample ID:	P8-A-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.014 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:18	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.2**	mg/L	0.03	0.02	1	09/20/2022 10:34	09/20/2022 10:34	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.062**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:55	G

Certificate of Analysis

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Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971017	**Date Collected:**	09/14/2022 14:20	**Matrix:**	Water
Sample ID:	P9-A-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.0077 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:21	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.04**	mg/L	0.03	0.02	1	09/20/2022 10:35	09/20/2022 10:35	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.122**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:55	G

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FINAL

Workorder: City of Naples (T2218971)

Analytical Results

Lab ID:	T2218971018	**Date Collected:**	09/14/2022 14:25	**Matrix:**	Water
Sample ID:	WC-A-T=48	**Date Received:**	09/19/2022 14:00		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:24	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/20/2022 10:36	09/20/2022 10:36	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.092**	mg/L	0.01	0.005	1	09/26/2022 11:10	09/26/2022 16:55	G

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Workorder: City of Naples (T2218971)

QC Results

QC Batch: ICPt/3080 **Analysis Method:** EPA 200.7
Preparation Method: EPA 200.7
Associated Lab IDs: T2218971001, T2218971002, T2218971003, T2218971004, T2218971005, T2218971006, T2218971007

Method Blank(4479974)

Parameter	Results	Units	PQL	MDL	Lab
Iron	0.0067 U	mg/L	0.10	0.0067	T

Lab Control Sample (4479975)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Iron	mg/L	1	.96	96	85 - 115	T

Matrix Spike (4479976); Matrix Spike Duplicate (4479977); Parent Lab Sample (G2208199001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	1.3	112	70 - 130	1.3	113	0	20	T

Matrix Spike (4479978); Matrix Spike Duplicate (4479979); Parent Lab Sample (F2204435002)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	1.7	107	70 - 130	1.7	107	0	20	T

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FINAL

Workorder: City of Naples (T2218971)

QC Results

QC Batch: ICPt/3081 **Analysis Method:** EPA 200.7
Preparation Method: EPA 200.7
Associated Lab IDs: T2218971008, T2218971009, T2218971010, T2218971011, T2218971012, T2218971013, T2218971014, T2218971015, T2218971016, T2218971017, T2218971018

Method Blank(4480034)

Parameter	Results	Units	PQL	MDL	Lab
Iron	0.0067 U	mg/L	0.10	0.0067	T

Lab Control Sample (4480035)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Iron	mg/L	1	.95	95	85 - 115	T

Matrix Spike (4480036); Matrix Spike Duplicate (4480037); Parent Lab Sample (T2219046001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	1.6	112	70 - 130	1.7	116	2	20	T

Matrix Spike (4480038); Matrix Spike Duplicate (4480039); Parent Lab Sample (G2208084001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	5.5	**132**	70 - 130	5.5	**136**	1	20	T

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FINAL

Workorder: City of Naples (T2218971)

QC Results

QC Batch: WCAg/8159 **Analysis Method:** EPA 365.3
Preparation Method: EPA 365.3
Associated Lab IDs: T2218971001, T2218971002, T2218971003, T2218971004, T2218971005, T2218971006, T2218971007, T2218971008, T2218971009, T2218971010, T2218971011, T2218971012, T2218971013, T2218971014, T2218971015

Method Blank(4481357)

Parameter	Results	Units	PQL	MDL	Lab
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	G

Lab Control Sample (4481358)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Total Phosphorus (as P)	mg/L	0.10	.1	100	80 - 120	G

Matrix Spike (4481360); Matrix Spike Duplicate (4481361); Parent Lab Sample (F2204541010)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Total Phosphorus (as P)	mg/L	0.25	.26	104	80 - 120	.28	111	6	20	G

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FINAL

Workorder: City of Naples (T2218971)

QC Results

QC Batch: WCAg/8161 **Analysis Method:** EPA 365.3
Preparation Method: EPA 365.3
Associated Lab IDs: T2218971016, T2218971017, T2218971018

Method Blank(4481363)

Parameter	Results	Units	PQL	MDL	Lab
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	G

Lab Control Sample (4481365)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Total Phosphorus (as P)	mg/L	0.10	.1	100	80 - 120	G

Matrix Spike (4481366); Matrix Spike Duplicate (4481367); Parent Lab Sample (T2218971016)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Total Phosphorus (as P)	mg/L	0.25	.32	104	80 - 120	.34	109	4	20	G

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Workorder: City of Naples (T2218971)

QC Results

QC Batch: WCAt/14754 **Analysis Method:** EPA 350.1

Preparation Method: EPA 350.1

Associated Lab IDs: T2218971001, T2218971002, T2218971003, T2218971004, T2218971005, T2218971006, T2218971007, T2218971008, T2218971009, T2218971010, T2218971011

Matrix Spike (4473573); Matrix Spike Duplicate (4473574); Parent Lab Sample (T2218971001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Ammonia (N)	mg/L	1	1	101	90 - 110	1	100	1	10	T

Certificate of Analysis

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FINAL

Workorder: City of Naples (T2218971)

QC Results

QC Batch: WCAt/14754 **Analysis Method:** EPA 350.1

Preparation Method: EPA 350.1

Associated Lab IDs: T2218971001, T2218971002, T2218971003, T2218971004, T2218971005, T2218971006, T2218971007, T2218971008, T2218971009, T2218971010, T2218971011, T2218971012, T2218971013, T2218971014, T2218971015, T2218971016, T2218971017, T2218971018

Method Blank(4473570)

Parameter	Results	Units	PQL	MDL	Lab
Ammonia (N)	0.02 U	mg/L	0.03	0.02	T

Lab Control Sample (4473571)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Ammonia (N)	mg/L	0.50	.5	109	90 - 110	T

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Workorder: City of Naples (T2218971)

QC Results

QC Batch: WCAt/14754 **Analysis Method:** EPA 350.1
Preparation Method: EPA 350.1
Associated Lab IDs: T2218971002, T2218971003, T2218971004, T2218971005, T2218971006, T2218971007, T2218971008, T2218971009, T2218971010, T2218971011, T2218971012, T2218971013, T2218971014, T2218971015, T2218971016, T2218971017, T2218971018

Matrix Spike (4473575); Matrix Spike Duplicate (4473576); Parent Lab Sample (T2218971011)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Ammonia (N)	mg/L	1	1	105	90 - 110	1	101	4	10	T

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FINAL

Workorder: City of Naples (T2218971)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
ICPt/3080 - EPA 200.7			
T2218971001	DI-T=0	DGMt/4792	EPA 200.7
T2218971002	DI-Dup-T=0	DGMt/4792	EPA 200.7
T2218971003	P8-Ambient-T=0	DGMt/4792	EPA 200.7
T2218971004	P8-Ambient Dup-T=0	DGMt/4792	EPA 200.7
T2218971005	P9-Ambient-T=0	DGMt/4792	EPA 200.7
T2218971006	P9-Ambient Dup-T=0	DGMt/4792	EPA 200.7
T2218971007	P8-1-T=24	DGMt/4792	EPA 200.7
ICPt/3081 - EPA 200.7			
T2218971008	P9-1-T=24	DGMt/4793	EPA 200.7
T2218971009	WC-1-T=24	DGMt/4793	EPA 200.7
T2218971010	P8-A-T=24	DGMt/4793	EPA 200.7
T2218971011	P9-A-T=24	DGMt/4793	EPA 200.7
T2218971012	WC-A-T=24	DGMt/4793	EPA 200.7
T2218971013	P8-1-T=48	DGMt/4793	EPA 200.7
T2218971014	P9-1-T=48	DGMt/4793	EPA 200.7
T2218971015	WC-1-T=48	DGMt/4793	EPA 200.7
T2218971016	P8-A-T=48	DGMt/4793	EPA 200.7
T2218971017	P9-A-T=48	DGMt/4793	EPA 200.7
T2218971018	WC-A-T=48	DGMt/4793	EPA 200.7

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Workorder: City of Naples (T2218971)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
WCAg/8159 - EPA 365.3			
T2218971001	DI-T=0	WCAg/8158	EPA 365.3
T2218971002	DI-Dup-T=0	WCAg/8158	EPA 365.3
T2218971003	P8-Ambient-T=0	WCAg/8158	EPA 365.3
T2218971004	P8-Ambient Dup-T=0	WCAg/8158	EPA 365.3
T2218971005	P9-Ambient-T=0	WCAg/8158	EPA 365.3
T2218971006	P9-Ambient Dup-T=0	WCAg/8158	EPA 365.3
T2218971007	P8-1-T=24	WCAg/8158	EPA 365.3
T2218971008	P9-1-T=24	WCAg/8158	EPA 365.3
T2218971009	WC-1-T=24	WCAg/8158	EPA 365.3
T2218971010	P8-A-T=24	WCAg/8158	EPA 365.3
T2218971011	P9-A-T=24	WCAg/8158	EPA 365.3
T2218971012	WC-A-T=24	WCAg/8158	EPA 365.3
T2218971013	P8-1-T=48	WCAg/8158	EPA 365.3
T2218971014	P9-1-T=48	WCAg/8158	EPA 365.3
T2218971015	WC-1-T=48	WCAg/8158	EPA 365.3
WCAg/8161 - EPA 365.3			
T2218971016	P8-A-T=48	WCAg/8160	EPA 365.3
T2218971017	P9-A-T=48	WCAg/8160	EPA 365.3
T2218971018	WC-A-T=48	WCAg/8160	EPA 365.3

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Workorder: City of Naples (T2218971)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
WCAt/14754 - EPA 350.1			
T2218971001	DI-T=0		
T2218971002	DI-Dup-T=0		
T2218971003	P8-Ambient-T=0		
T2218971004	P8-Ambient Dup-T=0		
T2218971005	P9-Ambient-T=0		
T2218971006	P9-Ambient Dup-T=0		
T2218971007	P8-1-T=24		
T2218971008	P9-1-T=24		
T2218971009	WC-1-T=24		
T2218971010	P8-A-T=24		
T2218971011	P9-A-T=24		
T2218971012	WC-A-T=24		
T2218971013	P8-1-T=48		
T2218971014	P9-1-T=48		
T2218971015	WC-1-T=48		
T2218971016	P8-A-T=48		
T2218971017	P9-A-T=48		
T2218971018	WC-A-T=48		

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Workorder: City of Naples (T2218971)

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☐ **Fort Myers:** 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Lab ID: E84492
☐ **Jacksonville:** 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Lab ID: E82574
☐ **Tallahassee:** 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Lab ID: E811095
☐ **Gainesville:** 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Lab ID: E82001
☐ **Miramar:** 10200 USA Today Way, FL 33025 • 954.889.2288 • Lab ID: E82535
☒ **Tampa:** 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Lab ID: E84589

Page 1 of 2

Client Name: Wood, PLC
Address: 1101 Channelside Dr. Unit 200 Tampa, FL
Phone:
FAX:
Contact: Francesca Lauterman
Sampled By: F. Lauterman
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile: 71406

Project: City of Naples
Project Number: 600843.05
PO Number: 600843.05.6067.573000
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

ANALYSIS REQUIRED: Fe | Ammonia (Chem) | TBLL (GNV)
BOTTLE SIZE & TYPE
Preservation: ✓ | ✓ | ✓
Field-Filtered?

SAMPLE ID	SAMPLE DESCRIPTION	Grab / Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	Fe	Ammonia (Chem)	TBLL (GNV)	LABORATORY I.D. NUMBER
	DI-T=0	Grab	9/14/22	1600	SW	3	✓	✓	✓	001
	DI-Dup-T=0	↓	9/14/22	1605	↓	↓	✓	✓	✓	002
	B8-Ambient-T=0	↓	9/14/22	1636	↓	↓	✓	✓	✓	003
	B8-Ambient-Dup-T=0	↓	9/14/22	1635	↓	↓	✓	✓	✓	004
	B9-Ambient-T=0	↓	9/14/22	1640	↓	↓	✓	✓	✓	005
	B9-Ambient Dup-T=0	↓	9/14/22	1645	↓	↓	✓	✓	✓	006
	B8-1-T=24	↓	9/13/22	1500	↓	↓	✓	✓	✓	007
	B9-1-T=24	↓	9/13/22	1505	↓	↓	✓	✓	✓	008
	WC-1-T=24	↓	9/13/22	1510	↓	↓	✓	✓	✓	009
	B8-A-T=24	↓	9/13/22	1520	↓	↓	✓	✓	✓	010

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = Ice H=(HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☒ Where required, pH checked

Temp. when received (observed)_____ °C Temp when received (corrected) 6 °C

DCN: AD-D051 Form last revised 08/07/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	9/14/22	2 pm	[signature]	9/19/22	1400
2						
3						
4						

FOR DRINKING WATER USE:
(When PWS information not otherwise supplied) PWS ID:
Contact Person: Phone:
Supplier of Water:
Site-Address:

T2218971

Certificate of Analysis

NELAP Accredited E84589

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Workorder: City of Naples (T2218971)

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☑ **Tampa:** 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Lab ID: E84589

Page 2 of 2

Client Name: Wood, PLC
Address: Wood Chmelsile
Phone:
FAX:
Contact: Francesca Lauterman
Sampled By: F. Lauterman
Turn Around Time: ☑ STANDARD ☐ RUSH
AEL Profile: 71406

Project: City of Naples
Project Number: 600843.03
PO Number: 600843.05.6067. 573000
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

ANALYSIS REQUIRED: Fe | Ammonia | TPLL
Preservation: ✓ | ✓ | ✓

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	Fe	Ammonia	TPLL	LABORATORY I.D. NUMBER
	P9-A-T=24	Grab	9/13/22	1525	SU	3	✓	✓	✓	011
	WC-A-T=24	↓	9/13/22	1530	↓	↓	✓	✓	✓	012
	P8-1-T=48	↓	9/14/22	1400	↓	↓	✓	✓	✓	013
	P9-1-T=48	↓	9/14/22	1405	↓	↓	✓	✓	✓	014
	WC-1-T=48	↓	9/14/22	1410	↓	↓	✓	✓	✓	015
	P8-A-T=48	↓	9/14/22	1415	↓	↓	✓	✓	✓	016
	P9-A-T=48	↓	9/14/22	1420	↓	↓	✓	✓	✓	017
	WC-A-T=48	↓	9/14/22	1425	↓	↓	✓	✓	✓	018

Matrix Code: **WW** = wastewater **SW** = surface water **GW** = ground water **DW** = drinking water **O** = oil **A** = air **SO** = soil **SL** = sludge
Preservation Code: I = ice H=(HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on Ice ☑ Yes ☐ No ☑ Temp taken from sample ☐ Temp from blank ☑ Where required, pH checked
Temp. when received (observed)____ °C Temp. when received (corrected) 6 °C
DCN: AD-D051 Form last revised 08/07/2019
Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	9/19/22	2pm	[signature]	9/19/22	1400
2						
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:
Contact Person: Phone:
Supplier of Water:
Site-Address:

* T 2 2 1 8 9 7 1 *

Certificate of Analysis

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Workorder: City of Naples (T2219139)

October 06, 2022

Francesca Lauterman
Wood EIS
1101 Channelside
Suite 200
Tampa, FL 33602

RE: Workorder: T2219139 City of Naples

Dear Francesca Lauterman:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday September 21, 2022. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. The analytical results for the samples contained in this report were submitted for analysis as outlined by the Chain of Custody and results pertain only to these samples.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sue Bell, Sr Project Manager
SBell@aellab.com

ATTACHMENT A

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Workorder: City of Naples (T2219139)

Sample Summary

Lab ID	Sample ID	Matrix	Method	Date Collected	Date Received	Analytes Reported	Basis
T2219139001	P8-1 T=96	WA	EPA 200.7	09/16/2022 14:00	09/21/2022 12:40	1	NA
T2219139001	P8-1 T=96	WA	EPA 350.1	09/16/2022 14:00	09/21/2022 12:40	1	NA
T2219139001	P8-1 T=96	WA	EPA 365.3	09/16/2022 14:00	09/21/2022 12:40	1	NA
T2219139002	P9-1 T=96	WA	EPA 200.7	09/16/2022 14:05	09/21/2022 12:40	1	NA
T2219139002	P9-1 T=96	WA	EPA 350.1	09/16/2022 14:05	09/21/2022 12:40	1	NA
T2219139002	P9-1 T=96	WA	EPA 365.3	09/16/2022 14:05	09/21/2022 12:40	1	NA
T2219139003	WC-1 T=96	WA	EPA 200.7	09/16/2022 14:10	09/21/2022 12:40	1	NA
T2219139003	WC-1 T=96	WA	EPA 350.1	09/16/2022 14:10	09/21/2022 12:40	1	NA
T2219139003	WC-1 T=96	WA	EPA 365.3	09/16/2022 14:10	09/21/2022 12:40	1	NA
T2219139004	P8-A T=96	WA	EPA 200.7	09/16/2022 14:15	09/21/2022 12:40	1	NA
T2219139004	P8-A T=96	WA	EPA 350.1	09/16/2022 14:15	09/21/2022 12:40	1	NA
T2219139004	P8-A T=96	WA	EPA 365.3	09/16/2022 14:15	09/21/2022 12:40	1	NA
T2219139005	P9-A T=96	WA	EPA 200.7	09/16/2022 14:20	09/21/2022 12:40	1	NA
T2219139005	P9-A T=96	WA	EPA 350.1	09/16/2022 14:20	09/21/2022 12:40	1	NA
T2219139005	P9-A T=96	WA	EPA 365.3	09/16/2022 14:20	09/21/2022 12:40	1	NA
T2219139006	WC-A T=96	WA	EPA 200.7	09/16/2022 14:25	09/21/2022 12:40	1	NA
T2219139006	WC-A T=96	WA	EPA 350.1	09/16/2022 14:25	09/21/2022 12:40	1	NA
T2219139006	WC-A T=96	WA	EPA 365.3	09/16/2022 14:25	09/21/2022 12:40	1	NA
T2219139007	P8-1 T=168	WA	EPA 200.7	09/19/2022 12:30	09/21/2022 12:40	1	NA
T2219139007	P8-1 T=168	WA	EPA 350.1	09/19/2022 12:30	09/21/2022 12:40	1	NA
T2219139007	P8-1 T=168	WA	EPA 365.3	09/19/2022 12:30	09/21/2022 12:40	1	NA
T2219139008	P9-1 T=168	WA	EPA 200.7	09/19/2022 12:35	09/21/2022 12:40	1	NA
T2219139008	P9-1 T=168	WA	EPA 350.1	09/19/2022 12:35	09/21/2022 12:40	1	NA
T2219139008	P9-1 T=168	WA	EPA 365.3	09/19/2022 12:35	09/21/2022 12:40	1	NA
T2219139009	WC-1 T=168	WA	EPA 200.7	09/19/2022 12:40	09/21/2022 12:40	1	NA
T2219139009	WC-1 T=168	WA	EPA 350.1	09/19/2022 12:40	09/21/2022 12:40	1	NA
T2219139009	WC-1 T=168	WA	EPA 365.3	09/19/2022 12:40	09/21/2022 12:40	1	NA
T2219139010	P8-A T=168	WA	EPA 200.7	09/19/2022 12:45	09/21/2022 12:40	1	NA
T2219139010	P8-A T=168	WA	EPA 350.1	09/19/2022 12:45	09/21/2022 12:40	1	NA
T2219139010	P8-A T=168	WA	EPA 365.3	09/19/2022 12:45	09/21/2022 12:40	1	NA
T2219139011	P9-A T=168	WA	EPA 200.7	09/19/2022 12:50	09/21/2022 12:40	1	NA
T2219139011	P9-A T=168	WA	EPA 350.1	09/19/2022 12:50	09/21/2022 12:40	1	NA
T2219139011	P9-A T=168	WA	EPA 365.3	09/19/2022 12:50	09/21/2022 12:40	1	NA
T2219139012	WC-A T=168	WA	EPA 200.7	09/19/2022 12:55	09/21/2022 12:40	1	NA
T2219139012	WC-A T=168	WA	EPA 350.1	09/19/2022 12:55	09/21/2022 12:40	1	NA

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Workorder: City of Naples (T2219139)

Sample Summary

Lab ID	Sample ID	Matrix	Method	Date Collected	Date Received	Analytes Reported	Basis
T2219139012	WC-A T=168	WA	EPA 365.3	09/19/2022 12:55	09/21/2022 12:40	1	NA
T2219139013	P8-1 T=216	WA	EPA 200.7	09/21/2022 11:10	09/21/2022 12:40	1	NA
T2219139013	P8-1 T=216	WA	EPA 350.1	09/21/2022 11:10	09/21/2022 12:40	1	NA
T2219139013	P8-1 T=216	WA	EPA 365.3	09/21/2022 11:10	09/21/2022 12:40	1	NA
T2219139014	P9-1 T=216	WA	EPA 200.7	09/21/2022 11:15	09/21/2022 12:40	1	NA
T2219139014	P9-1 T=216	WA	EPA 350.1	09/21/2022 11:15	09/21/2022 12:40	1	NA
T2219139014	P9-1 T=216	WA	EPA 365.3	09/21/2022 11:15	09/21/2022 12:40	1	NA
T2219139015	WC-1 T=216	WA	EPA 200.7	09/21/2022 11:20	09/21/2022 12:40	1	NA
T2219139015	WC-1 T=216	WA	EPA 350.1	09/21/2022 11:20	09/21/2022 12:40	1	NA
T2219139015	WC-1 T=216	WA	EPA 365.3	09/21/2022 11:20	09/21/2022 12:40	1	NA
T2219139016	P8-A T=216	WA	EPA 200.7	09/21/2022 11:25	09/21/2022 12:40	1	NA
T2219139016	P8-A T=216	WA	EPA 350.1	09/21/2022 11:25	09/21/2022 12:40	1	NA
T2219139016	P8-A T=216	WA	EPA 365.3	09/21/2022 11:25	09/21/2022 12:40	1	NA
T2219139017	P9-A T=216	WA	EPA 200.7	09/21/2022 11:30	09/21/2022 12:40	1	NA
T2219139017	P9-A T=216	WA	EPA 350.1	09/21/2022 11:30	09/21/2022 12:40	1	NA
T2219139017	P9-A T=216	WA	EPA 365.3	09/21/2022 11:30	09/21/2022 12:40	1	NA
T2219139018	WC-A T=216	WA	EPA 200.7	09/21/2022 11:35	09/21/2022 12:40	1	NA
T2219139018	WC-A T=216	WA	EPA 350.1	09/21/2022 11:35	09/21/2022 12:40	1	NA
T2219139018	WC-A T=216	WA	EPA 365.3	09/21/2022 11:35	09/21/2022 12:40	1	NA

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Workorder: City of Naples (T2219139)

Workorder Summary

Batch Comments

ICPt/3081 - ICP 200.7 Analysis

The matrix spike (MS) recoveries of Potassium for G2208084001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and Matrix Spike Duplicate (MSD) were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. No further corrective action is required.

ICPt/3091 - ICP 200.7 Analysis

The matrix spike (MS) and Matrix Spike Duplicate (MSD) recoveries of Iron and Sodium for G2208259001 were outside control criteria. Recoveries in the Laboratory Control Sample (LCS) were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. No further corrective action is required.

WCAt/14882 - Ammonia,E350.1,Water

The matrix spike recovery of Ammonia (N) for T2219090001 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and % RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. No further corrective action was required.

WCAt/14885 - Ammonia,E350.1,Water

The matrix spike recovery of Ammonia (N) for T2219139013 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and % RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. No further corrective action was required.

Task Comments

T2219139013 (P8-1 T=216) - WCAt/14885 - Ammonia,E350.1,Water

The matrix spike recovery of Ammonia (N) for T2219139013 was outside control criteria. Recoveries in the Laboratory Control Sample (LCS) and % RPD were acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. No further corrective action was required.

Analysis Results Comments

T2219139013 (P8-1 T=216) - Ammonia (N)

J4|Estimated Result

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Workorder: City of Naples (T2219139)

Analytical Results Qualifiers

Parameter Qualifiers

U	The compound was analyzed for but not detected.
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J4	Estimated Result

Lab Qualifiers

G	DOH Certification #E82001 (FL NELAC) AEL-Gainesville
T	DOH Certification #E84589 (FL NELAC) AEL-Tampa

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139001	**Date Collected:**	09/16/2022 14:00	**Matrix:**	Water
Sample ID:	P8-1 T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.013 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:27	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.08**	mg/L	0.03	0.02	1	09/26/2022 15:31	09/26/2022 15:31	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.078**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139002	**Date Collected:**	09/16/2022 14:05	**Matrix:**	Water
Sample ID:	P9-1 T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.010 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:35	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/26/2022 13:16	09/26/2022 13:16	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.038**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139003	**Date Collected:**	09/16/2022 14:10	**Matrix:**	Water
Sample ID:	WC-1 T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:38	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.02 U	mg/L	0.03	0.02	1	09/26/2022 13:17	09/26/2022 13:17	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.009 I**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139004	**Date Collected:**	09/16/2022 14:15	**Matrix:**	Water
Sample ID:	P8-A T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.016 I**	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:41	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:25	09/26/2022 13:25	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.065**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139005	**Date Collected:**	09/16/2022 14:20	**Matrix:**	Water
Sample ID:	P9-A T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:44	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.03**	mg/L	0.03	0.01	1	09/26/2022 13:26	09/26/2022 13:26	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139006	**Date Collected:**	09/16/2022 14:25	**Matrix:**	Water
Sample ID:	WC-A T=96	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/23/2022 10:00	09/23/2022 17:47	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.01 U	mg/L	0.03	0.01	1	09/26/2022 13:27	09/26/2022 13:27	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.006 I**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139007	**Date Collected:**	09/19/2022 12:30	**Matrix:**	Water
Sample ID:	P8-1 T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.013 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 14:48	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:28	09/26/2022 13:28	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.049**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139008	**Date Collected:**	09/19/2022 12:35	**Matrix:**	Water
Sample ID:	P9-1 T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.012 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 14:50	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:29	09/26/2022 13:29	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139009	**Date Collected:**	09/19/2022 12:40	**Matrix:**	Water
Sample ID:	WC-1 T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 14:53	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.01 U	mg/L	0.03	0.01	1	09/26/2022 13:30	09/26/2022 13:30	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.009 I**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139010	**Date Collected:**	09/19/2022 12:45	**Matrix:**	Water
Sample ID:	P8-A T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.018 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 14:56	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.2**	mg/L	0.03	0.01	1	09/26/2022 13:31	09/26/2022 13:31	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.065**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139011	**Date Collected:**	09/19/2022 12:50	**Matrix:**	Water
Sample ID:	P9-A T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.0080 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 14:59	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.03**	mg/L	0.03	0.01	1	09/26/2022 13:32	09/26/2022 13:32	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.022**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139012	**Date Collected:**	09/19/2022 12:55	**Matrix:**	Water
Sample ID:	WC-A T=168	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.017 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:02	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.01 U	mg/L	0.03	0.01	1	09/26/2022 13:33	09/26/2022 13:33	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139013	**Date Collected:**	09/21/2022 11:10	**Matrix:**	Water
Sample ID:	P8-1 T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.015 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:05	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:34	09/26/2022 13:34	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139014	**Date Collected:**	09/21/2022 11:15	**Matrix:**	Water
Sample ID:	P9-1 T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.012 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:08	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:43	09/26/2022 13:43	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.006 I**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139015	**Date Collected:**	09/21/2022 11:20	**Matrix:**	Water
Sample ID:	WC-1 T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	0.0067 U	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:10	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.01 U	mg/L	0.03	0.01	1	09/26/2022 13:46	09/26/2022 13:46	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

NELAP Accredited E84589

ATTACHMENT A

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Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (813) 630-9616
Fax: (813) 630-4327

FINAL

Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139016	**Date Collected:**	09/21/2022 11:25	**Matrix:**	Water
Sample ID:	P8-A T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.019 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:19	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.3**	mg/L	0.03	0.01	1	09/26/2022 13:47	09/26/2022 13:47	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	**0.033**	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

Certificate of Analysis

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FINAL

Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139017	**Date Collected:**	09/21/2022 11:30	**Matrix:**	Water
Sample ID:	P9-A T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.0075 I**	mg/L	0.10	0.0067	1	09/27/2022 09:30	09/30/2022 15:22	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	**0.05**	mg/L	0.03	0.01	1	09/26/2022 13:47	09/26/2022 13:47	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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FINAL

Workorder: City of Naples (T2219139)

Analytical Results

Lab ID:	T2219139018	**Date Collected:**	09/21/2022 11:35	**Matrix:**	Water
Sample ID:	WC-A T=216	**Date Received:**	09/21/2022 12:40		

Parameter	Results	Units	PQL	MDL	DF	Prepared	Analyzed	Lab
METALS (EPA 200.7)								
Iron	**0.099 I**	mg/L	0.10	0.0067	1	09/30/2022 15:00	10/01/2022 13:23	T
WET CHEMISTRY (EPA 350.1)								
Ammonia (N)	0.01 U	mg/L	0.03	0.01	1	09/26/2022 13:48	09/26/2022 13:48	T
WET CHEMISTRY (EPA 365.3)								
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	1	10/03/2022 11:20	10/04/2022 11:45	G

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Fax: (813) 630-4327

FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: ICPt/3081 **Analysis Method:** EPA 200.7
Preparation Method: EPA 200.7
Associated Lab IDs: T2219139001, T2219139002, T2219139003, T2219139004, T2219139005, T2219139006

Method Blank(4480034)

Parameter	Results	Units	PQL	MDL	Lab
Iron	0.0067 U	mg/L	0.10	0.0067	T

Lab Control Sample (4480035)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Iron	mg/L	1	.95	95	85 - 115	T

Matrix Spike (4480036); Matrix Spike Duplicate (4480037); Parent Lab Sample (T2219046001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	1.6	112	70 - 130	1.7	116	2	20	T

Matrix Spike (4480038); Matrix Spike Duplicate (4480039); Parent Lab Sample (G2208084001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	5.5	**132**	70 - 130	5.5	**136**	1	20	T

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: ICPt/3089 **Analysis Method:** EPA 200.7
Preparation Method: EPA 200.7
Associated Lab IDs: T2219139007, T2219139008, T2219139009, T2219139010, T2219139011, T2219139012, T2219139013, T2219139014, T2219139015, T2219139016, T2219139017

Method Blank(4485801)

Parameter	Results	Units	PQL	MDL	Lab
Iron	0.0067 U	mg/L	0.10	0.0067	T

Matrix Spike (4485803); Matrix Spike Duplicate (4485804); Parent Lab Sample (G2208246001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	1.4	96	70 - 130	1.3	90	4	20	T

Matrix Spike (4485805); Matrix Spike Duplicate (4485806); Parent Lab Sample (T2219139017)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	.89	88	70 - 130	.89	88	0	20	T

Lab Control Sample (4485802)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Iron	mg/L	1	.9	90	85 - 115	T

QC Result Comments

Lab Control Sample - 4485802 - Iron

J3|Lab QC Failure

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: ICPt/3091 **Analysis Method:** EPA 200.7
Preparation Method: EPA 200.7
Associated Lab IDs: T2219139018

Method Blank(4486442)

Parameter	Results	Units	PQL	MDL	Lab
Iron	0.0067 U	mg/L	0.10	0.0067	T

Lab Control Sample (4486443)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Iron	mg/L	1	1	101	85 - 115	T

Matrix Spike (4486444); Matrix Spike Duplicate (4486445); Parent Lab Sample (G2208202003)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	6.3	84	70 - 130	6.5	99	2	20	T

Matrix Spike (4486446); Matrix Spike Duplicate (4486447); Parent Lab Sample (G2208259001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Iron	mg/L	1	3.5	117	70 - 130	4.1	**175**	15	20	T

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: WCAg/8231 **Analysis Method:** EPA 365.3
Preparation Method: EPA 365.3
Associated Lab IDs: T2219139001, T2219139002, T2219139003, T2219139004, T2219139005, T2219139006, T2219139007, T2219139008, T2219139009, T2219139010, T2219139011, T2219139012, T2219139013, T2219139014, T2219139015, T2219139016, T2219139017, T2219139018

Method Blank(4487710)

Parameter	Results	Units	PQL	MDL	Lab
Total Phosphorus (as P)	0.005 U	mg/L	0.01	0.005	G

Lab Control Sample (4487711)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Total Phosphorus (as P)	mg/L	0.10	.09	94	80 - 120	G

Matrix Spike (4487713); Matrix Spike Duplicate (4487714); Parent Lab Sample (S2202389001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Total Phosphorus (as P)	mg/L	0.25	.38	96	80 - 120	.38	93	2	20	G

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: WCAt/14882 **Analysis Method:** EPA 350.1
Preparation Method: EPA 350.1
Associated Lab IDs: T2219139001, T2219139002, T2219139003

Method Blank(4481128)

Parameter	Results	Units	PQL	MDL	Lab
Ammonia (N)	0.02 U	mg/L	0.03	0.02	T

Lab Control Sample (4481129)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Ammonia (N)	mg/L	0.50	.5	105	90 - 110	T

Matrix Spike (4481132); Matrix Spike Duplicate (4481133); Parent Lab Sample (T2219090001)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Ammonia (N)	mg/L	1	.7	**12**	90 - 110	.7	**16**	7	10	T

QC Result Comments

Matrix Spike - 4481132 - Ammonia (N)

J4|Estimated Result

Matrix Spike Duplicate - 4481133 - Ammonia (N)

J4|Estimated Result

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: WCAt/14885 **Analysis Method:** EPA 350.1
Preparation Method: EPA 350.1
Associated Lab IDs: T2219139004, T2219139005, T2219139006, T2219139007, T2219139008, T2219139009, T2219139010, T2219139011, T2219139012, T2219139013, T2219139014

Matrix Spike (4481144); Matrix Spike Duplicate (4481145); Parent Lab Sample (T2219139013)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Ammonia (N)	mg/L	1	.5	**23**	90 - 110	.3	**2**	**51**	10	T

QC Result Comments

Matrix Spike - 4481144 - Ammonia (N)

J4|Estimated Result

Matrix Spike Duplicate - 4481145 - Ammonia (N)

J4|Estimated Result

Certificate of Analysis

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: WCAt/14885 **Analysis Method:** EPA 350.1
Preparation Method: EPA 350.1
Associated Lab IDs: T2219139004, T2219139005, T2219139006, T2219139007, T2219139008, T2219139009, T2219139010, T2219139011, T2219139012, T2219139013, T2219139014, T2219139015, T2219139016, T2219139017, T2219139018

Method Blank(4481142)

Parameter	Results	Units	PQL	MDL	Lab
Ammonia (N)	0.01 U	mg/L	0.03	0.01	T

Lab Control Sample (4481143)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Lab
Ammonia (N)	mg/L	0.50	.5	107	90 - 110	T

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FINAL

Workorder: City of Naples (T2219139)

QC Results

QC Batch: WCAt/14885 **Analysis Method:** EPA 350.1
Preparation Method: EPA 350.1
Associated Lab IDs: T2219139014, T2219139015, T2219139016, T2219139017, T2219139018

Matrix Spike (4481146); Matrix Spike Duplicate (4481147); Parent Lab Sample (T2219139014)

Parameter	Units	Spiked Amount	Spike Result	Spike Recovery	Control Limits	Dup Result	Dup Recovery	RPD	RPD Limit	Lab
Ammonia (N)	mg/L	1	1	109	90 - 110	1	104	4	10	T

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FINAL

Workorder: City of Naples (T2219139)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
ICPt/3081 - EPA 200.7			
T2219139001	P8-1 T=96	DGMt/4793	EPA 200.7
T2219139002	P9-1 T=96	DGMt/4793	EPA 200.7
T2219139003	WC-1 T=96	DGMt/4793	EPA 200.7
T2219139004	P8-A T=96	DGMt/4793	EPA 200.7
T2219139005	P9-A T=96	DGMt/4793	EPA 200.7
T2219139006	WC-A T=96	DGMt/4793	EPA 200.7
ICPt/3089 - EPA 200.7			
T2219139007	P8-1 T=168	DGMt/4808	EPA 200.7
T2219139008	P9-1 T=168	DGMt/4808	EPA 200.7
T2219139009	WC-1 T=168	DGMt/4808	EPA 200.7
T2219139010	P8-A T=168	DGMt/4808	EPA 200.7
T2219139011	P9-A T=168	DGMt/4808	EPA 200.7
T2219139012	WC-A T=168	DGMt/4808	EPA 200.7
T2219139013	P8-1 T=216	DGMt/4808	EPA 200.7
T2219139014	P9-1 T=216	DGMt/4808	EPA 200.7
T2219139015	WC-1 T=216	DGMt/4808	EPA 200.7
T2219139016	P8-A T=216	DGMt/4808	EPA 200.7
T2219139017	P9-A T=216	DGMt/4808	EPA 200.7
ICPt/3091 - EPA 200.7			
T2219139018	WC-A T=216	DGMt/4816	EPA 200.7

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FINAL

Workorder: City of Naples (T2219139)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
WCAg/8231 - EPA 365.3			
T2219139001	P8-1 T=96	WCAg/8230	EPA 365.3
T2219139002	P9-1 T=96	WCAg/8230	EPA 365.3
T2219139003	WC-1 T=96	WCAg/8230	EPA 365.3
T2219139004	P8-A T=96	WCAg/8230	EPA 365.3
T2219139005	P9-A T=96	WCAg/8230	EPA 365.3
T2219139006	WC-A T=96	WCAg/8230	EPA 365.3
T2219139007	P8-1 T=168	WCAg/8230	EPA 365.3
T2219139008	P9-1 T=168	WCAg/8230	EPA 365.3
T2219139009	WC-1 T=168	WCAg/8230	EPA 365.3
T2219139010	P8-A T=168	WCAg/8230	EPA 365.3
T2219139011	P9-A T=168	WCAg/8230	EPA 365.3
T2219139012	WC-A T=168	WCAg/8230	EPA 365.3
T2219139013	P8-1 T=216	WCAg/8230	EPA 365.3
T2219139014	P9-1 T=216	WCAg/8230	EPA 365.3
T2219139015	WC-1 T=216	WCAg/8230	EPA 365.3
T2219139016	P8-A T=216	WCAg/8230	EPA 365.3
T2219139017	P9-A T=216	WCAg/8230	EPA 365.3
T2219139018	WC-A T=216	WCAg/8230	EPA 365.3
WCAt/14882 - EPA 350.1			
T2219139001	P8-1 T=96		
T2219139002	P9-1 T=96		
T2219139003	WC-1 T=96		

Certificate of Analysis

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FINAL

Workorder: City of Naples (T2219139)

QC Cross Reference

Lab ID	Sample ID	Prep Batch	Prep Method
WCAt/14885 - EPA 350.1			
T2219139004	P8-A T=96		
T2219139005	P9-A T=96		
T2219139006	WC-A T=96		
T2219139007	P8-1 T=168		
T2219139008	P9-1 T=168		
T2219139009	WC-1 T=168		
T2219139010	P8-A T=168		
T2219139011	P9-A T=168		
T2219139012	WC-A T=168		
T2219139013	P8-1 T=216		
T2219139014	P9-1 T=216		
T2219139015	WC-1 T=216		
T2219139016	P8-A T=216		
T2219139017	P9-A T=216		
T2219139018	WC-A T=216		

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FINAL

Workorder: City of Naples (T2219139)

Advanced Environmental Laboratories, Inc.

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☐ Fort Myers: 13100 Westlinks Terrace, Ste. 10, FL 33913 • 239.674.8130 • Lab ID: E84492
☐ Jacksonville: 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Lab ID: E82574
☐ Tallahassee: 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Lab ID: E811095
☐ Gainesville: 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Lab ID: E82001
☐ Miramar: 10200 USA Today Way, FL 33025 • 954.889.2288 • Lab ID: E82535
☑ Tampa: 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Lab ID: E84589

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T2219139

Client Name: Wood, PLC
Address: PLC Wood, 1101 Channelside Dr. Tamp
Phone: 352-702-1254
FAX:
Contact: Francesca Lauterman
Sampled By: F. Lauterman
Turn Around Time: ☑ STANDARD ☐ RUSH
AEL Profile: 71406

Project: City of Naples
Project Number: 600843.05
PO Number: 600843.05.6067. 573000
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

Analysis Required: Fe ✓, T8LL ✓, Ammonia ✓

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	DATE	TIME	MATRIX	NO. COUNT	Fe	T8LL	Ammonia	LAB
	P8-1-T=96	Grab	9/16/22	1400	SW	3	–	–	–	001
	P9-1-T=96		9/16/22	1405	SW	3	–	–	–	002
	WC-1-T=96		9/16/22	1410	SW	3	–	–	–	003
	P8-A-T=96		9/16/22	1415	SW	3	–	–	–	004
	P9-A-T=96		9/16/22	1420	SW	3	–	–	–	005
	WC-A-T=96		9/16/22	1425	SW	3	–	–	–	006
	P8-1-T=168		9/19/22	1230	SW	3	–	–	–	007
	P9-1-T=168		9/19/22	1235	SW	3	–	–	–	008
	WC-1-T=168		9/19/22	1240	SW	3	–	–	–	009
	P8-A-T=168		9/19/22	1245	SW	3	–	–	–	010

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge
Preservation Code: I = ice H=(HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on ice ☑ Yes ☐ No ☑ Temp taken from sample ☐ Temp from blank ☑ Where required, pH checked
Temp. when received (observed) 4 °C Temp. when received (corrected) ____ °C
DCN: AD-D051 Form last revised 08/07/2019
Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	9/21/22		CB	9/21/22	1240
2						
3						
4						

FOR DRINKING WATER USE:
(When PWS information not otherwise supplied) PWS ID: ____
Contact Person: ____ Phone: ____
Supplier of Water: ____
Site-Address: ____

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Workorder: City of Naples (T2219139)

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☐ **Jacksonville:** 6681 Southpoint Pkwy., FL 32216 • 904.363.9350 • Lab ID: E82574
☐ **Tallahassee:** 2639 North Monroe St., Suite D, FL 32303 • 850.219.6274 • Lab ID: E811095
☐ **Gainesville:** 4965 SW 41st Blvd., FL 32608 • 352.377.2349 • Lab ID: E82001
☐ **Miramar:** 10200 USA Today Way, FL 33025 • 954.889.2288 • Lab ID: E82535
☒ **Tampa:** 9610 Princess Palm Ave., FL 33619 • 813.630.9616 • Lab ID: E84589

Page 2 of 2

Client Name: Wood, PLC
Address: Wood PLC
1101 Channelside Dr, Tampa
Phone: 352-702-1254
FAX:
Contact: Francesca Lauterman
Sampled By: F. Lauterman
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile: 71406

Project: City of Naples
Project Number: 600843.05
PO Number: 600843.05.6067.
573000
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

BOTTLE SIZE & TYPE

ANALYSIS REQUIRED: Fe | TBLL | Ammonia
Preservation: ✓ | ✓ | ✓
Field-Filtered?:

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	Fe	TBLL	Ammonia	LABORATORY I.D. NUMBER
	P9-A-T=168	Grab	9/19/22	1250	SW	3	-	-	-	011
	WC-A-T=168		9/19/22	1255	SW	3	-	-	-	012
	P8-1-T=216		9/21/22	1110	SW	3	-	-	-	013
	P9-1-T=216		9/21/22	1115	SW	3	-	-	-	014
	WC-1-T=216		9/21/22	1120	SW	3	-	-	-	015
	P8-A-T=216		9/21/22	1125	SW	3	-	-	-	016
	P9-A-T=216		9/21/22	1130	SW	3	-	-	-	017
	WC-A-T=216		9/21/22	1135	SW	3	-	-	-	018

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water O = oil A = air SO = soil SL = sludge

Preservation Code: I = ice H=(HCl) S = (H2SO4) N = (HNO3) T = (Sodium Thiosulfate)

Received on Ice ☒ Yes ☐ No ☒ Temp taken from sample ☐ Temp from blank ☒ Where required, pH checked

Temp. when received (observed) Ice °C Temp. when received (corrected) ______ °C

DCN: AD-D051 Form last revised 08/07/2019

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	9/21/22		[signature]	9/21/22	1240
2						
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID: ______
Contact Person: ______ Phone: ______
Supplier of Water: ______
Site-Address: ______

ATTACHMENT A

APPENDIX 4 – CORE PHOTO LOG

ATTACHMENT A

Descriptions and Photos: Sediment Core Profiles

Client: City of Naples **Site Name:** North Lake (Lake 8) **Project Number:** 600843.01

Sample Location and Name:	Description:
P8-1, Anoxic	0-1 cm (top) – Brown organic, flocculant 1-26 cm – Brown, tan, gray sand mixture with some shell and detrital material

ATTACHMENT A

Descriptions and Photos: Sediment Core Profiles

Client: City of Naples **Site Name:** South Lake (Lake 9) **Project Number:** 600843.01

Sample Location and Name:
P9-1, Anoxic

Description:
0-13 cm – Brown, tan, gray sand mixture with some detrital material
13-15 cm – Dark brown sediment and brown sand
15-27 cm – Tan and gray sand mixture with some detrital material

ATTACHMENT A

Descriptions and Photos: Sediment Core Profiles

Client: City of Naples **Site Name:** North Lake (Lake 8) **Project Number:** 600843.01

Sample Location and Name:
P8-A, Aerobic

Description:
0-27 cm – Brown, tan, gray sand mixture with some shell and detrital material

ATTACHMENT A

Descriptions and Photos: Sediment Core Profiles

Client: City of Naples **Site Name:** South Lake (Lake 9) **Project Number:** 600843.01

Sample Location and Name:
P9-A, Aerobic

Description:
0-13 cm – Brown, tan, gray sand mixture with some detrital material
13-15 cm – Dark brown sediment and brown sand
15-27 cm – Tan and gray sand mixture with some detrital material