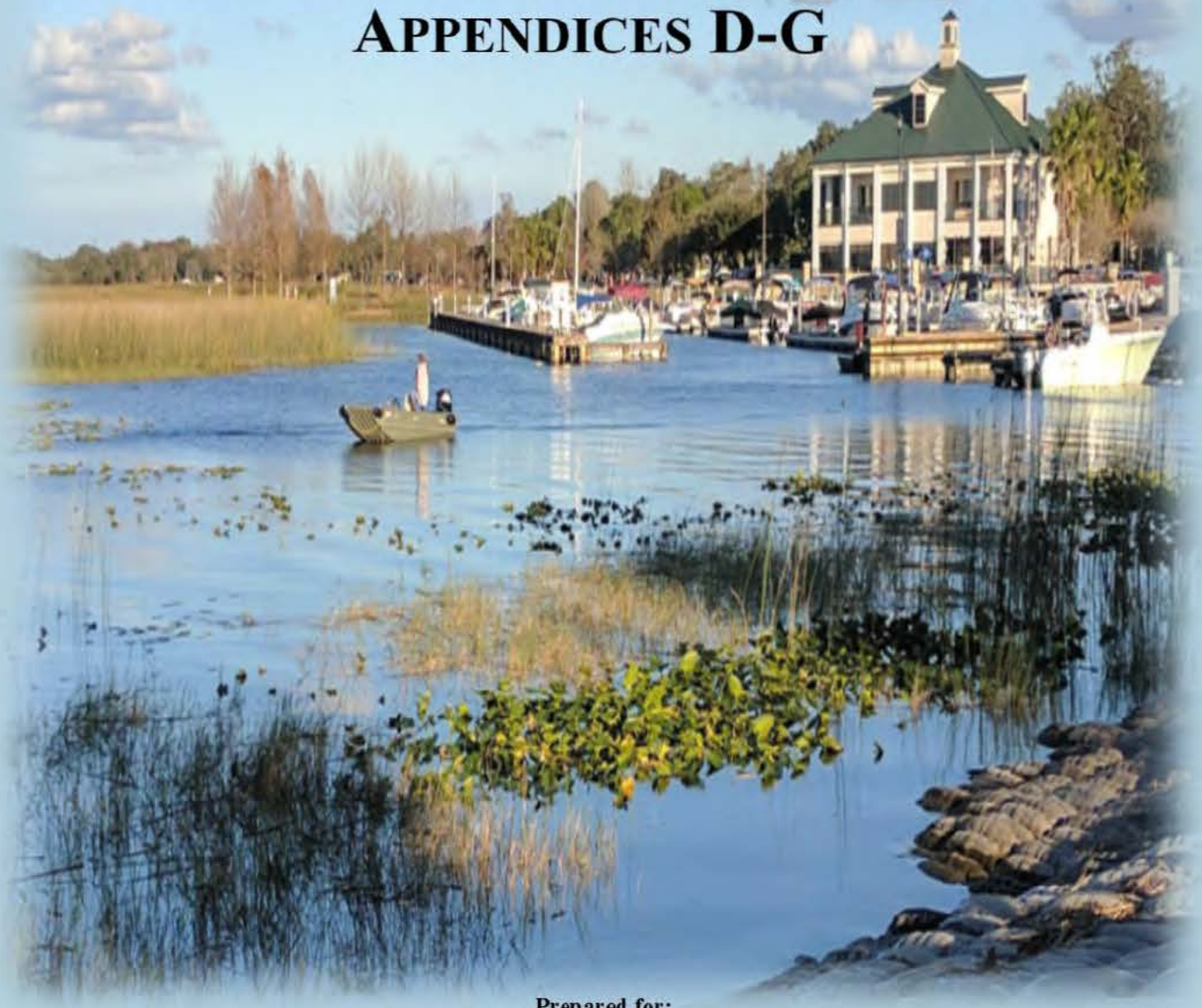
US Army Corps of Engineers

East Lake Tohopekaliga Drawdown and Habitat Enhancement Draft Environmental Impact Statement

APPENDICES D-G



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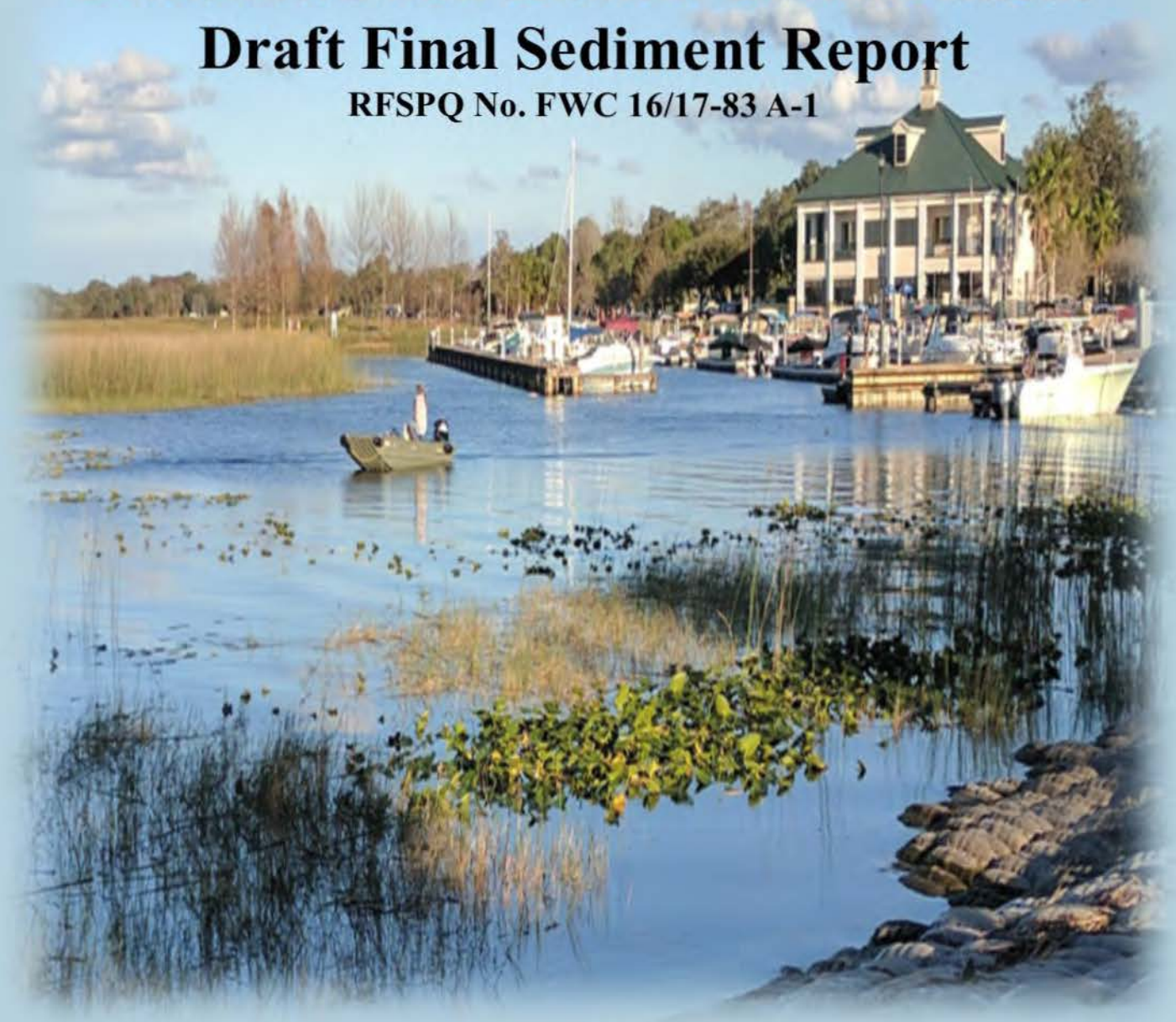
Appendix D
Sediment Analysis Report

East Lake Tohopekaliga Drawdown and Habitat Enhancement Draft Final Sediment Report

RFSPQ No. FWC 16/17-83 A-1



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Florida Fish and Wildlife Commission
St. Cloud, Florida

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November 2018

East Lake Tohopekaliga Drawdown and Habitat Enhancement

Draft Final Sediment Report

RFSOQ No. FWC 16/17-83 A-1

Prepared for:

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St. Cloud, Florida

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November 2018

ABSTRACT

Sediments and vegetation were characterized at approximately 300 points along 17 transects within the littoral zone of East Lake Tohopekaliga (East Lake Toho), with approximately 50 sample points in Fells Cove and Lake Runnymede. The characterization study generally confirmed a hypothesis that vegetation cover and community type can be used to predict the locations of the littoral zone with the deepest organic matter deposits. Locations that contained shrubs (usually wax myrtle [*Myrica cerifera*] and willow [*Salix caroliniana*]) and in some cases trees (maple [*Acer rubrum*] and willow) had the thickest organic matter deposits. The deeper water edge of the transects usually contained bulrush (*Scirpus*) and in some cases maidencane (*Panicum hemitomon*) and/or torpedo grass (*Panicum repens*). These areas contained the least amount of organic sediment or muck. Core samples were taken and indicated that most of the benthic organic matter was composed of live roots in areas where bulrush was the primary cover type. The water column above the roots generally had a narrow band of flocculent organic matter. Cattail (*Typha spp.*) was one of the dominant cover types sampled and was generally found just shoreward of bulrush and in many cases the two are found together. Cattail generally contained little sediment or muck but often contained thick root mats and large rhizomes, plus leafy detritus. In some cases, cattail roots were associated with loose organic muck (generally settled flocculent organic matter) and is likely related to the decreased wave action landward of the bulrush. Additionally, at many locations cattail was associated with bladderwort (*Utricularia sp*) and yellow water-lily (*Nuphar advena*) and American white water-lily (*Nymphaea odorata*) which tended to increase the amount of organic matter present.

In addition to the significant organic sediments associated with locations containing shrubs and trees, tussock habitat often contained thick organic deposits. It was anticipated that tussocks would contain muck associated with the roots of the primary cover types; however, the tussocks frequently were composed of primarily fine roots and rhizome with very little associated muck. This was also true regarding floating tussocks with low vegetation cover. Tussocks frequently are associated with pickerel weeds (*Pontedaria cordata*) and are frequently covered with shrubs and in some cases tender aquatic plants (*Nymphaea*). Some tussocks contained an abundance of the orchid (*Habenaria* sp).

Tussocks were differentiated from islands in the project area. Tussocks generally float or have a significant water layer between the bottom of the tussock and the benthos. Tussocks are composed predominantly of live root matter and contain herbaceous species. Islands are more stable than tussocks (tend to have more woody species) and contain organics (often peat) from the surface to the sand layer. In some cases, there is a layer of water or loose muck between the bottom of the peat and the sand.

The data collected for the sediment evaluation helped formulate a new alternative for the East Lake Tohopekaliga Drawdown and Habitat Enhancement Project (Project) that could maximize habitat benefits, while at the same time minimizing both environmental and water quality impacts and project costs. This alternative would preserve a limited number of islands within the proposed scrape zone protecting habitat (for birds, amphibians and reptiles) and ecosystem function while at the same time achieving the original project goals and objectives.

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INTRODUCTION

The Florida Fish and Wildlife Conservation Commission (FWC) determined that a large portion of the eastern shoreline of East Lake Tohopekaliga (East Lake Toho) is affected by a combination of in-lake organic sediments and associated emergent vegetation. The combination is thought undesirable due to reduced fish breeding habitat, increased biological oxygen demand (BOD) and creation of a near-shore zone that has become partially cut off from the main body of East Lake Toho. The FWC proposed to alleviate this situation by lowering the lake stage to dry out and compact the organic sediments and to then deposit the sediments either at an off-lake site location or by creating one or more within-lake spoil islands. The proposed action requires an Environmental Impact Statement (EIS). Diverse information, including recent public comments, recent interagency comments and a review of available data, suggested the need for current field measurements to support such an EIS. In particular, current field data was needed to answer the following questions:

1. What remedial treatments are available? (These might include scraping, dry down and burning, or *in situ* oxidation of organic material, or other alternative treatments.)
2. Where within East Lake Toho are the various treatments needed, that is, which parts of the shoreline?
3. If muck is to be scraped and transported, approximately what volume and weight can be expected?
4. If the scraped material were to be used to create an in-lake island(s), what are the initial dimensions of the island(s) likely to be?
5. What levels of nutrients and/or contaminants may be present in any scraped materials?
6. Are high concentrations of nutrients likely to seep from the spoil material into the surrounding lake waters?
7. How should two adjoining and hydrologically connected water bodies, Fells Cove and Lake Runnymede, be treated?

Point sampling and sampling along transects were compared with recent aquatic vegetation maps to estimate the quantity and distribution of organic sediments present in the littoral zone of East Lake Toho. Efforts focused primarily on the eastern shoreline (the location of the currently recommended project alternative) but the western and northern portions of the littoral zone were also sampled for comparison, including the northwest corner of the lake near Hilliard Island. To partially capture temporal changes, a number of locations from a previous study of East Lake Toho organic sediments were resampled (Sawka 2008).

The fieldwork included (a) soundings of several different types to determine thicknesses of organic sediments; (b) *in situ* soil corings to extract a fixed volume cylindrical sediment sample for laboratory analysis; and (c) field observations of vegetation. The soil cores were analyzed for physical properties (bulk density and volume change from drying,) and for chemical properties (nutrient and contaminant concentrations). The physical properties were needed to plan logistics of organic sediment removal and potential construction of in-lake islands while the chemical properties were needed to understand the potential for nutrient loading or contaminant leaching from the piled organic sediments, whether from in-lake islands or land surface disposal mounds.

Additionally, thicknesses of organic sediments in two water bodies hydrologically connected to East Lake Toho, Fells Cove and Lake Runnymede, were measured by sounding. Both water bodies were suspected of containing thick deposits of organic material. These thick organic deposits were thought to pose a possible risk of floating loose on post-drawdown refilling of East Lake Toho.

Listed below are the definitions of several terms that will be used throughout this report.

1. ***Peat*** refers to organic sediments that are fibrous, cohesive and included more than live roots.
2. ***Muck*** refers to organic sediments that were amorphous (lacking in structure), and non-cohesive.

In terms of habitats, that is, assemblages of plants and associated sediments, tussocks were distinguished from islands. Both tussocks and islands, as defined in this report, include organic substrate that is at or above the water surface and has a presence of emergent vegetation (occasionally missing from newer tussocks). Islands have much taller vegetation (2 meters [m] to 6 m or even 10 m) that is predominantly woody and the species are different. Island vegetation was mostly wax myrtle *(Myrica cerifera*[1]), coastal plain willow (*Salix caroliniana*), and red maple (*Acer rubrum*) with an understory of numerous ferns, often moss, *Hypericum virginiana* (native) and sometimes elephant ears (*Colacasia esculenta*) (non-native). Additionally, the peat base of the islands generally appeared to rest directly on (or in some spots slightly above) the underlying sand, while the organic sediments under tussocks were generally floating and dominated more by root mats. Tussock vegetation was lower in height (0.5m to 1.5 m) and more herbaceous. The upper surface of the island peat is often well above the water surface. Roots of the island vegetation appeared to extend into the sand below the peat. The height of the islands and their orientation (parallel to the shoreline) has led to the islands being referred to as berms.

While it was beyond the scope of this study, it is noted that what appeared to be a successional pattern of organic substrate habitats, beginning with mats of dense fine roots of American white water-lily (*Nymphaea odorata*) or yellow water lily (*Nuphar lutea*) often entrapped a degree of organic sediments (muck). (It may be that this same succession can initiate with cattail [*Typha*] roots as well.) Portions of these root mats appeared to occasionally float to the water surface. The floating mats then appeared to become colonized by species that prefer the floating (and/or surface) environment, particularly pickerel weeds (*Pontedaria cordata*), but sometimes further growth of lilies. It appears likely that at least some tussocks transition into islands as they become colonized by larger and heavier woody species. Roots of the woody island vegetation appear to eventually anchor into the underlying sand (perhaps associated with seasonal decreases in water depth). The impression of vertical anchoring in the underlying sand is based on the South Florida Engineering and Consulting, LLC (SFEC) field team's attempts to displace the woody vegetation vertically; the SFEC field team was not able to do this. Peat accumulation appears to continue and possibly accelerate, because the peat encountered on the islands often extended from the underlying sand to well above the water surface.

[1] *Myrica cerifera* is currently referred to as *Morella cerifera* however *Myrica* is used throughout this document because it is widespread in the literature.

METHODS

Locations

Most sampling was concentrated within the littoral zone of East Lake Toho, Florida, with additional sampling conducted in two connecting water bodies, Fells Cove and Lake Runnymede.

The most intensive sampling efforts were focused on the areas proposed for sediment scraping by the FWC. The proposed area runs approximately north-south and parallel to the eastern shore of East Lake Toho (Figure 1). The area includes 113 acres and was delineated on the basis of vegetation and expected sediments and is located primarily between the 55 feet and 53 feet North Geodetic Vertical Datum 1929 (NGVD29) lake bottom elevations. The area is approximately 14,000-feet long, averages approximately 430-feet wide, and includes a variety of herbaceous, open-water, floating and woody vegetation types. The sampling design chosen reflects a balance between the study's primary goal (estimating the quantity of sediments) and the time and effort of physically getting to the sample points. The sampling design was also influenced by an assumption that the physical characteristics of the organic sediments relevant to scraping, transporting and stockpiling the organic sediments, namely the bulk density and loss of volume on drying, would not vary greatly within a vegetation type.

Source: SFEC 2018

Note: Transects are noted with on red lines with labels; primary proposed scrape area is noted by black polygon.

FIGURE 1 LOCATIONS OF SEDIMENT CHARACTERIZATION TRANSECTS WITHIN THE PRIMARY PROPOSED SCRAPE AREA

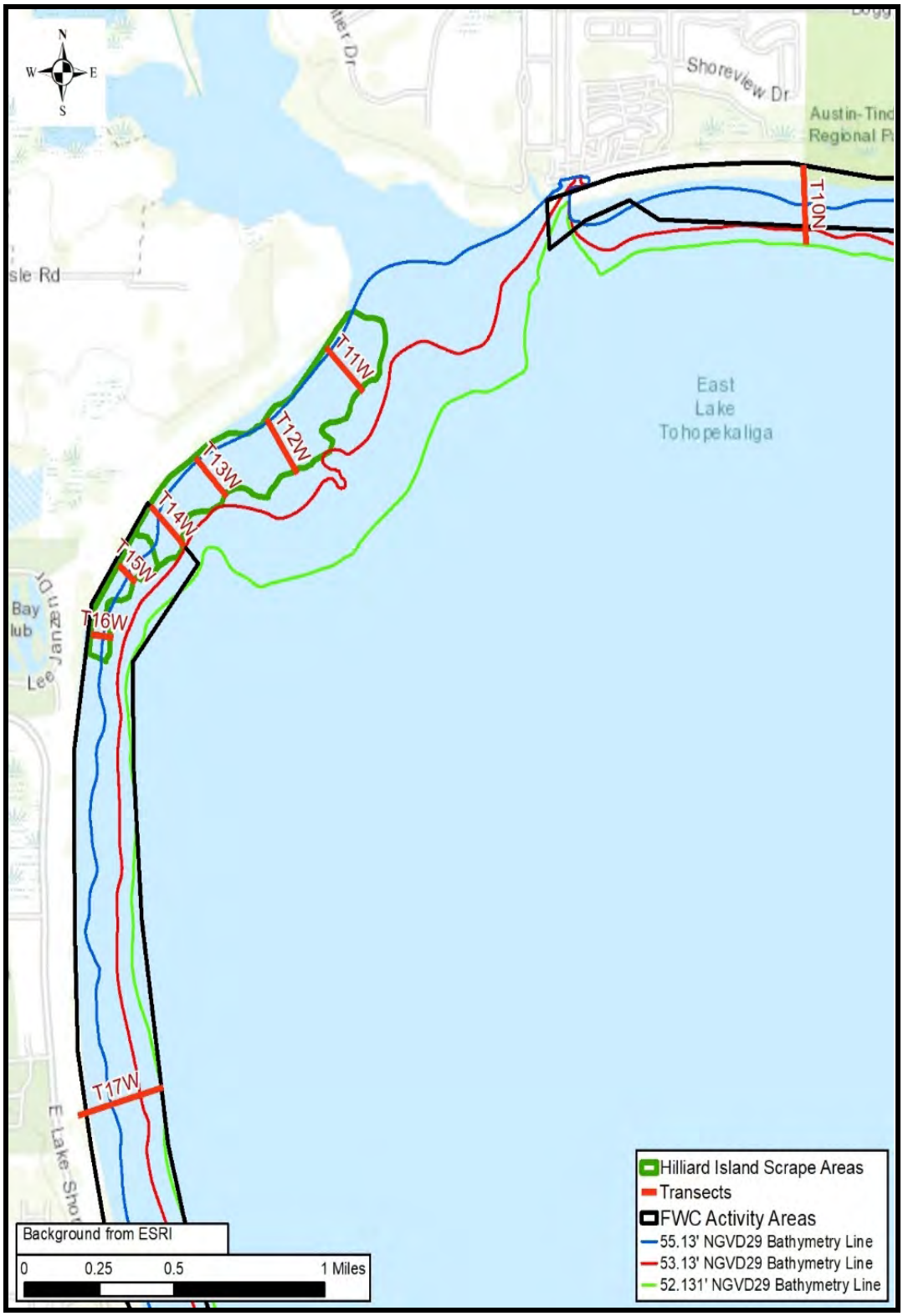
Based upon inspection of a vegetation map (URS 2016) and aerial imagery, that included consideration of the locations of dredged access channels leading to private docks, nine transects were positioned to perpendicularly traverse the scrape area, resulting in roughly 1500 feet between transects (Figure 1). A sampling distance of approximately 50 feet was set along each transect resulting in an average of approximately nine sample points per transect. Transects of the sample points were stored in a field global positioning system (GPS) unit and were specifically chosen to cross the slightly elevated islands of woody vegetation present along many portions of the eastern littoral zone. Where the 50-foot spacing appeared to produce too few replicate points within these islands, the sample density was increased to better estimate the volume of berm-associated organic sediments. Similarly, additional points were collected in the transition zones between habitat types.

FWC provided airboat navigation to the lakeward end of each transect and where possible, to accessible sample points within each transect. The majority of each transect however, was traversed by SFEC field team on foot due to the presence of dense cattail stands, elevated tussocks of pickerel weed and wax myrtle, or the islands of woody vegetation. Sometimes the organic sediments were sufficiently robust to support the weight of the team members, but frequently one or both feet would sink through the sediments to the underlying lake bottom (Figure 2). The SFEC field team attempted to reach all GPS sample points but sometimes field conditions required slight adjustments in position. Coordinates of all actually sampled points were recorded by GPS (Garmin Model GPSMAP64ST).

FIGURE 2 WALKING IN (LEFT) AND ON (RIGHT) ORGANIC SEDIMENTS

Six transects of similar spacing and the same point sample density were used to characterize organic sediments in the littoral zone adjacent to Hilliard Island, which was initially considered as a second possible scrape and land deposition site (Figure 3).

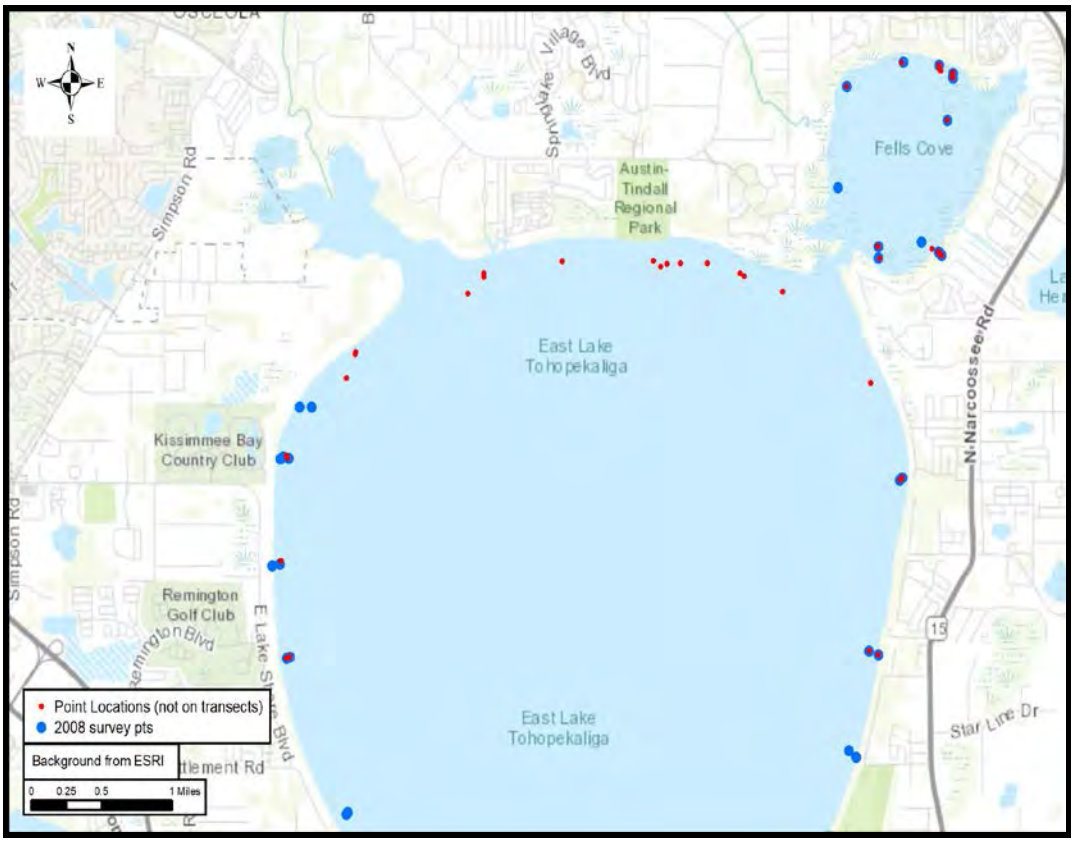
Two additional transects (Figure 3) were included from littoral zone areas that were not proposed for scraping, allowing for comparison of the sediment thicknesses with the proposed eastern scrape area. This comparison was supplemented with a number of individual sample points from the northern and western littoral zones (Figure 4).



Source: SFEC 2018

Note: Transects are noted with on red lines with labels

FIGURE 3 LOCATIONS OF SEDIMENT CHARACTERIZATION TRANSECTS ON EAST LAKE TOHO WEST AND NORTHWEST SIDES



Source: SFEC 2018
Note: red = Study 2018; blue = Sawka 2008

FIGURE 4 LOCATIONS OF POINT SAMPLES

Sawka (2008) measured thicknesses of organic sediments in and near East Lake Toho; unfortunately, the 2008 study did not provide coordinates for the sample locations. Therefore, for this study, the sample locations were estimated by georectifying images included in the 2008 study. Many of these points were resampled with the goal of estimating temporal changes in organic sediment thicknesses for the 2008 to 2018 decade.

To characterize organic sediments in the two smaller water bodies connected to East Lake Toho, Fell's Cove and Lake Runnymede, two additional transects were added; both transects were sampled from the airboat. Additionally, individual points near the shoreline of Fell's Cove that were sampled in 2008 were resampled during the field operation and added as part of this (Figure 4).

Point Sample Measurements

Vegetation and organic sediment characteristics were recorded at each sample location, regardless if it was an individual point sample or a point that was part of a transect. Vegetation within a 10-foot radius of the point was assigned to one of the vegetation classes used in the most recent East Lake Toho vegetation map (URS 2016). Canopy heights of shrubs, trees and

dense cattail stands were estimated. The presence of floating tussocks was noted along with their approximate thickness.

Organic Sediment Thicknesses

The thicknesses of organic sediments were determined by measurements of the elevations of the upper and lower surfaces of the sediment layer(s), relative to the water surface of East Lake Toho. (These elevations were later converted to absolute elevations, NGVD29, using the corresponding daily lake stage data from the headwater stage gauge at the S-59 structure, located between East Lake Toho and Lake Tohopekaliga.) Three tools were used, two sounding rods with different "feet," and an instrumented flocculent layer detector based on light beam interruption. The shafts of all three rods were marked in 1 centimeter (cm) intervals, measuring up from the bottom of the sounding rod foot or from the horizontal light beam.

The first sounding rod, consisting of 0.5-inch copper tubing, with a 0.5-inch copper endcap, was used to detect the sandy lake bottom. The rod was 200 cm long, with a threaded copper "T" at the upper end. A threaded extension was available, if needed. The small diameter of the sounding rod and foot, combined with the weight of the rod, made it easy to pass through any organic sediments present, including any root mats present. The rod was "thumped" energetically onto the bottom sediments to locate the sand layer. The metal foot facilitated detection of the sand surface, through firm resistance and a "crunchy" feel and sound. Soundings were repeated on bottom of East Lake Toho three times at each site.

The second sounding rod consisted of Schedule 40 0.5-inch polyvinyl chloride (PVC) pipe with a 2-inch diameter foot consisting of a flat 2-inch end plug, a 2-inch coupling, and a 0.5-inch to 2-inch adaptor. This foot provided both weight to the sounding rod and a large enough surface to sit relatively flush on the surface of fibrous organic sediments (peats). The PVC sounding rod was "thumped" onto the peat surface sufficiently firmly to detect and avoid water lily or tender aquatic plants rhizomes and/or to compress any loose fine root mats present.

Use of the PVC rod varied somewhat by position along the radial transects. At lakeward ends of the transects, where bulrush (*Scirpus*) or cattail predominated in relatively deep water, most of the water column was water and the PVC foot settled on the upper surface of a thin layer of benthic organic material, here often mostly roots rather than organic sediments. The thickness of this layer was calculated as the difference between the 2-inch PVC-foot elevation (top of layer) and the 0.5-inch copper-foot elevation (bottom of layer/top of sand). Soundings were repeated up to three times.

When a tussock (floating, cohesive organic sediment) was present, the top of the tussock was generally above the water surface. To measure this elevation, the PVC foot was vigorously thumped to indent the peat until water was reached. After allowing the water level in the indentation to equilibrate, the distance was measured upward from the water to the top of the tussock. To measure the elevation of the bottom surface of the floating tussock, a hole was punched through the tussock with the PVC foot, hooked the upper edge of the PVC foot on the lower surface of the tussock and took a reading, subtracting 10 cm (thickness of the PVC foot) from the read value. Through this same hole, the elevation of the lake bottom was measured

using the copper rod, and the elevation of the surface of any benthic sediments present were measured the PVC foot. Triplicate readings were usually but not always taken with this methodology due to the more substantial time involved.

A third sounding rod (Figure 5), based on light beam interruption, was used to measure the elevation of the surface of unconsolidated flocculent organic sediments present at the bottom of the water column. The rod was raised and lowered while listening for interruption by the flocculent material; a surface elevation was then taken. This custom-made sounding rod worked successfully when locations could be found where other, non-flocculent beam interrupters such as bladderwort (*Utricularia*) or other plant stems were absent. In practice, after initial testing, few additional readings of flocculent material were minimal, either due to the presence of interference or because visual inspection suggested that little or no flocculent material was present.

Source: SFEC 2018

FIGURE 5 FLOC DETECTOR SOUNDING ROD SHOWING LIGHT SOURCE (LEFT) AND LIGHT SENSOR (RIGHT)

Sediment Chemistry – Contaminant and Nutrient Concentrations

Thirty-three soil samples were collected for chemical analysis at locations along nine transects (Figure 6), primarily from the main proposed scrape area (eastern littoral zone) and a possible second scrape area (Hilliard Island area). Within each transect, locations were chosen to capture a positional gradient from lakeward to shoreward. The lakeward samples were taken in cattail, bulrush or lily pad (water lily and/or tender aquatic plants) communities; the mid-transect samples on tussocks of pickerel weed, with lily pads and often with shrubs and ferns, or on wooded islands with wax myrtle and coastal plain willow and abundant ferns; and the shoreward samples were taken in the freshwater marsh class (URS 2016) or lily pad class.

Source: SFEC 2018

FIGURE 6 LOCATIONS OF SOIL SAMPLES FOR CHEMICAL ANALYSIS

All samples were collected using a 2-inch diameter soil-coring device and then placed on ice. Due to limited amounts of material, some samples were composites of multiple cores. Samples were submitted to Advanced Environmental Laboratories, Inc. (AEL Labs) for both nutrient and contaminant analysis within required hold times. Nutrient analysis included total nitrogen and total phosphorus. Contaminant analysis included the parameters noted in Table 1. All analyses were conducted using standard methods (Appendix 3).

TABLE 1 CONTAMINANT ANALYSIS PARAMETERS

Aluminum	Fluoranthene
Antimony	Lead
Arsenic	Mercury
Beryllium	Nickel
Cadmium	Phenanthrene
Chromium	Zinc

Sediment Bulk Density Cores

Thirty-five sediment cores were collected to determine sediment bulk density and volume change during drying. The sample locations were chosen to capture the range of plant communities and their associated sediments present within the proposed eastern littoral zone scrape site. The undisturbed sediment cores were extracted using a 10-cm diameter stainless steel cylinder sharpened at the lower end, fitted with a crossbar at the upper end (Figure 7) (U.S. EPA 2008). The crossbar was used to rotate the cylinder back and forth while simultaneously pressing the cylinder downward. The sharpened edge was found to effectively cut both sediments and roots, reducing compaction of the sampled sediments. An adjustable plunger was created for use with the cylinder. Turning the extended plunger handle tightened or loosened the plunger against the cylinder wall, both physically locking the plunger in place and providing an airtight seal of the cylinder. When taking a sediment core, the plunger was loosened prior to rotating and pushing the cylinder downward. To extract the cylinder and sediment core, the plunger was positioned at the top of the soil, tightened to seal, and the crossbar was used to pull the cylinder upward. The suction created by the plunger helped keep the sediment core in the cylinder. The cores were extruded into 12-cm-long plastic cylinders, the sediments cut flush at both ends, and then capped at both ends (Figure 8 and 9). After uncapping, the sediment cores were allowed to air dry (Figure 10). During the course of drying, on days 2, 15, and 49, the approximate core diameter and height were estimated, and the cores weighed.

FIGURE 7 SAMPLING CORES IN MIXED PICKEREL WEED-CATTAIL TUSSOCK (LEFT) AND IN A LILY (*NYMPHAE*) DOMINATED MARSH (RIGHT)

FIGURE 8 EXTRUDED CORES SAMPLES FROM A WAX MYRTLE ISLAND

FIGURE 9 EXTRUDED CORE SAMPLE FROM A LILY DOMINATED MARSH
(Capped on bottom only)

FIGURE 10 SAMPLE SOIL CORES DRYING

Sediment Leachate Study

At a subset of the locations where bulk density samples were collected, soil core samples were also taken to evaluate the potential for nutrient leakage/flux upon rewetting of partially air dried soils. Soil samples were decanted and then allowed to air dry for 14 days. At that point, the soil samples were split into two subsamples. The first soil subsample (approximately 100-grams wet weight) was added to 1 liter of local rainwater. After 48 hours of equilibration, the water surrounding the soil was bottled for chemical analysis. Samples were collected in bottles provided by AEL Lab (pre-cleaned and acidified per standard methods). Orthophosphate and nitrate samples were filtered prior to shipment. The subsamples were shipped on ice to AEL Lab within 24 hours of collection and were analyzed for total Kjeldahl nitrogen (TKN), total phosphorus, orthophosphate and nitrate. All water samples were analyzed within 48 hours of collection (n=15+2 rainfall blanks). In parallel the set of second soil subsamples were used to determine moisture content of the 14-day air dried soil by weighing before and after placing into a drying oven at 105 degrees Centigrade (C).

RESULTS

Vegetation of the Proposed Eastern Scrape Area

The portion of the littoral zone of East Lake Toho identified in 2017 by FWC staff as the proposed scrape area for vegetation and organic sediment removal is located on the eastern shore of the lake (Figure 1). It includes approximately 113 acres that were mapped in 2016 as 17 different vegetation classes (URS 2016). A representative subset of the area is provided in Figure 11. The spatial coverage of these 17 vegetation classes within the proposed scrape area is provided in Table 2. The first eight vegetation classes include approximately 90% of the scrape area; the other eleven vegetation classes are all minor. Figure 11 suggests a varied and somewhat complicated vegetation pattern. Field observations of the transects, confirmed the vegetation generally revealed a zonation of four main groupings. From lakeward to shoreward these were: (1) a zone of tall emergent species; (2) a zone of tussocks; (3) an island zone (has also been called a "berm"); and (4) a zone of herbaceous marsh.

- Zone 1, tall emergents, included bulrush on the lakeward edge, with cattail, and yellow pond lily.
- Zone 2, tussocks, supported pickerel weeds, and fern species, sometimes the shrubs water primrose (*Ludwigia peruviana*) (non-native), large primrose (*Ludwigia grandiflora*) (non-native) or Mexican primrose (*Ludwigia octovalvis*) (native), often with some cattail.
- Zone 3, the islands, were covered with a dense stand of woody species, including some combination of wax myrtle, coastal plain willow and sometimes red maple, with an undergrowth of ferns, taro, some herbs, and mosses.
- Zone 4, herbaceous marsh, included a range of mixtures. One common mixture was American white lily with various bladderwort species, and sometimes included yellow pond lily. Another frequent mixture was pickerel weeds, sometimes with primrose, much like in Zone 2. Alternatively, a graminoid/herb marsh, featuring spike rush (*Eleocharis*) species with other sedges, grasses, pennywort (*Hydrocotyle*), and arrowhead (*Sagittaria*) might be observed. Scattered cattail was common in many of the mixtures. Zone 4 was also often dominated by invasive species, such as torpedo grass and Wright's nutrush (*Scleria lacustris*). Any open water within Zone 4 often contained extensive growth of bladderwort.

All four zones can have irregular boundary areas where characteristics of both zones blend together such that drawing a clear line of distinction can be difficult.

The elevated substrate on both tussocks (Zone 2) and islands (Zone 3) likely provides useful habitat for wading and non-wading birds, amphibians and reptiles. The field team observed that the shallow habitat in Zone 4 (herbaceous marsh) was frequently used by wading birds for foraging, as well as by sandhill cranes for nesting and foraging. The SFEC field team observed snail kites using tall emergents (Zone 1) and tussocks (Zone 2); as well as in Zone 4, south of the boat ramp at Chisholm Park.

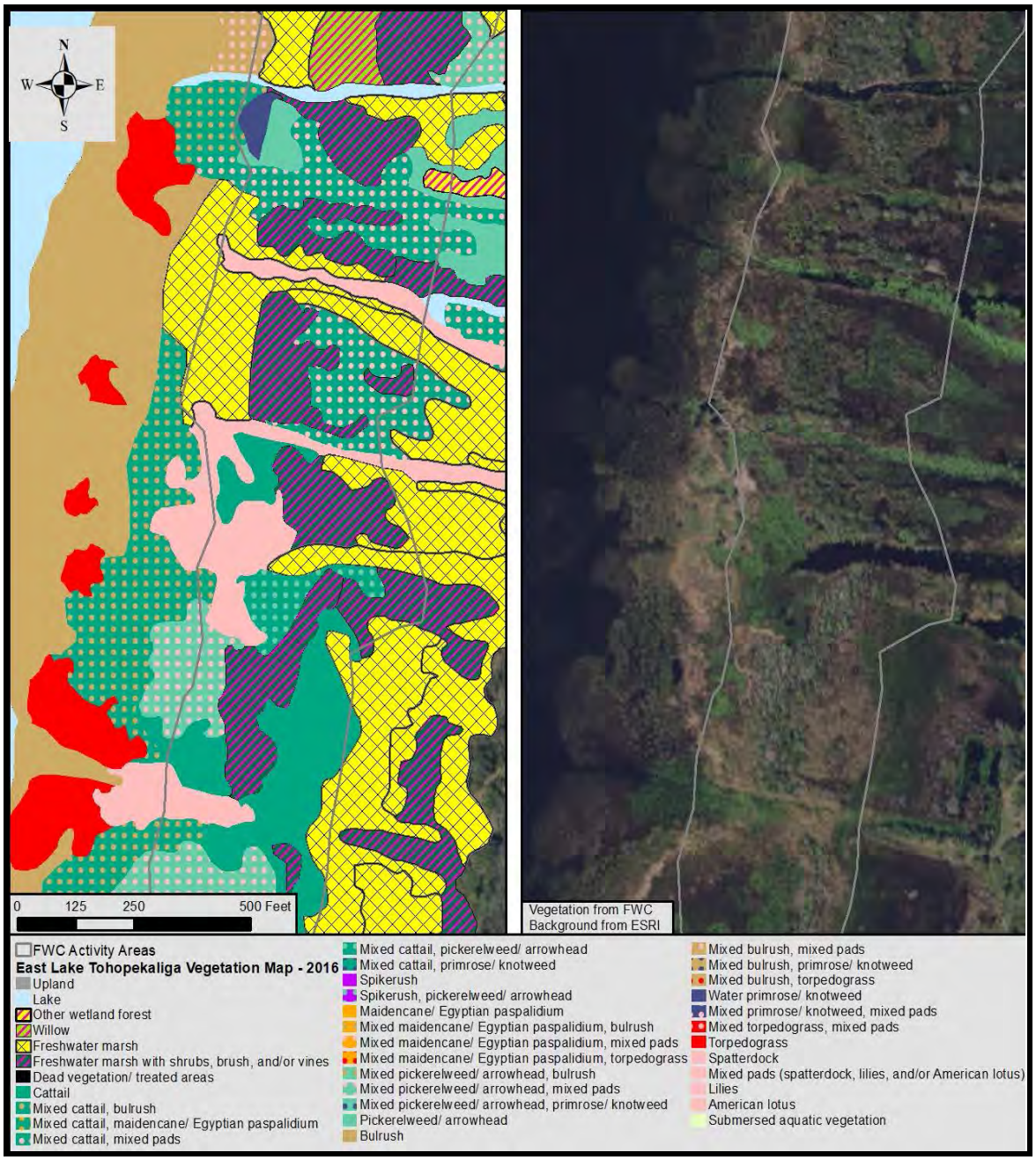


FIGURE 11 EXAMPLES OF VEGETATION THE PROPOSED SOUTHEASTERN SCRAPE AREA

TABLE 2 VEGETATION COVERAGE WITHIN PROPOSED SCRAPE AREA*

FLUCCS Code	Letter Code	Vegetation Class	% Cover
6417	MWS	Freshwater Marsh with shrubs, brush and or vines	19
6410	FWM	Freshwater March	18
6440	NN	Mixed Pads (Lilies)	16
6412-6440	TN	Cattail, Mixed Pads	10
6412	T	Cattail	8
6412-6420	TP	Cattail, Pickerelweed/Arrowhead	7
6181	W	Willow	6
6420-6440	PN	Pickerelweed/Arrowhead, Mixed Pads	5
5200	OW	Lake/open water	2
6412-6421	TSc	Cattail, bulrush	2
6450	SAV	Submerged Aquatic Vegetation	2
6420	P	Pickerelweed/Arrowhead	2
6442	Nu	Spadderdock	2
6420-6421	PSc	Pickerelweed/Arrowhead, Bulrush	1
6421-6440	ScN	Bulrush, Mixed Pads	1
6424	LP	Water primrose/Knotweed	0.3
6421	Sc	Bulrush	0.2
		Total	**100**

*Based upon URS 2016 coverage classifications.

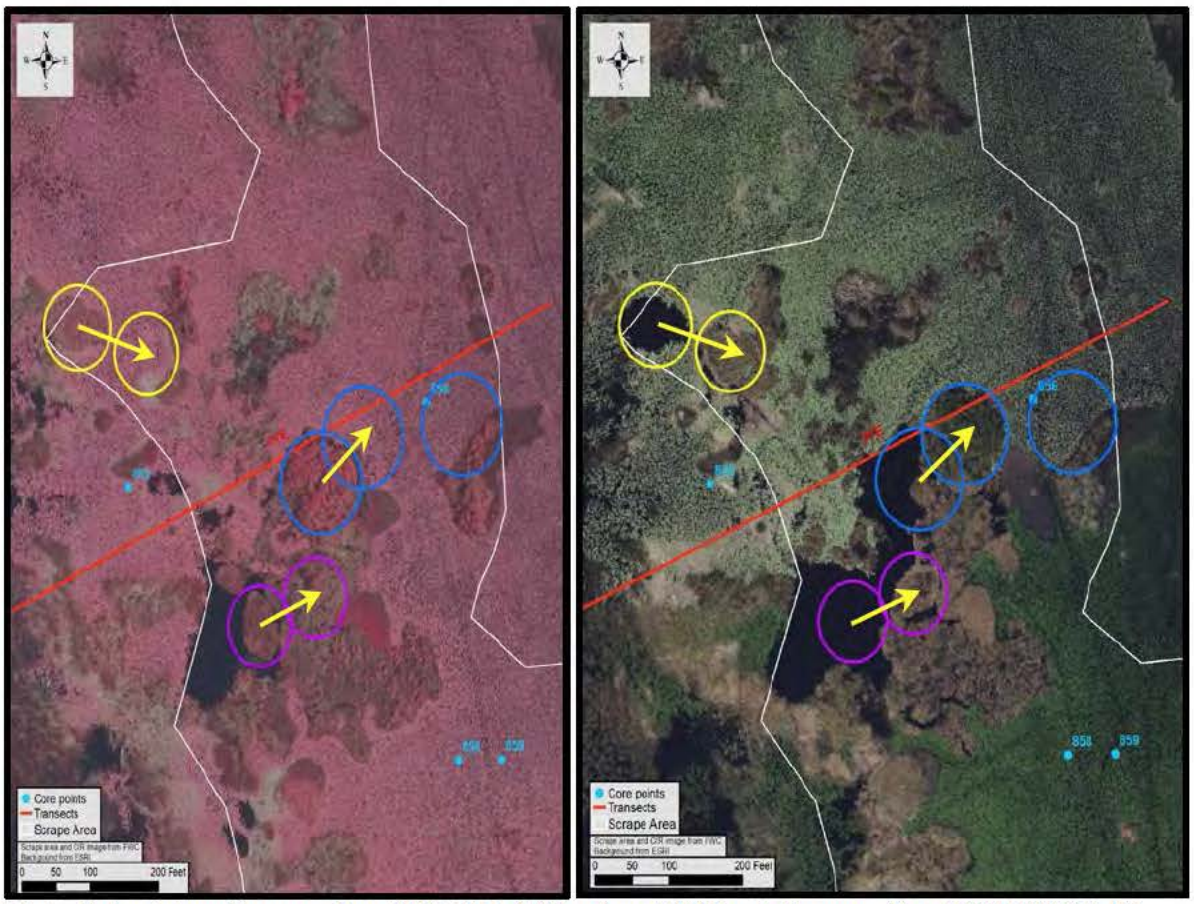
Table 3 provides the 17 vegetation classes, recognized by URS (2016), categorized into the four zones. This is necessarily only an approximate assignment, and one limited by the fact that several URS (2016) classes span two or more zones. For example, freshwater marsh was observed in both Zone 4 and Zone 2, and mixed cattail, pickerel weed/arrowhead were observed in Zone 1 and Zone 2, and occasionally in zone 4. Of particular note, the class of freshwater marsh with shrubs, brush, and/or vines blurs the distinction (clearly seen in the field) between tussocks and islands. The field team recommends that future mapping contracts be specified to make a clear distinction between tussocks, which have less substantial and more mixed shrubby vegetation, and islands, which have more woody vegetation that already are, or can become, taller trees. Due to lack of detailed information, all three overlapping URS (2016) classes were split 50% and 50% between the relevant zones (Table 3).

TABLE 3 VEGETATION CLASSES MAPPED INTO ZONES*

Zone	Vegetation Class	Cover %	Zone %
Zone 1 Tall Emergents	Bulrush	0	27
	Mixed bulrush, mixed pads	1	
	Mixed cattail, bulrush	2	
	Mixed pickerelweed/arrowhead, bulrush	1	
	Cattail	8	
	Mixed cattail, mixed pads	10	
	Spadderdock	2	
	Mixed cattail, pickerelweed/arrowhead (50%)	4	
Zone 2 Tussocks	Mixed cattail, pickerelweed/arrowhead (50%)	4	28
	Mixed pickerelweed/arrowhead, mixed pads	5	
	Pickerelweek/arrowhead	2	
	Water primrose/knotweed	0.2	
	Freshwater marsh (50%)	9	
	Freshwater marsh with shrubs, brush, and or vines (50%)	9	
Zone 3 Islands	Freshwater marsh with shrubs, brush, and or vines (50%)	9	15
	Willow	6	
Zone 4 Herbasceous Marsh	Freshwater marsh (50%)	9	25
	Lilies	16	

*Note: Based upon URS 2016 vegetation classifications.

The vegetation description and GPS coordinates that were recorded at each point along nine transects in the proposed eastern shore scrape area provided an opportunity to spatially compare field observations with the vegetation map of the scrape area (URS 2016). Comparison of the URS 2016 vegetation map with the 108 transect sample points indicated that 45% of the samples locations had the same vegetation; 28% partially matched; and 20% did not match. Most of the non-matching points were concentrated along Transects 1 and 9. Examination of aerial imagery of the area surrounding Transect 1 for two points in time, somewhat before 2016 and somewhat after 2016, suggests that certain portions of the wetland landscape, likely vegetated floating mats (tussocks), had in fact moved (Figure 12). These and any other similar displacements likely contributed to the differences between field observations and the URS (2016) vegetation map. It was noted that all three displacements moved shoreward, suggesting that the movement may have been the result of increased, or rapidly increased, water levels followed by an eastward blowing storm. Figure 13 provides an example of a large, apparently newer tussock (floating mat) in the vicinity of Transect 1.



Note: Color infrared imagery from URS 2016 (left) and post-2016 aerial imagery from ESRI 2018 (right).

FIGURE 12 EASTWARD DISPLACEMENT OF PROBABLE FLOATING VEGETATION

FIGURE 13 VIEW OF TRANSITION BETWEEN A RECENTLY RELEASED TUSSOCK (FOREGROUND) AND AN AREA WHERE THE ROOT MAT IS STILL SUBMERGED (BACKGROUND)

The second area of difference between field observations and those from the URS (2016) mapping occurred in Transect 9. The portion of Transect 9 with the most differences was mapped primarily as freshwater marsh, a more generic category. Within this portion of the transect, the SFEC field team mapped transect points to specific species (water lily, pickerel weed, and some bulrush), leading to the discrepancy with the URS Study (2016). It is possible that these species were not as developed or recognizable in the remote sensing at the time of the URS (2016) mapping.

Overall, the SFEC field team concluded that the URS (2016) vegetation map provided an acceptable basis from which to extrapolate the point-based sediment information gathered in this study.

Organic Sediments of the Proposed Eastern Scrape Area

Qualitatively, each of the vegetation zones described above tended to be associated with a different type of organic sediment. Figure 14 visualizes one example of the spatial distribution of these zones and associated sediments based on measured organic sediment depths and thicknesses. The cross-section provides elevations of the sand bottom of East Lake Toho, the water surface on the day of sampling, and the upper and lower surfaces of any organic sediments that were present. The transitions in organic sediment configurations between zones were in generally sharper than suggested in the cross-section. The long, broad transitions shown are because the point sample density was too low to accurately capture the shapes of the transitions. In some cases, organic layers between sample points may not actually be connected physically but are depicted that way to improve visualization and are at best approximations based on the density of sample points collected. For instance, in Figure 14, it is unclear if the benthic organic layer in Zone 1 is actually connected to the tussock organic layer in Zone 2

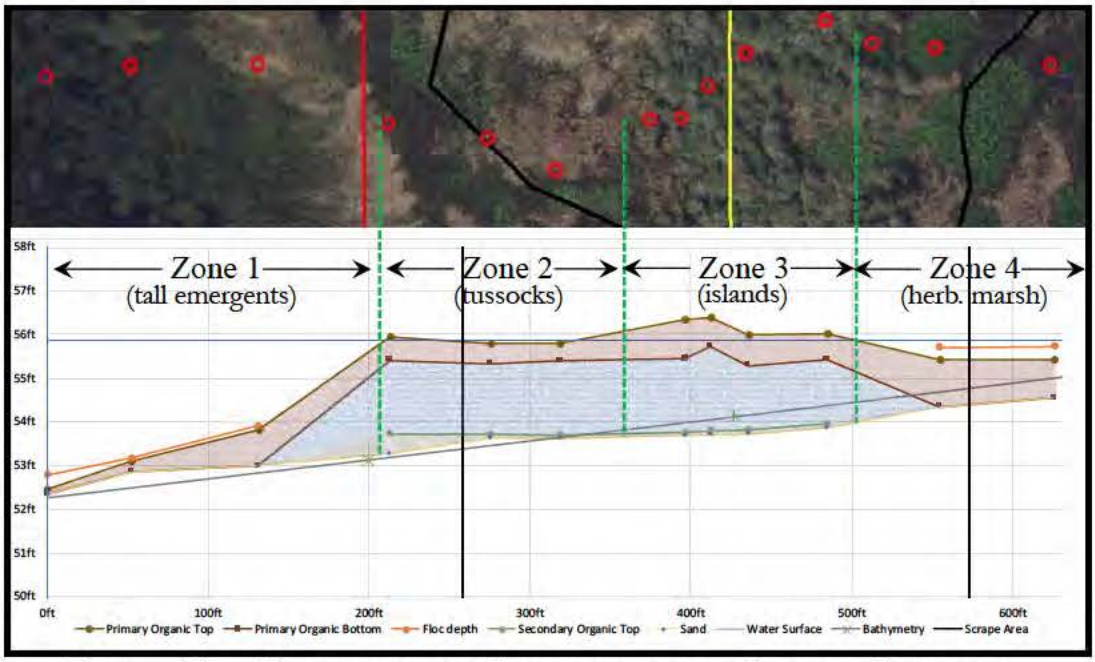


FIGURE 14 ESTIMATION OF CROSS-SECTION OF ORGANIC SEDIMENTS ALONG TRANSECT 5E (BOTTOM) WITH TRANSECT POINTS SHOWN ON AN AERIAL PHOTOGRAPH OF SAME SCALE (TOP)

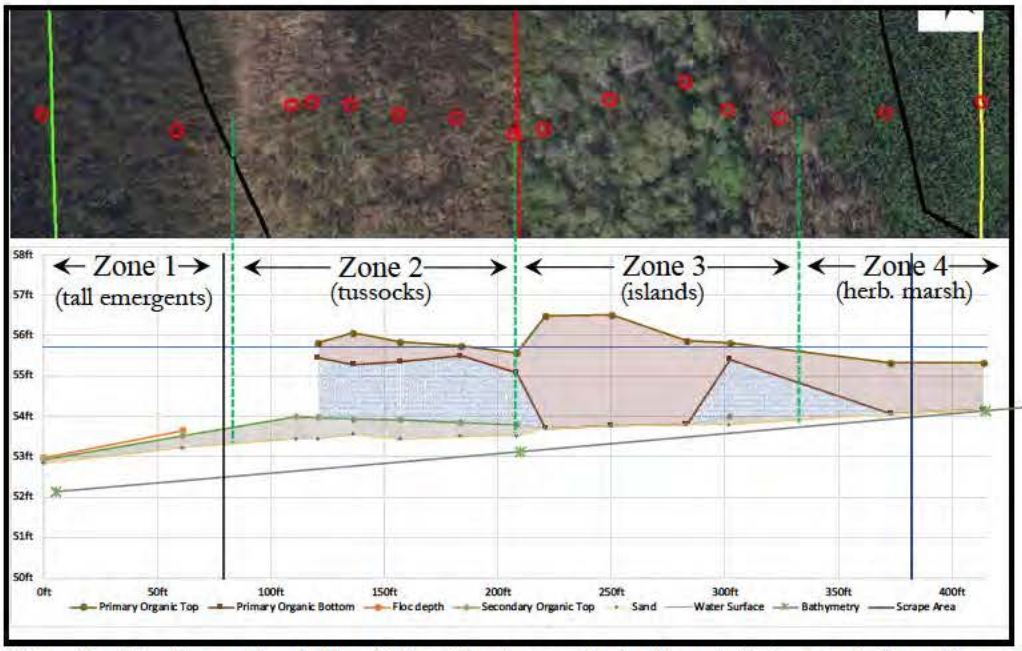
Generally organic sediments in Zone 1 and in Zone 4 are at the bottom of the water column, while the sediments of Zones 2 and 3 (tussocks and islands) are floating at the surface of the water column. This configuration was noted in many transects, however the island configuration varied, as noted below.

The lakeward zone of tall emergent species (Zone 1) had the least sediments and were primarily roots attached to the sandy lake bottom. Bulrush stands tended to have very little organic sediment other than the roots. Cattail stands had slightly more organic sediments; associated with the roots that attached to the sand and consisted mostly of recognizable fragments of cattail leaves and stalks (see photo in Figure 21).

Tussocks (Zone 2) were quite different. The sediments formed a cohesive floating mat of roots (primarily) and peat, generally floating just under or at the water surface. This mat was composed of fairly dense but low stands of vegetation. In some cases the mat was cohesive and buoyant enough to support a person standing on it; in other cases one or both feet would go through the mat and down to the underlying lake bottom. In all cases, the floating root mat was vertically un-anchored; it could easily be moved up or down in the water column. A distinct layer of water, or water with highly unconsolidated organic sediments, was present beneath the tussocks. Although not measured, it seems likely that DO concentrations in the water under the tussock layer were very low with high BOD (due to high organic content of the mats and minimal light penetration). This has been observed in pickerel weed and other dense vegetation stands (Bunch 2008). Because at least the edges of the tussock areas are likely in hydrologic contact with the lake, the high BOD may have some negative effects on adjacent

fish populations. Tussocks occupied approximately 14 acres, or 12% of the proposed scrape area.

Islands (Zone 3) differed from the tussocks, both in vegetation and organic sediments. Roots were present in the organic substrate of the islands but there also appeared to be a greater proportion of non-root organic matter (i.e., peat). The peat was reddish in color rather than blackish, suggesting less oxidation and decomposition of this material. The peat on the islands was sturdy, extending 4 inches to 10 inches above the water surface, and supported the field team's weight when walking on it. This sturdiness is somewhat unexpected, given the similarity in sediment cross-section to the much less solid tussocks (Figure 14). The organic sediments cross-section provided in Figure 14, as well as six other similar cross-sections provided in Appendix 1, indicate that a layer of water exists between the peat layer at the surface of the water column and the sand forming the bottom of the water column, thereby seemingly a contradiction to the field team observations of standing on the island peat. The field team hypothesized that the observed structural solidity is because of the presence of substantial trees (red maple*;* diameter at breast height [DBH] approximately 6 inches to 8inches) and tall shrubs (wax myrtle), DBH 3 inches to 5 inches and/or willow, coastal plain willow. Also hypothesized was that this larger woody vegetation stabilized the peat in two ways: (1) by developing a horizontal network of strongly intertwined small roots; and (2) by creating a system of vertical (tap)roots that anchor the peat to the sand bottom of East Lake Toho. The field team observed that it was sometimes possible to cause the smaller tree trunks to sway from side to side by alternately pushing and pulling on them, but it was rarely possible to move the trunks up and down vertically, suggesting deep rooting into the sandy lake bottom. The water gap (Figure 14) may underestimate the degree of connection of the island vegetation, island peat and the underlying sand bottom. Two of the nine transects did not exhibit a water gap; the peat was continuous to the bottom of the water column (Figure 15). Geographic information system (GIS) analysis indicated that islands occupied approximately 23 acres, or approximately 20% of the proposed scrape area.



Note: In this figure the bulk of the island consisted of peat that extended continuously from above the water surface fully to the sand bottom.

FIGURE 15 ESTIMATION OF A CROSS-SECTION OF ORGANIC SEDIMENTS ALONG TRANSECT 8E (BOTTOM) WITH TRANSECT POINTS SHOWN ON AN AERIAL PHOTOGRAPH AT THE SAME SCALE (TOP)

The back zone (Zone 4), located between the islands and the shoreline, often had open water and water lilies (tender aquatic plants, sometimes water lilies) on the surface, with the organic sediments at the bottom of the water column. These sediments were often a mix of fibrous live fine roots and blackish, amorphous sediments, suggesting more frequent drying and more advanced oxidation.

Quantification of Wet Volume of the Organic Sediments of the Proposed Eastern Scrape Area

The URS (2016) vegetation map was used as the basis for estimating the total volume of organic sediments present within the 113 acres of the proposed scrape area. All 200+ point measurements of organic sediment thickness that were made within the littoral zone of East Lake Toho were used, whether inside the proposed eastern scrape zone or elsewhere around the lake. Observations of the vegetation at each sample point were used to assign the measured sediment thickness to one of the 17 classes of the URS (2016) vegetation map. All thickness measurements were averaged for each vegetation class. Table 4 provides the vegetative classes, ordered by their areal extent within the proposed eastern scrape area, and with associated estimates of organic sediment thickness by vegetation class. The wet volume (last column) is simply the product of the mean thickness and the area. (A separate calculation, using only the 115 sediment thicknesses measured within the eastern scrape area, yielded a somewhat larger wet volume of 93 acre-feet. However, it was determined that the using the full East Lake Toho dataset of sediment thicknesses provided a more robust estimate of the eastern scrape zone thickness and wet volume.)

TABLE 4 ORGANIC SEDIMENT THICKNESSES BY VEGETATION CLASS AND WET VOLUMES IN THE PROPOSED EASTERN SCRAPE AREA

Letter Code	Vegetation Class	Thickness			Area	Volume
		N	Mean	SD	(URS)	(Wet)
			(cm)	(cm)	(acres)	(acre-feet)
MWS	Freshwater Marsh with shrubs, brush, and or vines	40	34	18	20.9	23.1
FWM	Freshwater Marsh	16	27	7	20.3	17.7
NN	Mixed Pads (Lilies)	8	11	7	18.5	6.7
TN	Cattail, Mixed Pads	29	15	12	11.1	5.6
T	Cattail	42	18	13	9.2	5.5
TP	Cattail, Pickerelweed/Arrowhead	10	27	9	7.6	6.8
W	Willow	--	34[1]	--	6.8	7.5
PN	Pickerel/Arrowhead, Mixed Pad	--	15[2]	--	5.3	2.6
OW	Lake/open water	5	10	12	2.4	0.8
TSc	Cattail, Bulrush	10	15	11	2.1	1.1
SAV	Submerged Aquatic Vegetation		10[3]		1.9	0.7
P	Pickerelweed/Arrowhead	12	19	7	1.7	1.1
Nu	Spadderdock	14	17	8	1.7	0.9
PSc	Pickerelweed/Arrowhead, Bulrush	--	16[4]	--	1.3	0.7
ScN	Bulrush, Mixed Pads	10	15	10	1.3	0.6
LP	Water primrose/Knotweed	2	29	18	0.3	0.3
Sc	Bulrush	8	12	14	0.3	0.1
	Totals				**112.6**	**81.9**

*Note: Based upon URS 2016 vegetation classifications.

Notes:

[1]Thickness for W estimated as same as MWS

[2]Thickness for PN estimated as average of NN and P

[3]Thickness for SAV estimated as same as OW

[4]Thickness for PSc estimated as average of P and Sc

Figure 16 presents the thickness data shown in Table 4, sorted by thickness. The thicknesses vary by a little more than a factor of two, with the thinner sediments associated with the taller emergent, cattails and bulrush, or with various lilies. Thicker sediments are associated more with the tussock vegetation (pickerel weed and arrowhead) and the generally woodier island vegetation.

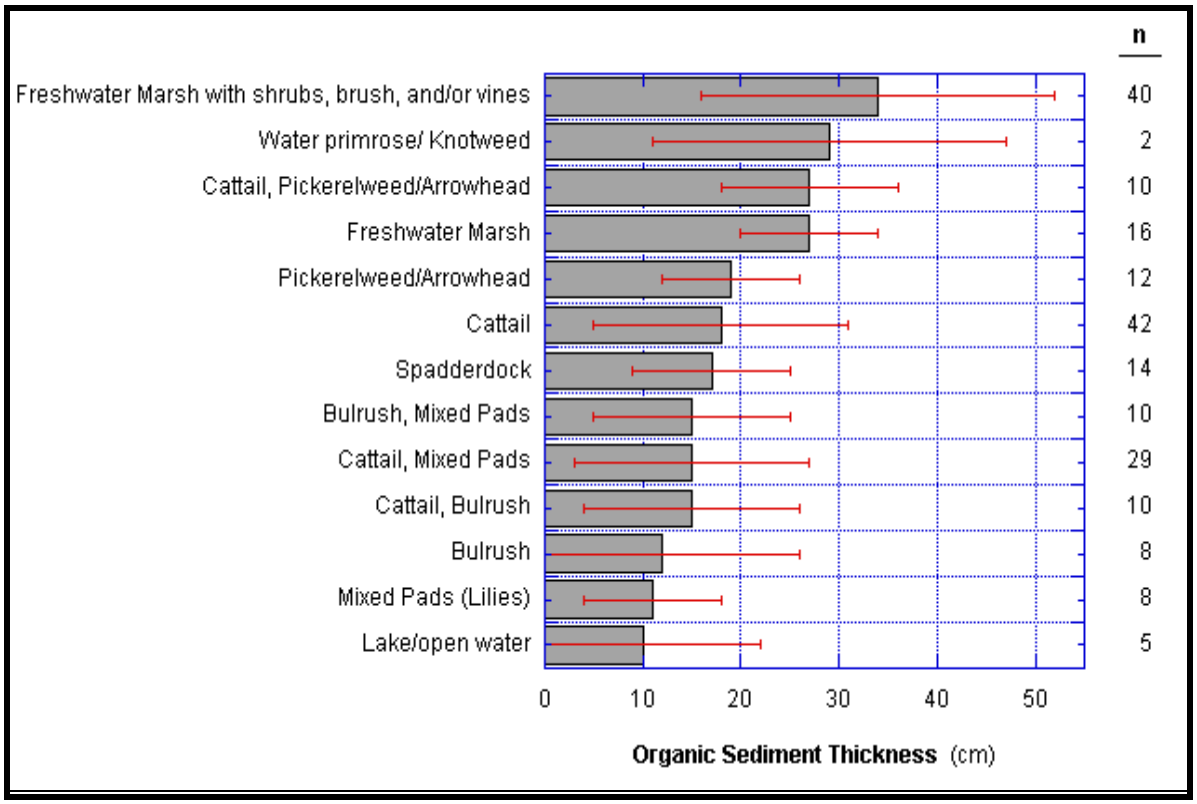


FIGURE 16 MEASURED THICKNESSES OF ORGANIC SEDIMENTS IN THE PROPOSED EASTERN SCRAPE AREA, BY VEGETATION CLASS, SHOWING 1 STANDARD DEVIATION AND NUMBER OF MEASUREMENTS ("N")

Bulk Densities, Wet Masses and Dry Masses of Organic Sediments of the Proposed Eastern Scrape Area

Thirty-five bulk density cores were taken across the various vegetation classes. Of these, two sediment cores were visibly contaminated with sand and were subsequently removed from the analysis. A histogram of the measured bulk densities (Figure 17) details that all of the bulk densities were very low, ranging from 0.04 to 0.14 grams per cubic centimeter (g/cm^{-3}), indicating that these sediments are primarily water, with very little solid material. As a working average the value of 0.09 g/cm^{-3}, or equivalently, 90 kg/m^{-3} was used.

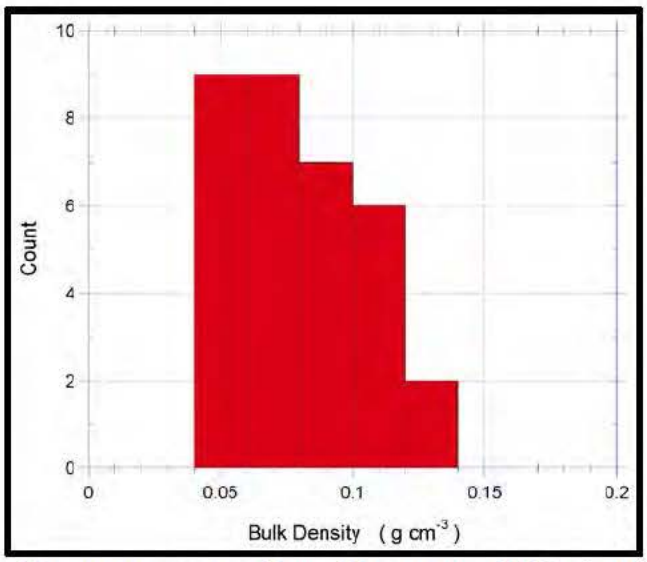


FIGURE 17 DISTRIBUTION OF BULK DENSITIES, 0.02 G/CM^{-3} INTERVALS, FOR THE ORGANIC SEDIMENTS OF THE PROPOSED EASTERN SCRAPE AREA

Total wet mass of the organic sediments of the proposed scrape area can therefore be estimated using the density of water. Thus for the total volume of 81.9 acre-feet (101,022 cubic meters [m^3]) shown in Table 4, the total wet mass would be (101,022 m^3) * (1000 kg/m^3) or approximately 101,000,000 kilograms (kg), 223,000,000 pounds (lbs) or 111,000 tons.

The *total dry mass* of the scrape area sediments is equal to the sediment volume times an average bulk density, 0.09 g/cm^{-3}, or (101,022 m^3) * (90 kg/m^3) = 9,090,000 kg, or approximately 10,000 tons. Note that this dry mass estimate is for the hypothetical case in which the sediments are fully air dry.

As the bulk density core samples dried, the organic material shrank substantially. Assuming a columnar shape, equivalent column diameters and column heights were visually estimated for the three measurement times, elapsed days 2, 15 and 49. These estimated volumes are of course more approximate than the measured weights, nevertheless they give a sense of shrinkage on drying. The air-dried volume, day 49, was 29 ± 13% of the original volume.

The estimated *total dry volume* of the proposed scrape area sediments is equal to the original wet sediment volume times 29%, 81.9 acre-feet * 0.29 or approximately 24 acre-feet.

Estimation of Rate of Drying of the Organic Sediments

During the course of drying bulk density soil samples from the proposed scrape area, intermediate measurements of the semi-dried sample weights were made. The sediment samples were air-dried, initially within impermeable cylinders with only the upper surface open to the air; later when the cylinders were removed, with the samples open to the air on the upper and side surfaces. The samples were fully air dry by the last measurement period (elapsed time = 49 days). Figure 17 provides the weights for the 49 days. It can be seen that the

variability decreases as the samples become fully dry. Figure 18 provides the estimated volumes of the drying organic sediment cores. The increase in variability over the 49 days is likely to at least in part be a reflection of the inaccuracies of estimating an equivalent cylinder diameter and height as the cores shrank into irregular shapes.

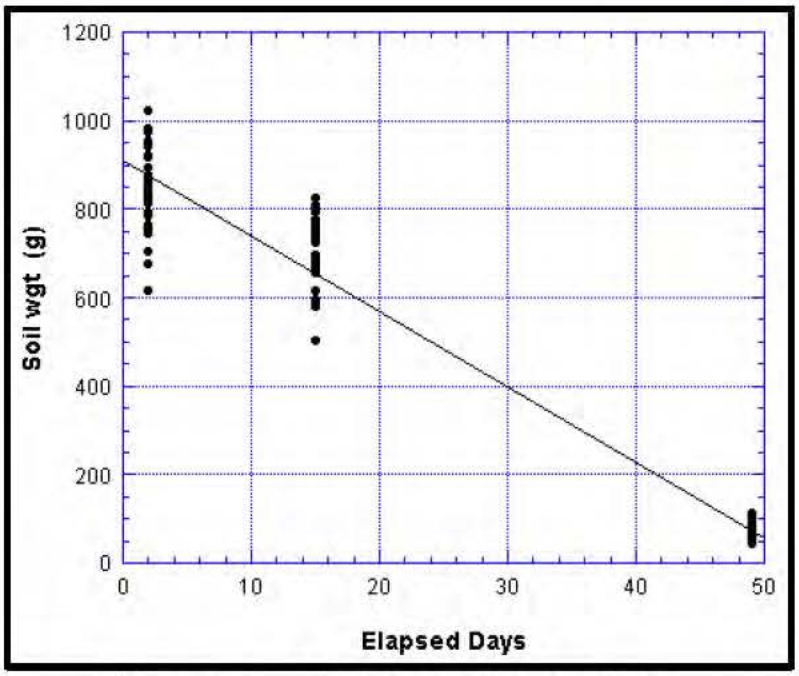


FIGURE 18 WEIGHTS OF DRYING CORES

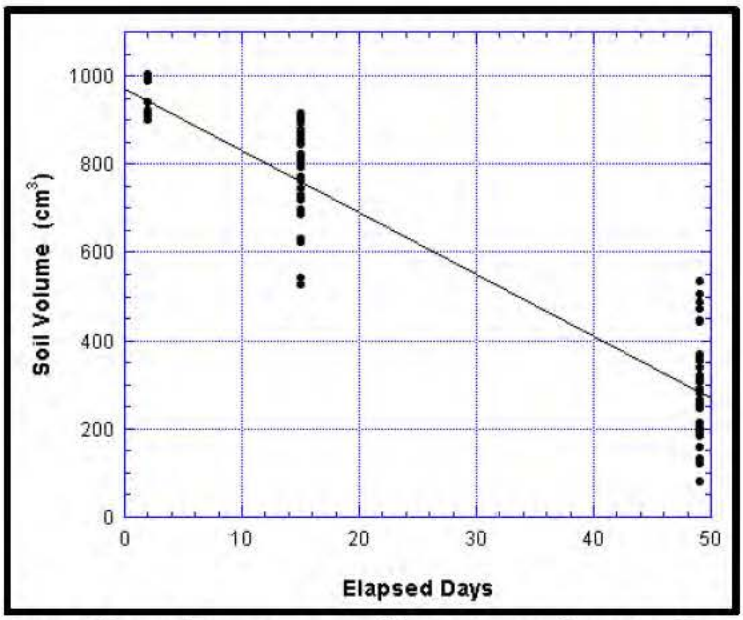


FIGURE 19 APPROXIMATE VOLUMES OF DRYING CORES

It is understood that drying under these circumstances is almost certainly different from that which would be experienced by windrowed sediments in the field. Nevertheless, the data may suggest a minimum time needed for drying. Figure 17 suggests that dewatering by gravity and evaporation can be expected to take a minimum of one to two months. It will of course be further slowed if the material is piled thickly or if the underlying sand is close to saturated.

Organic Sediment Volumes in the Hilliard Island Area

Two polygons of possible additional scrape areas were identified by FWC in the northwest portion of East Lake Toho, referred to as the Hilliard Island polygons (Figure 18). The distribution of vegetation classes was quite different on Hilliard Island compared to the proposed eastern scrape area. The Hilliard Island polygons were much more strongly dominated by cattail or a mix of cattail with other species, while islands with woody vegetation were almost completely absent (Table 5). Generally, benthos in Hilliard Island area with little true muck; instead it was composed of roots, rhizomes, and leaf litter/detritus (Figure 21). The lakeward edge of the cattail was often bordered by a thin strip of tussock composed of pickerel weed and other species.

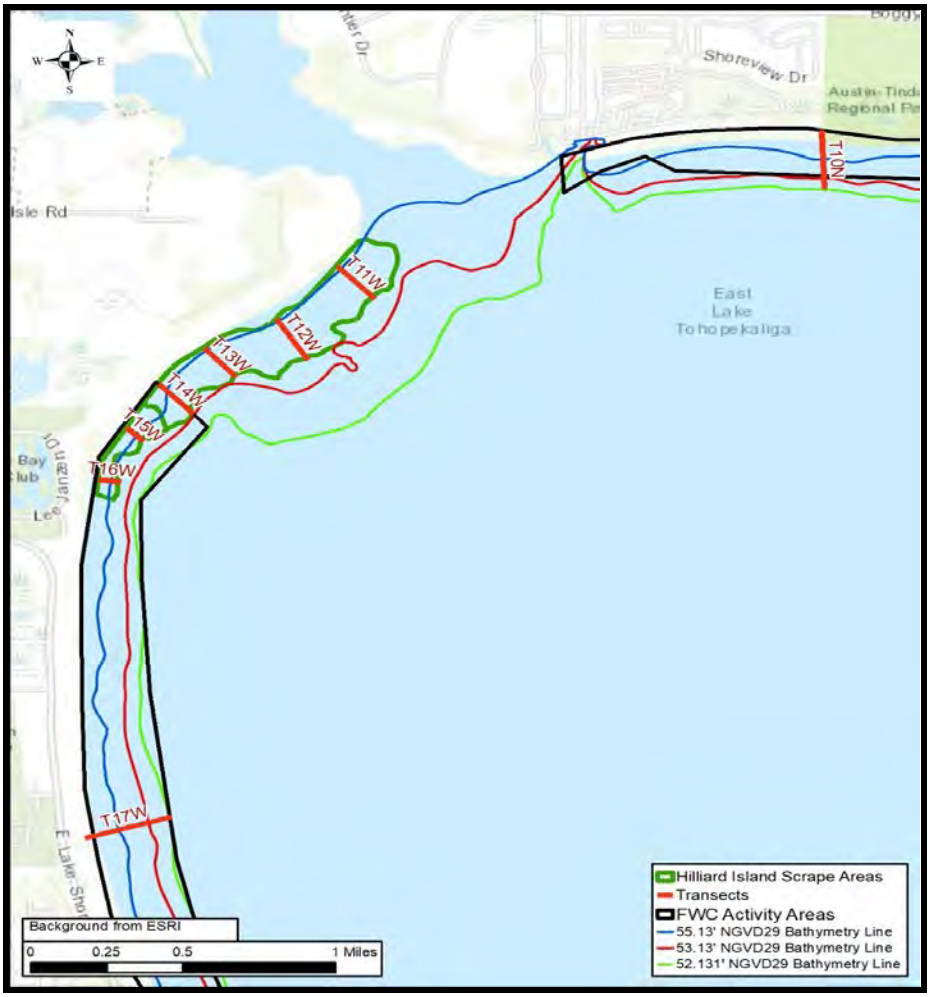


FIGURE 20 HILLIARD POLYGONS IDENTIFIED FOR POSSIBLE SCRAPING AND ORGANIC SEDIMENT TRANSECT LOCATIONS

FIGURE 21 ORGANIC SEDIMENTS FROM CATTAIL AREAS WITHIN HILLIARD POLYGONS WERE MOSTLY ROOTS, LEAF LITTER WITH VERY LITTLE MUCK OR PEAT

TABLE 5 COVERAGE OF THE URS (2016) VEGETATION CLASSES WITHIN THE TWO HILLIARD ISLAND POLYGONS

FLUCCS Code	Letter Code	Vegetation Class	Cover %
6412	T	Cattail	51
6412-6440	TN	Cattail, Mixed Pads	15
6412-6420	TP	Cattail, Pickerelweed/Arrowhead	10
6420	P	Pickerelweed/Arrowhead	5
6410	FWM	Freshwater Marsh	5
6421-6440	ScN	Bulrush, Mixed Pads	3
6442	Nu	Spatterdock	3
6420-6440	PN	Pickerelweed/Arrowhead, Mixed Pads	3
6181	W	Willow	1
6424-6440	LPN	Water primrose/Knotweed, Mixed Pads	1
6417	MWS	Freshwater marsh with shrubs, brush, and or vines	1
6412-6421	TSc	Cattail, Bulrush	1
6421	Sc	Bulrush	1
6440	NNN	Mixed pads (spatterdock, lilies, and or Amer. lotus)	0.3
6424	LP	Water primrose/Knotweed	0.2
6450	SAV	Submerged Aquatic Vegetation	0.2
6440	NN	Lilies	0.1
5200	OW	Lake (Open Water)	0.1
6301	OWF	Other wetland forest	0.1
6412-6424	TLP	Cattail, Water primrose/Knotweed	0.0
		Total	**100**

Organic matter thickness and distribution were sampled and it was noted if tussocks were present along six transects within these two polygons. Figure 22 illustrates a representative transect from the Hilliard Island area, passing almost solely through cattail with the exception of a tussock containing willow and wax myrtle (400 feet to 500 feet).

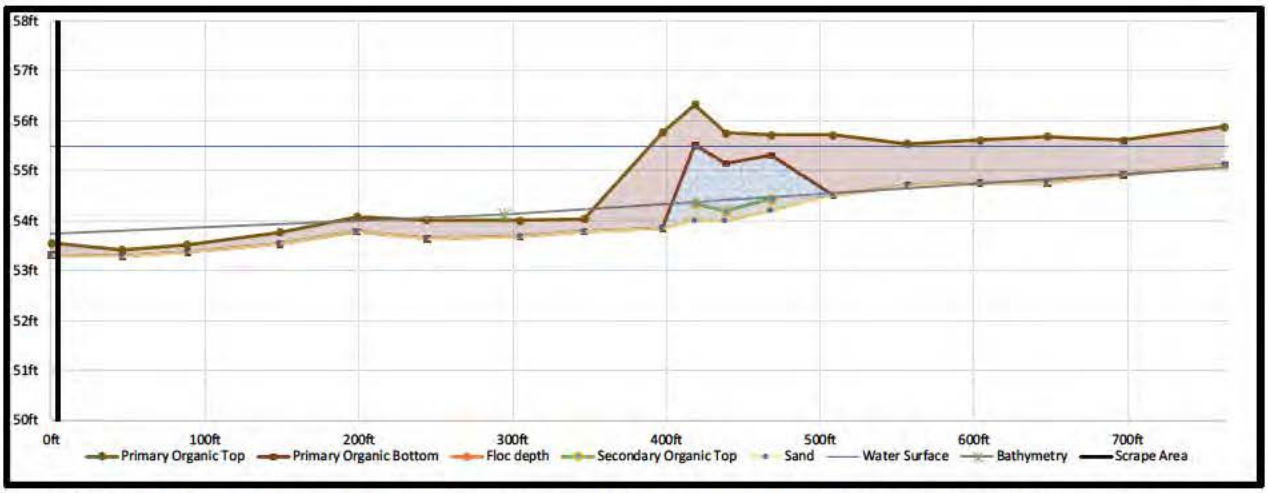


FIGURE 22 TRANSECT 11W THROUGH ONE OF THE HILLIARD ISLAND POLYGONS

Data processing was the same as for the proposed eastern scrape area. Table 6 provides the vegetative classes, ordered by their areal extent within the two Hilliard Island polygons, and the associated estimates of organic sediment thickness by vegetation class. Again, data was used from all points on East Lake Toho to provide the most robust estimates of sediment thickness as a function of vegetation class. The wet volume (last column) is the product of the mean thickness and the area.

TABLE 6 ORGANIC SEDIMENT THICKNESSES BY VEGETATION CLASS AND WET VOLUMES IN THE HILLIARD POLYGONS

Letter Code	Vegetation Class	Thickness			Area	Volume
		N	Mean	SD	(URS)	(Wet)
			(cm)	(cm)	(acres)	(acre-feet)
T	Cattail	42	18	13	63	37.6
TN	Cattail, Mixed Pads	29	15	12	18	9.2
TP	Cattail, Pickerelweed/Arrowhead	10	27	9	12	11.0
P	Pickerelweed/Arrowhead	12	19	7	6	4.0
FWM	Freshwater Marsh	16	27	7	6	5.1
MWS	Freshwater Marsh with shrubs, brush, and or vines	40	34	18	20.9	23.1
NN	Mixed Pads (Lilies)	8	11	7	18.5	6.7
W	Willow	--	34[1]	--	6.8	7.5
PN	Pickerel/Arrowhead, Mixed Pad	--	15[2]	--	5.3	2.6
OW	Lake/open water	5	10	12	2.4	0.8
TSc	Cattail, Bulrush	10	15	11	2.1	1.1
SAV	Submerged Aquatic Vegetation		10[3]		1.9	0.7
Nu	Spadderdock	14	17	8	1.7	0.9
PSc	Pickerelweed/Arrowhead, Bulrush	--	16[4]	--	1.3	0.7
ScN	Bulrush, Mixed Pads	10	15	10	1.3	0.6
LP	Water primrose/Knotweed	2	29	18	0.3	0.3
Sc	Bulrush	8	12	14	0.3	0.1
	Totals				**112.6**	**81.9**

Notes:
[1]Thickness for PN estimated as average of NN and P
[2]Thickness for W estimated as same as MWS
[3]Thickness for LPN estimated as average of LP and NN
[4]Thickness for NNN estimated as same as NN
[5]Thickness for SAV estimated as same as OW
[6]Thickness for OWF estimated as same as MWS
[7]Thickness for SAV estimated as average of T and LP

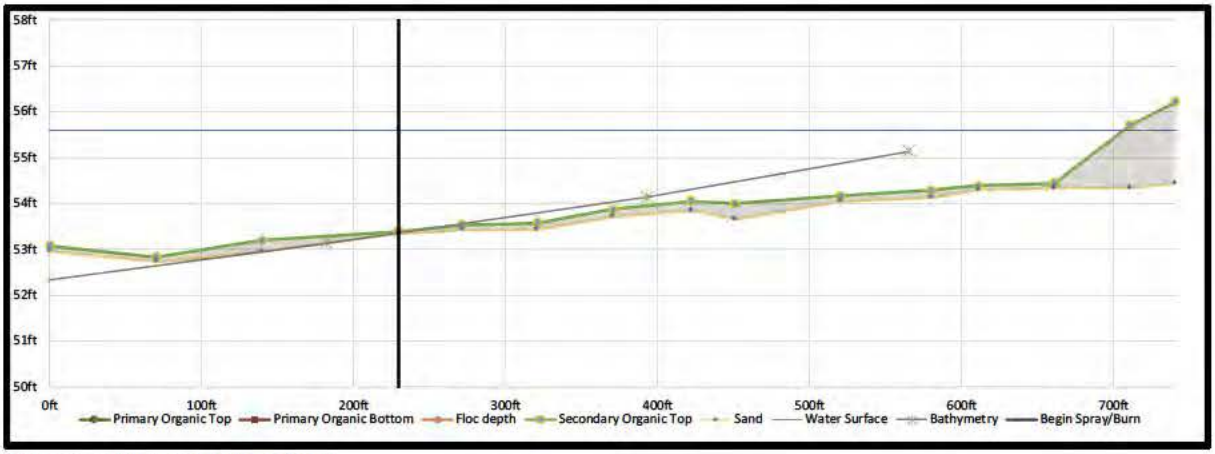
The *total wet mass* of the organic sediments of the Hilliard Island polygons can be estimated using the density of water. Thus for the total volume of 77.8 acre-feet (95,965 m^3) shown in Table 6, the total wet mass would be (95,965 m^3) * (1000 kg/m^3) or approximately 100,000,000 kgs 220,000,000 lbs or 106,000 tons.

The *total dry mass* of the Hilliard Island polygon sediments is equal to the sediment volume times an average bulk density, 0.09 g/cm^{-3}, or (95,965 m^3) * (90 kg/m^3) = 8,640,000 kg, or approximately 9,500 tons. Note that this dry mass estimate is for the hypothetical case in which the sediments are fully air dry.

In summary, the Hilliard Island polygons were of different vegetation from the proposed eastern scrape area; the Hilliard Island area was dominated by cattails while woody vegetation was almost completely absent (Table 6) as well as an elevated berm of organic sediments. The total wet volume and dry mass of the Hilliard Island area sediments was very similar to the volume and mass of the proposed eastern sediment scrape area.

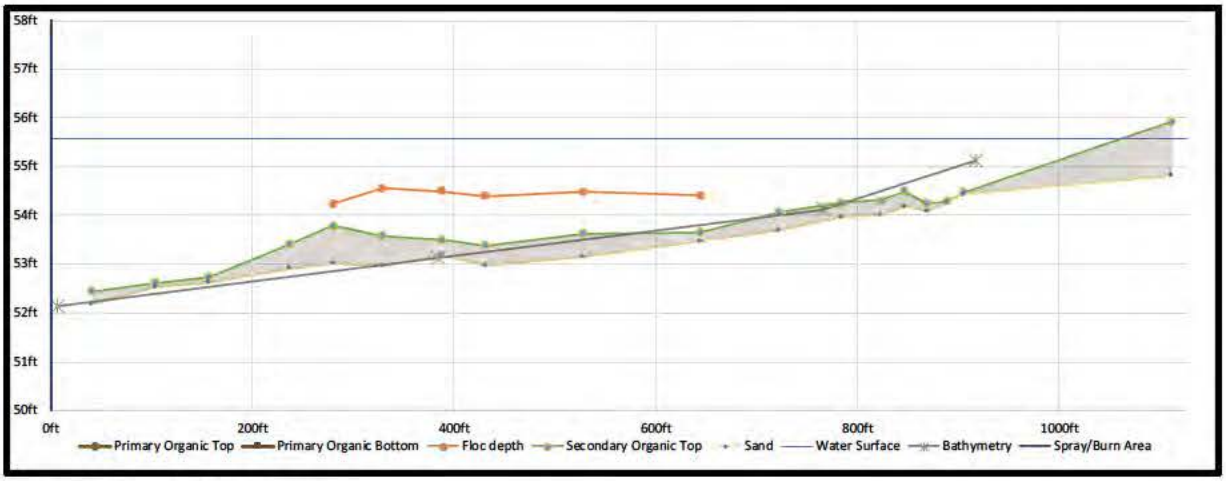
Organic Sediment Volumes and Vegetation of Comparison Transects

In addition to the transects in the proposed eastern scrape area and in the Hilliard Island polygons, organic sediment thicknesses were measured along two additional transects, T10N and T17W, one each on the northern and western sides of East Lake Toho (Figure 23 and Figure 24). These measurements provide a basis for comparison with the areas proposed for organic sediment removal due to East Lake Toho drawdown and scraping.



Note: See Figure 1 for location.

FIGURE 23 TRANSECT 10N



Note: See Figure 1 for location.

FIGURE 24 TRANSECT 17W

Figure 23 and Figure 24 reveal that much less organic sediment, approximately 0.5 feet (15 cm), was present in these parts of East Lake Toho's littoral zone than that seen either in the proposed eastern scrape area (Figure 14 and Figure 15) or in the Hilliard Island polygons (Figure 22).

Fells Cove Organic Sediment Thicknesses

Sediment thickness within Fells Cove was estimated by sounding from an airboat along a west to east transect across the cove (Figure 25). Organic sediments were thin: a mean of 16±14 cm, with a range of 0 to 45 cm (Figure 26). As expected, sediment thicknesses were greater in the littoral zone with a mean of 42 cm (separate point samples; Figure 4; Appendix 2).

FIGURE 25 LOCATION OF TRANSECT OF ORGANIC SEDIMENT THICKNESSES ACROSS FELLS COVE

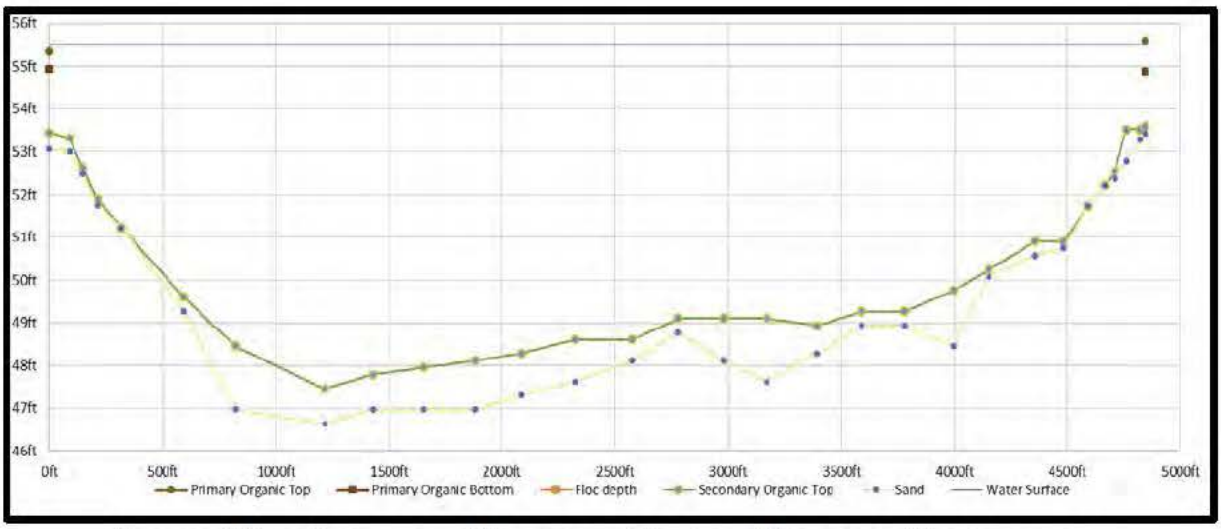


FIGURE 26 PROFILE OF MEASURED ORGANIC SEDIMENT THICKNESSES ACROSS FELLS COVE

Lake Runnymede Organic Sediment Thicknesses

Sediment thickness within Lake Runnymede was estimated by sounding from an airboat along a northwest to southeast transect across most of East Lake Toho (Figure 27). The southeastern most portion of Lake Runnymede was shallow and covered with a dense stand of water lily and therefore inaccessible by airboat. Organic sediments were much thicker than in Fells Cove or in East Lake Toho: a mean of 181±59 cm (Figure 28). The nature of the organic sediments was quite different; an amorphous, structure-less, black, almost syrupy material. While it seems highly likely that the large majority of the layer is anaerobic and hence subject to gas production, the lack of structure suggests that the material is unlikely to float up in large chunks as a result of changing water levels in Lake Runnymede. Reliable firsthand observations by long-term residents or users of Lake Runnymede may be a useful additional source of information regarding behavior of these organic sediments. We also note that the Institute for Food and Agricultural Sciences Tussock Management Report includes a photo of Lake Runnymede with surface water completely absent and a thick growth of colonizer plant species (https://plants.ifas.ufl.edu/manage/why-manage-plants/tussocks-and-floating-islands/managing-tussocks-and-floating-islands/). If root growth were to penetrate deep enough it is certainly possible that this could stabilize the organic sediments sufficiently that a subsequent rise in water levels could cause peat popups.

FIGURE 27 LOCATION OF TRANSECT OF ORGANIC SEDIMENT THICKNESSES ACROSS LAKE RUNNYMEDE

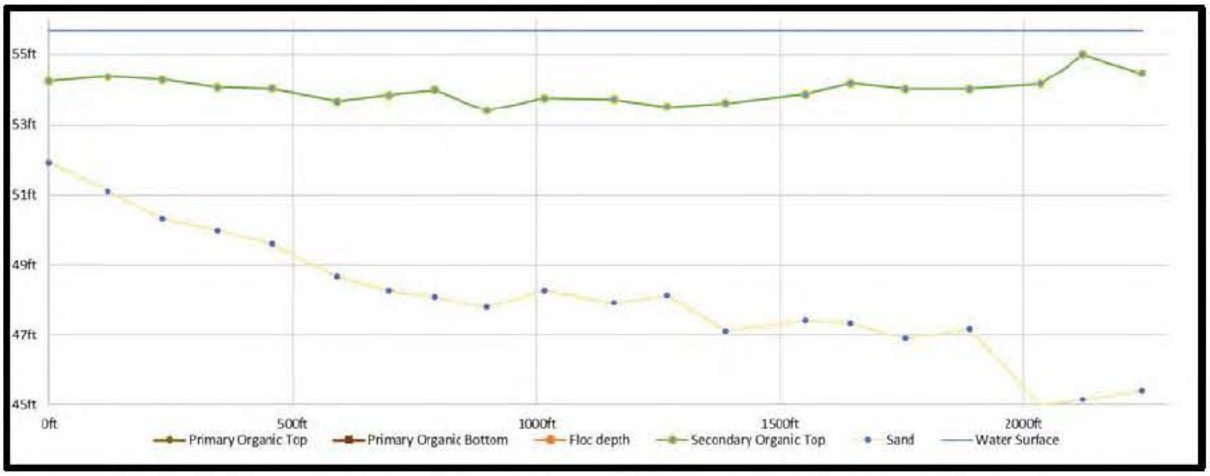


FIGURE 28 PROFILE OF MEASURED ORGANIC SEDIMENT THICKNESSES ACROSS LAKE RUNNYMEDE

Temporal Comparison of Shoreline Organic Sediment Thicknesses, 2008 to 2018

A decadal examination of organic sediment thicknesses in the eastern and western littoral zones of East Lake Toho and of Fells Cove was performed using an available dataset. Sawka (2008) measured sediment thicknesses at fourteen points in those locations in 2008 (Figure 4). Unfortunately, exact locations were not provided by Sawka (2008), therefore the SFEC Team was only estimate the locations by georectification of the publication's site map. In 2018, organic sediment thicknesses were measured at or near twelve of these original fourteen locations (Figure 4; two of the sites were not accessible by airboat or by foot). Direct comparisons were hindered by differing terminology and methodology, so only total thicknesses were compared from both time periods, summing any layer subtotals.

Figure 29 illustrates the wide range in differences in sediment thicknesses, yet the mean difference was approximately 1 cm. If the one extreme value of -145 cm is considered an outlier and changed to a more consistent difference of -45 cm, the mean difference increases to only 5 cm. Given the spatial variability in sediment thicknesses, the inability to revisit exact locations and the lack of permanent, bedrock-anchored benchmarks, we are unable to make point comparisons about temporal changes in sediment thickness. Although unable to revisit the exact locations sampled in 2008, the overall means in sediment thickness suggest minimal temporal change.

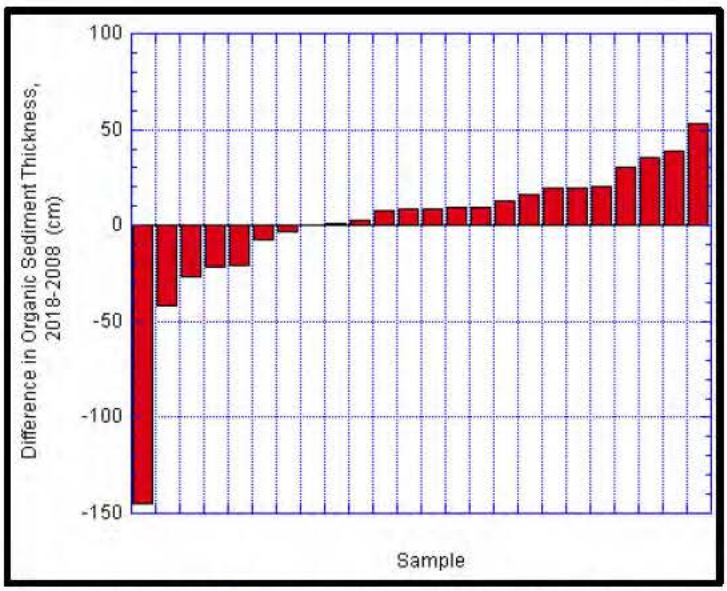


FIGURE 29 DISTRIBUTION OF DIFFERENCES IN ORGANIC SEDIMENT THICKNESSES MEASURED IN 2018 MINUS THOSE MEASURED AT APPROXIMATELY THE SAME LOCATIONS IN 2008

Analysis of Soil Contaminants and Nutrients

Based on the soil and organic matter contaminant analysis, it can be assumed that metals are not a primary concern. Most of the material had low concentrations or the concentrations fell

between the practical and minimum detection limits. Lead levels, for instance had a high of 50 parts per million (ppm) and where the standard in soils ranges from 400 ppm to 1200 ppm depending on location (40 Code for Federal Regulation [CFR] Part 745, 2001 for federally funded projects). On average, soil organics contained approximately 10 ppm lead (by icp digestion). Similarly, detectable arsenic levels were all below 10 ppm. All detectable samples fell between the method detection limit and the Practical Quantification Limit [PQL (i*)] or were undetectable (Table 7). Antimony was undetectable in all samples and cadmium was undetectable on more than half of the samples (Appendix 3).

TABLE 7 MEAN CONTAMINANT CONCENTRATIONS FOR METALS

	Mean (ppm)	Stddev	N	i*	U
Arsenic	4.1	2.5	29	20	9
Cadmium	0.23	0.13	29	12	17
Chromium	8.4	9.5	29	4	8
Lead	10.0	10	29	14	3
Mercury	0.09	0.07	29	16	1

The polycyclic hydrocarbons, phenanthrene and fluoranthene, were undetectable in most samples (based on the mass and moisture content of the samples analyzed). (Appendix 3)

Note: Analyzing higher mass of sample may improve detection of antimony, cadmium, phenanthrene and fluoranthene.

Soil Nutrient Analysis

Table 8 provides the average soil total nitrogen concentrations by transect. Raw sample data is noted in Appendix 2. Average total nitrogen for all samples was 20961 milligrams per kilogram (mg/kg). Samples collected within the eastern transects had higher average total nitrogen than those samples collected from western transects. Soil phosphorus concentrations were only available for a limited number of the samples submitted to AEL Labs (a subset of samples collected from transects from the western shore of Hilliard Island polygon). Samples were analyzed at a high dilution rate which limited detection ability. Approximately 82% of the diluted samples (1/10x) could not detect total phosphorus, while greater than 80% of samples when analyzed directly (1x) provided results. When a small subset of samples were reanalyzed at 1x, results were not fully consistent with the initial analysis; therefore, caution is noted in interpreting the total phosphorus results (Table 9). Similar issues occurred with the ortho-P analysis for water quality samples.

TABLE 8 AVERAGE SOIL TOTAL NITROGEN BY TRANSECT

Transect	Mean TN (mg/Kg)	Standard Deviation	N
T3E	18425	11969	4
T4E	28800	10474	5
T7E	31250	34683	4
T8E	18250	4500	4
T10W	16033	6504	3
T12W	1700		1
T13W	24000		1
T14W	12000		1
T16W	15250	6702	4
T17W	18000	2708	4

TABLE 9 SOIL TOTAL PHOSPHORUS (MG/KG)

Transect	Method	Dilution	Adjusted Reporting Limit	Total Phosphorus mg/Kg	Qualifier Only	TP (mg/Kg) rerun subset
T10W	EPA 365.4	10	240	760		
T12W	EPA 365.4	1	93	490		
T12W	EPA 365.4	1	99	99	U	
T13W	EPA 365.4	10	1200	1200	U	
T14W	EPA 365.4	10	350	350	U	
T16W	EPA 365.4	10	1900	1900	U	1000
T16W	EPA 365.4	1	160	220		
T16W	EPA 365.4	10	530	530	U	610
T16W	EPA 365.4	10	420	420	U	490
T17W	EPA 365.4	10	970	970	U	980
T17W	EPA 365.4	1	85	380		740
T17W	EPA 365.4	1	63	680		550
T17W	EPA 365.4	1	80	81	1	820

Note: U denotes the constituent was undetectable at given mass (based on adjusted reporting limits)

Nutrient Flux

TABLE 10 TOTAL NITROGEN FLUX PER LITER RAINWATER PER GRAM DRY WEIGHT SOIL

Client Sample ID	Adjusted Reporting Limit	TN Final Result (mg/L)	g/dw soil/L	TN Flux mg/L/g
T1855A SW	0.10	1.70	6.00	0.28
T1855B SW	0.10	3.00	7.00	0.43
856A SW+Marsh w/shrubs	0.10	2.40	7.00	0.34
856B SW+Muck	0.10	2.60	7.00	0.37
859 SW+Nymp	0.10	3.90	7.00	0.56
863A SW+Porot+Myrium	0.10	3.70	7.00	0.53
863B SW	0.10	2.80	6.50	0.43
864 SW+Pent+Lud	0.10	0.1U*	7.00	
865 SW+Cattail	0.10	2.40	9.00	0.27
866B Myrica+SW	0.10	2.50	10.00	0.25
867A SW	0.10	1.70	14.00	0.12
868 SW from ELT	0.10	2.00	7.00	0.29
869 SW from ELT	0.10	1.60	7.50	0.21
870 SW from ELT	0.10	5.00	7.00	0.71
RWB-1 RW from LW	0.10	0.82	RW blank	0.82
RWB-2 RW from LW	0.10	1.60	RW blank	1.60

TABLE 11 NITRATE FLUX PER LITER RAINWATER PER GRAM DRY WEIGHT SOIL

Client Sample ID	Adjusted Reporting Limit	Nitrate (mg/L)	dw soil (g)/L	Nitrate (mg/L/g)
T1855A SW	0.05	0.26	6.00	0.04
865A SW+Marsh w/shrubs	0.05	0.28	6.50	0.04
859 SW+Nymp	0.05	0.05U*	7.00	
863A SW+Porot+Myrium	0.05	0.33	7.00	0.05
865 SW+Cattail	0.05	0.21	9.00	0.02
866A	0.05	0.32	9.00	0.04
866B Myrica+SW	0.05	0.40	10.00	0.04
RWB-1 RW from LW	0.05	0.32	Blank	

TABLE 12 TOTAL PHOSPHORUS CONCENTRATIONS

Sample ID	Dilution	Adjusted Reporting Limit	TP (mg/L)	Qualifier
T1855A SW	1	0.096	0.096	U
T1855B SW	1	0.096	0.096	U
865A SW+Marsh w/shrubs	1	0.096	0.096	U
865B SW+Muck	1	0.048	0.048	U
859 SW+Nymp	1	0.096	0.096	U
863A SW+Porot+Myrium	1	0.096	0.096	U
863B SW	1	0.096	0.096	U
864 SW+Pent+Lud	1	0.096	0.096	U
865 SW+Cattail	1	0.096	0.096	U
866B Myrica+SW	1	0.096	0.096	U
867A SW	1	0.096	0.096	U
868 SW from ELT	1	0.096	0.096	U
869 SW from ELT	1	0.096	0.096	U
870 SW from ELT	1	0.096	0.38	
RWB-1 RW from LW	1	0.048	0.048	U
RWB-2 RW from LW	1	0.048	0.048	U

CONCLUSIONS/DISCUSSION

Vegetation and associated organic sediments in the littoral zone of East Lake Toho was examined using a combination of fieldwork, remote sensing and chemical analysis. Field observations of vegetation generally matched well with the URS 2016 remote sensing-based vegetation map. Using transects and additional point samples, four different portions of East Lake Toho littoral zone were examined: the west, north, an area to the east proposed for scraping, and an area to the northwest near Hilliard Island, under consideration for possible scraping (Figure 1). Visible and measurable differences were noted in vegetation and in associated organic sediment thicknesses between these four different portions of the littoral zone. The northern and western portions were primarily cattail and cattail with lilies with very thin organic sediments (Figure 23). The eastern littoral zone, proposed for vegetation removal and sediment scraping, had the most established and woodiest vegetation, as well as the thickest sediments (Figures 14 and Figure 15). The Hilliard Island portion of the littoral zone was dominated by extensive cattail stands, often very tall and dense. Organic sediment thicknesses and volumes in the Hilliard Island portion (Table 6) were similar but slightly less than those found in the proposed eastern scrape area (Table 4).

Bulk density of the organic sediments was estimated using 33 sediment core samples. Bulk densities were very low, averaging 0.09 g/cm^{-3} and varied little between samples (range: 0.04 to 0.14 g/cm^{-3}). The dry volume of the air-dried bulk density cores was approximately 29% of the original wet volume.

The wet volume of the proposed eastern scrape area (113 acres) was estimated as 82 acre-feet. Since the bulk density was so low, the wet weight is essentially the weight of the same volume of water, or 110,000 tons. The dry weight, assuming fully air dry, would be approximately one tenth of that or approximately 11,000 tons. The dry volume, assuming fully air dry, would be approximately 24 acre-feet.

It took between 30 and 50 days to dry the sediment core samples to constant air dry weight. Based on this drying time, it is assumed that the scraped and windrowed organic sediments would not come to full air dryness in the available time before the sediments would be required to be transported.

One option proposed for disposal of the windrowed, partially dried scrape material is to create one or more spoil islands within East Lake Toho with a proposed maximum height of 15 feet. Estimates for the area of the spoil islands can be bracketed using the estimates of the total wet and dry volumes of organic sediments, noting that the actual size would fall somewhere between the wet and dry extremes. At 15-feet high, the area of the spoil island(s) would fall between 2 and 6 acres. Note that these estimates include only the organic sediment material, not the vegetation currently growing on the top.

Approximately 20% of the 113 acres in the proposed eastern scrape area is covered by islands (also referred to as a berm). Much of the island area is covered by woody vegetation, some of which is tall and substantial. Based on field observations, the associated organic sediments were cohesive, apparently held together in part by extensive root networks, and their upper surface was

typically above the water surface. While the sediments did not always rest directly on the underlying sand, it appeared that large roots from the woody vegetation did extend down into the sand, apparently anchoring the islands in place.

The SFEC Team suggests that there may be ecological value in preserving some of the most substantial islands. After joint field inspection by SFEC and FWC staff of the islands proposed for possible retention, a subset of approximately 7 acres of islands plus limited additional surrounding habitat were identified. Retention of this subset of islands would reduce the burden on the proposed spoil islands, perhaps by as much as 10%.

It should be noted that the proposed maximum height of 15 feet would limit the footprint of open water and marsh habitat directly impacted by island construction, and it would also limit the habitat benefits provided by the proposed spoil islands. To optimize wildlife benefits of islands, Division of Wildlife (a branch of the FWC; 1998) recommended that 1) islands be kidney-shaped with irregular edges (forming bays), 2) the shoreline slope should be irregular and not greater than 4:1, 3) islands should be from 0.25 acres to 2 acres in size with a low profile that does not exceed 3 feet above the high pool stage. The Division of Wildlife (1998) also noted that funds and manpower should be allocated to manage islands to provide wildlife benefits (vegetation and structure). It is understood that these recommendations are aimed at enhancing wildlife habitat on the islands and neighboring islands and therefore a balance must be struck between the specific goals and objectives of the current Project and the general goals of building islands for habitat. For instance, clearly limiting the number of proposed spoil islands would increase the expected height of the islands. Additionally, given the expectation that spoil islands would be used in the future for lake and vegetation management and maintenance of East Lake Toho, the spoil islands would undergo future disturbance and would unlikely provide particularly beneficial habitat on their own (given the expected heights of the islands over high pool). This is not to say that construction of the islands would not provide environmental benefits to East Lake Toho but rather the islands (one or two) themselves will provide limited habitat and ecosystem function. Rather the primary benefit of the islands would be for future habitat management: removing tussocks which have extensive sediments associated with the roots (those with high shrub cover) and for future placement of muck if removed during low water periods. Depending on construction specifications of the proposed spoil islands (edge area ratio and slopes) some additional littoral habitat can be created on the outer edge of the littoral zone.

Fells Cove and Lake Runnymede

Because Fells Cove and Lake Runnymede are hydrologically connected to East Lake Toho concerns arose about possible undesirable effects of the organic sediments contained within them. Transects measured across Fells Cove and Lake Runnymede indicated very different conditions. Fells Cove had fairly deep water and very little sediments, an average of less than 1-foot thick in the interior of the lake. Lake Runnymede in contrast had shallow water and very thick, unconsolidated sediments, approximately 7 feet to 8-feet thick. The unconsolidated nature of Lake Runnymede sediments suggests they are unlikely to float as peat pop-ups. However, if water levels were held below the sediment surface long enough for plant colonization, root growth could stabilize an upper portion of the sediments, making pop-ups more likely when water levels rise

again. Additionally, oxidation of loose sediments may result in nutrient flux into the water upon rewetting, after which enriched waters may mix with surface water in ELT.

Chemical Analysis

Organic sediment samples extracted from the East Lake Toho littoral zone for chemical analysis included: metals, selected anthropogenic organic compounds, and nutrients. A simple nitrogen and phosphorus leaching study was preformed to estimate the likelihood of harmful leachate being released into East Lake Toho from any potential in-lake spoil islands.

Metals do not appear to be a concern; most of the material had low concentrations or concentrations near the practical or minimum detection limits. Lead levels, for instance had a high of 50 ppm where the standard in soils ranges from 400 ppm to 1200 ppm depending on location (40 CFR Part 745, 2001 for federally funded projects). Soil organics contained approximately 10 ppm lead (by icp digestion). Similarly, detectable arsenic levels were all below 10 ppm. Generally, samples fell between the method detection limit and the PQL or were undetectable.

The polycyclic hydrocarbons phenanthrene and fluoranthene were undetectable in most samples (based on the mass and moisture content of the samples analyzed).

Average soil nutrient concentrations generally fell within ranges found elsewhere in wetland and lake systems in central and south Florida. For instance, total nitrogen concentrations averaged 24.5 grams per kilogram (g/Kg) for samples collected on the east side of East Lake Toho while samples collected by Newman *et al* (1998) in Holey Land Wildlife Management Area contained 25.5 g/Kg of total nitrogen. Samples collected on the western side of East Lake Toho had lower concentrations overall than those found within the eastern scrape polygon (mean= 16.7) but concentrations were highly variable (stdev=5.1). The extensive woody material on the east side of East Lake Toho, particularly the abundance of *Myrica* may account for some of the differences in soil nutrient concentrations between the east and west sides of the lake. *Myrica* is often associated with *Frankia*, a nitrogen-fixing bacteria often found on root nodules of *Myrica*.

Phosphorus concentrations were higher than those found by Gottlieb *et al* (2006) for soils in the oligotrophic southern Everglades (740 mg/kg vs 284 mg/kg) but were similar to the average value of 594 mg/kg found by Newman et al (1998) in the Rotenberger Wildlife Management Area, which is upstream and closer to sources of anthropogenically elevated phosphorus. A few individual samples were slightly elevated in both nitrogen and phosphorus but no statistically significant pattern was observed. Given the limited sampling conducted for this survey, additional samples should be collected associated with any spoil island construction to help document short- and long-term nutrient trends and to establish a construction baseline.

When evaluating the nutrient flux samples, it was noted that most samples fell within the range observed by SFWMD during a sample period between September 2011 and December 2012 (tributary inflow waters) (James 2014). Three of the fourteen nutrient flux samples had higher concentrations of total nitrogen (average 4.2 mg/L versus 2.9 mg/L) than the tributary inflow maximum concentration observed by SFWMD during the 2011-2012 period. Additionally, most of the flux samples had higher concentrations of total nitrogen than those noted at station (BS-59)

by SFWMD during the same 2011-2012 sample period (mean 0.72 mg/L). The high mass of soil added per unit volume of rainwater partially accounts for the elevated values. Results associated with the flux study are consistent with both field studies and lab studies (Roddy and Tomlinson 1989; Gottlieb et al 2005). Roddy and Tomlinson (1989) noted that total suspended, total nitrogen and total phosphorus appeared to be elevated under disturbed peat conditions (in the field). While Gottlieb et al (2005) noted significant increases in total nitrogen, total phosphorus and total organic content flux with increased drying duration (1 month verses 3 months) and subsequent rewetting in a controlled greenhouse study.

The results suggest limited water quality monitoring (and soil sampling) should be conducted with the East Lake Toho drawdown, scrape and island construction. Ideally a more robust lake-wide monitoring plan should be implemented prior to and for a short period after project implementation. This would help identify any potential water quality concerns associated with both the scrape and island construction and the spraying and burning on the northern and western shores. The current monitoring conducted by SFWMD is very limited and provides little information to assess project effects on water quality. It is expected that at lower stages during initial refill, concentrations would be elevated relative to background levels (adjacent to the project areas).

A short-term monitoring plan can be designed to evaluate several project uncertainties including:

1. Does the consolidation of organic matter into islands make nutrients overall less bioavailable?
2. How would the removal of vegetation effect the uptake of soluble nutrient fractions?
3. Does the removal of large patches of vegetation effect the movement of organic matter toward the interior or edges of the lake?

Overall, the East Lake Toho sediment characterization study identified significant organic deposits associated with the eastern shore within the areas currently proposed for habitat enhancement. The study confirmed that vegetation cover/habitat type is a strong indicator of the abundance of organic matter present. Thicker organic deposits were primarily associated with tussocks and islands, whereas deeper areas of the littoral zone with predominantly bulrush have very thin layers of organic matter. Most of the organic deposits found were more cohesive in nature but some areas had loose flocculent organic matter.

The study provided a useful characterization of the differences in sediment distribution and abundance between Lake Runnymede and Fells Cove and indicated an abundance of unconsolidated organic matter in Lake Runnymede and minimal deposits of organic matter in Fells Cove (outside of the littoral zone). These differences suggest that the proposed sheet pile installation between Lake Runnymede and East Lake Toho is warranted to protect water quality in East Lake Toho.

Overall, the study provides a quantitative baseline of organic matter distribution and abundance on East Lake Toho and a useful characterization of sediment abundance by vegetation type. This data, along with changes in sediment volume and bulk density with drying provide a quantitative estimate of organic soils that can be used to help design spoil islands and to address contracting the scrape and hauling aspects of the proposed Project.

ACRONYMS

AEL Lab	Advanced Environmental Laboratories, Inc.
BOD	biological oxygen demand
C	Centigrade
CFR	Code of Federal Regulation
cm	Centimeter
DBH	Diameter at Breast Height
DO	Dissolved Oxygen
East Lake Toho	East Lake Tohopekaliga
EIS	Environmental Impact Statement
FWC	Florida Fish and Wildlife Conservation Commission
g/cm^{-3}	grams per cubic centimeter
g/Kg	grams per kilogram
GIS	Geographic Information System
GPS	Global Positioning System
kg	Kilogram
lbs	Pounds
m	Meter
m^3	Cubic Meter
m/Kg	milligram per kilogram
NGVD29	North Geodetic Vertical Datum 1929
ppm	parts per million
PQL (i*)	Practical Quantification Limit
PVC	Polyvinyl chloride
SFEC	South Florida Engineering and Consulting, LLC
SFWMD	South Florida Water Management District
TKN	Total Kjeldahl Nitrogen

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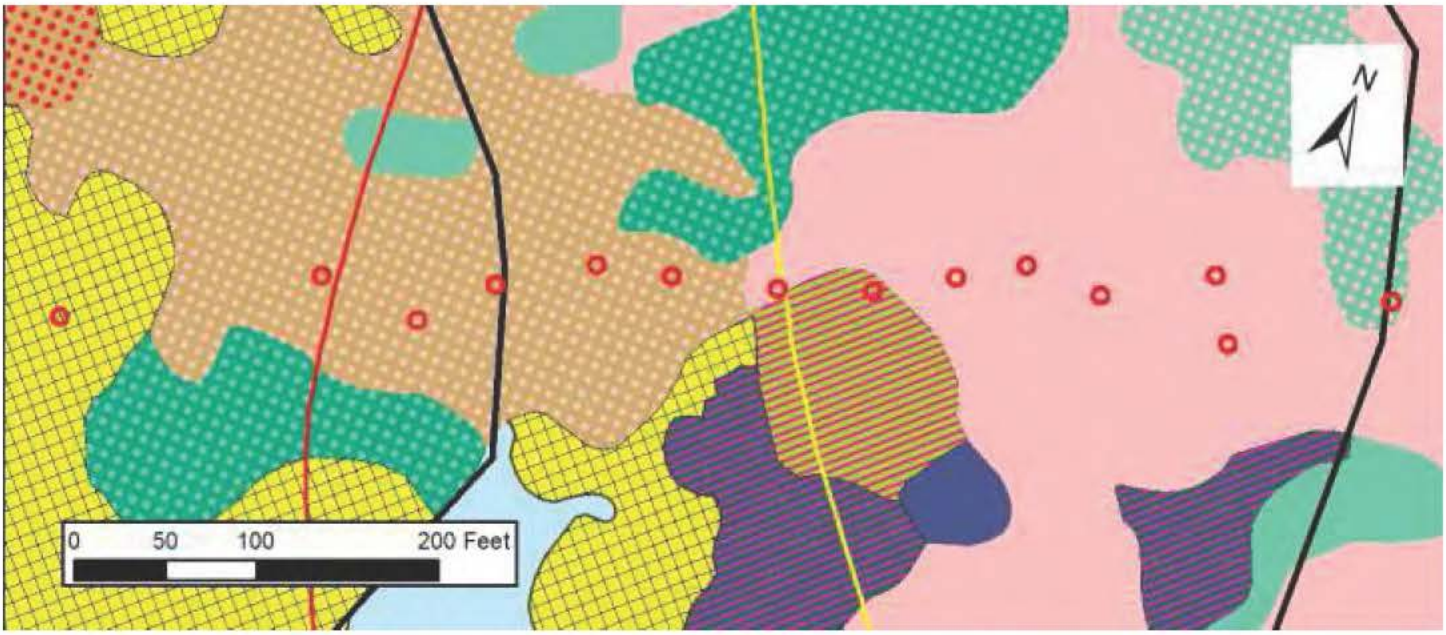
APPENDICES

APPENDIX 1 TASK A1.1
TRANSECT ORGANIC MATTER PROFILES

T1E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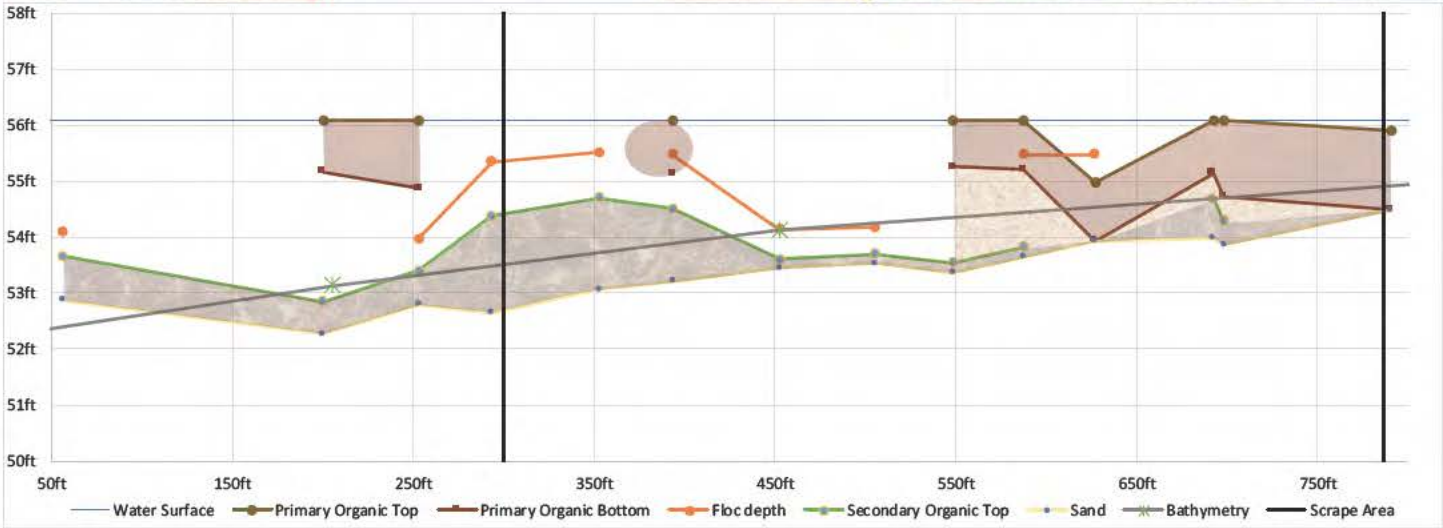
0 50 100 200 Feet

N
0 50 100 200 Feet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52ft
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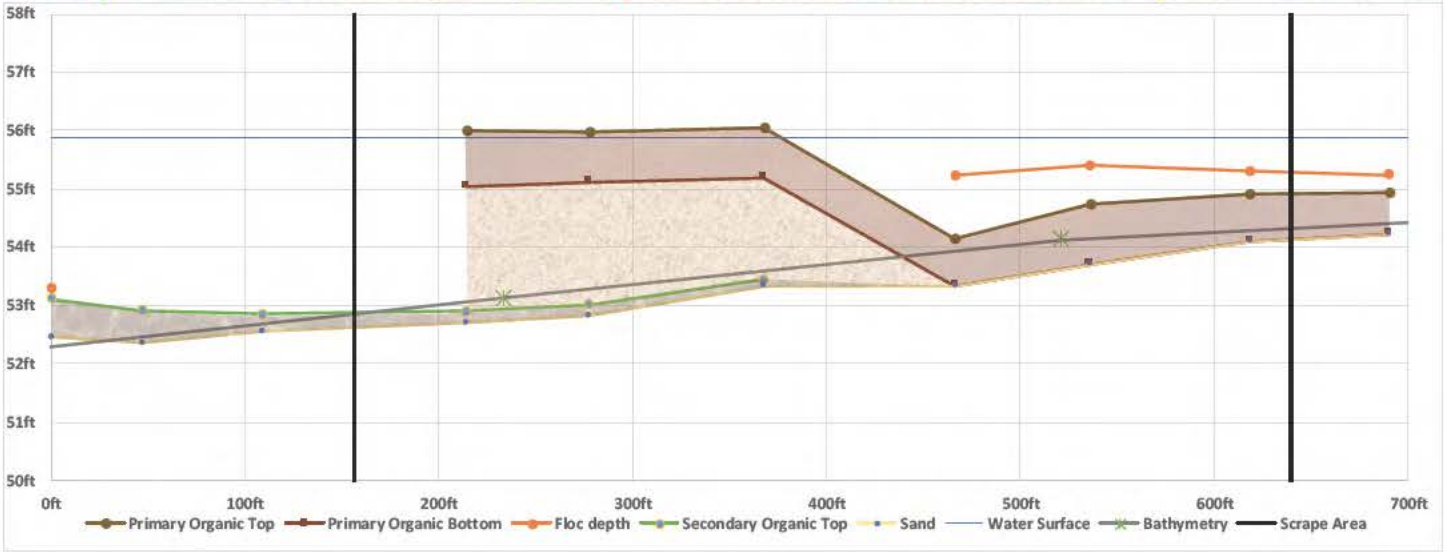
50ft
50ft
150ft
250ft
350ft
450ft
550ft
650ft
750ft
Water Surface
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Bathymetry
Scrape Area

T2E

N
0 25 50 100 Feet

N
0 25 50 100 Feet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0ft
100ft
200ft
300ft
400ft
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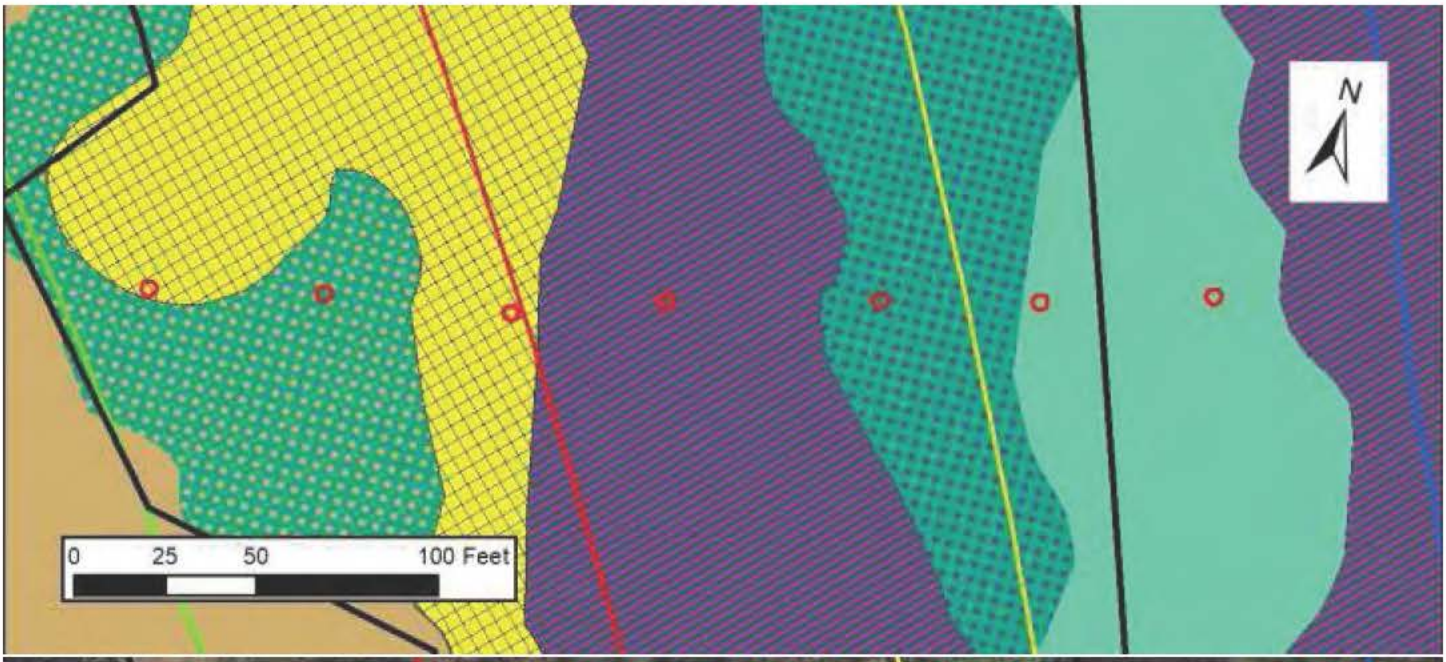
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T3E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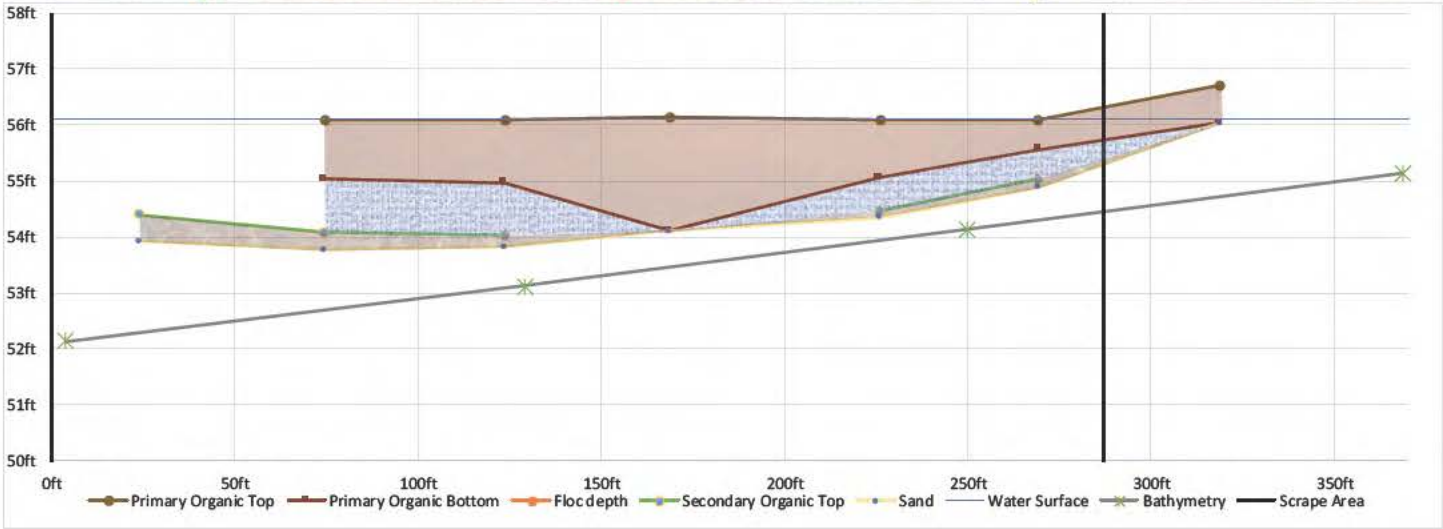
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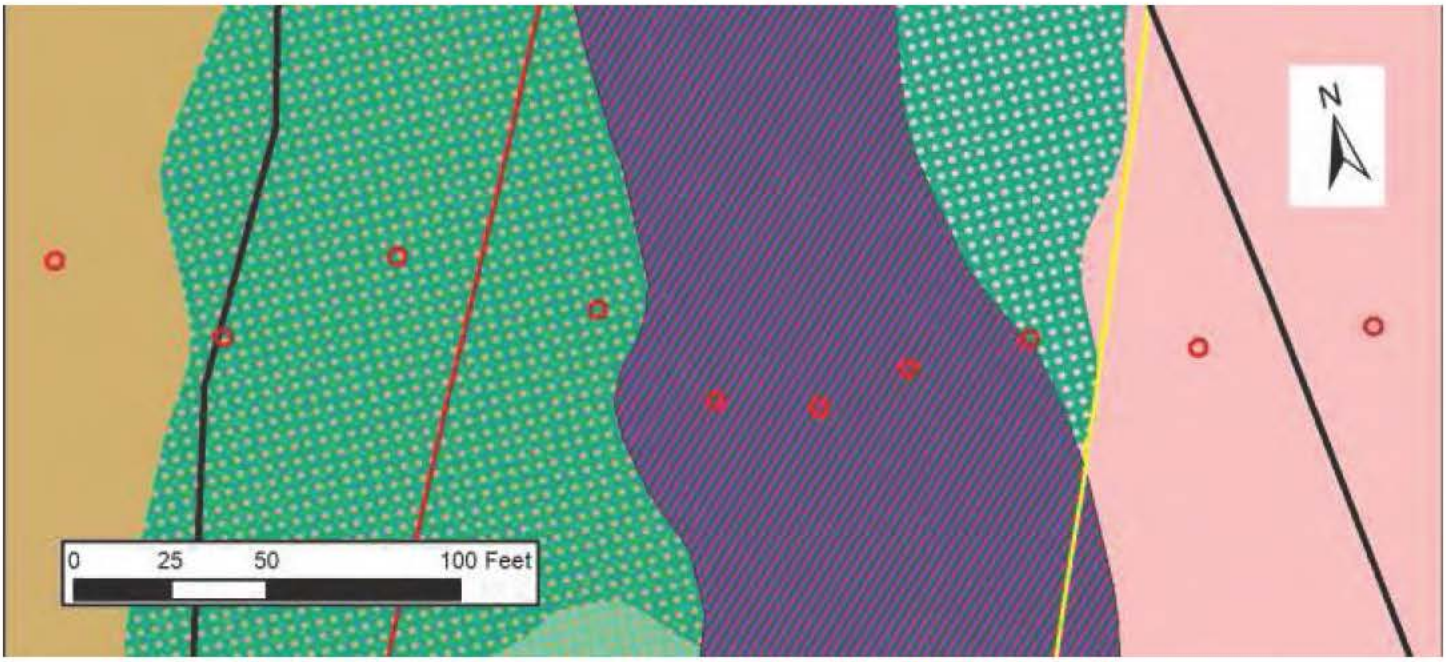
55ft
54ft
53ft
52ft
51ft
50ft
0ft
50ft
100ft
150ft
200ft
250ft
300ft
350ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T4E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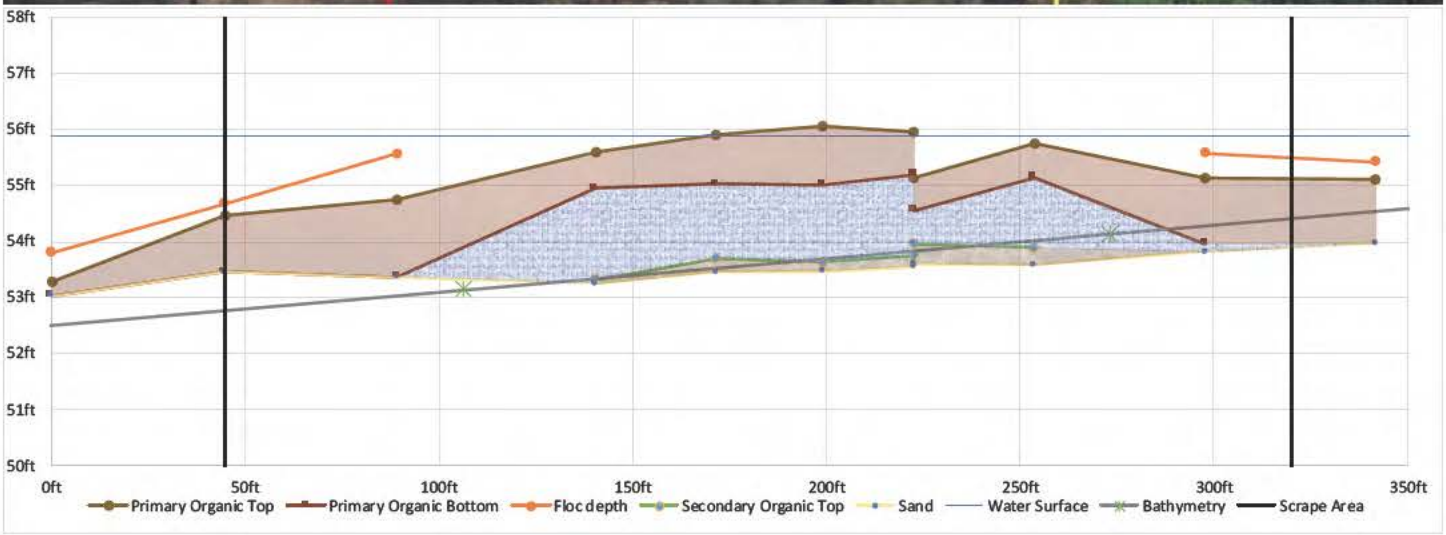
25
50
100 Feet

N
0
25
50
100 Feet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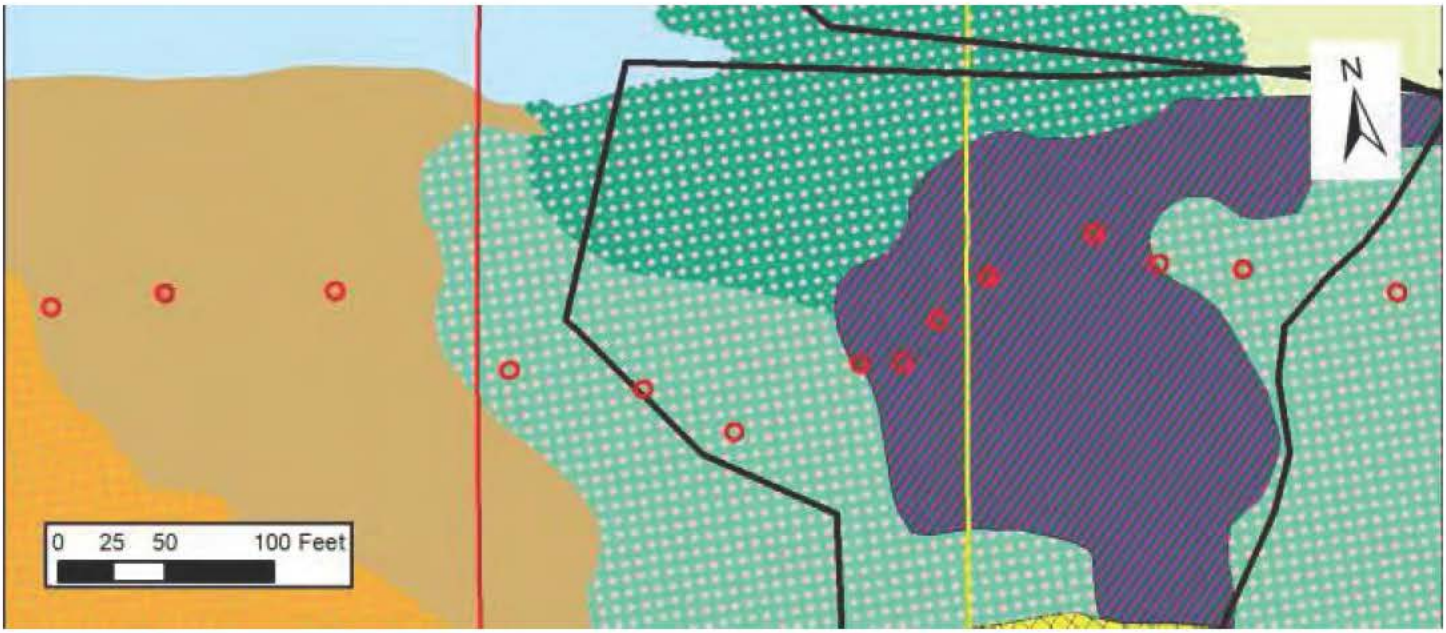
52ft
51ft
50ft
0ft
50ft
100ft
150ft
200ft
250ft
300ft
350ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T5E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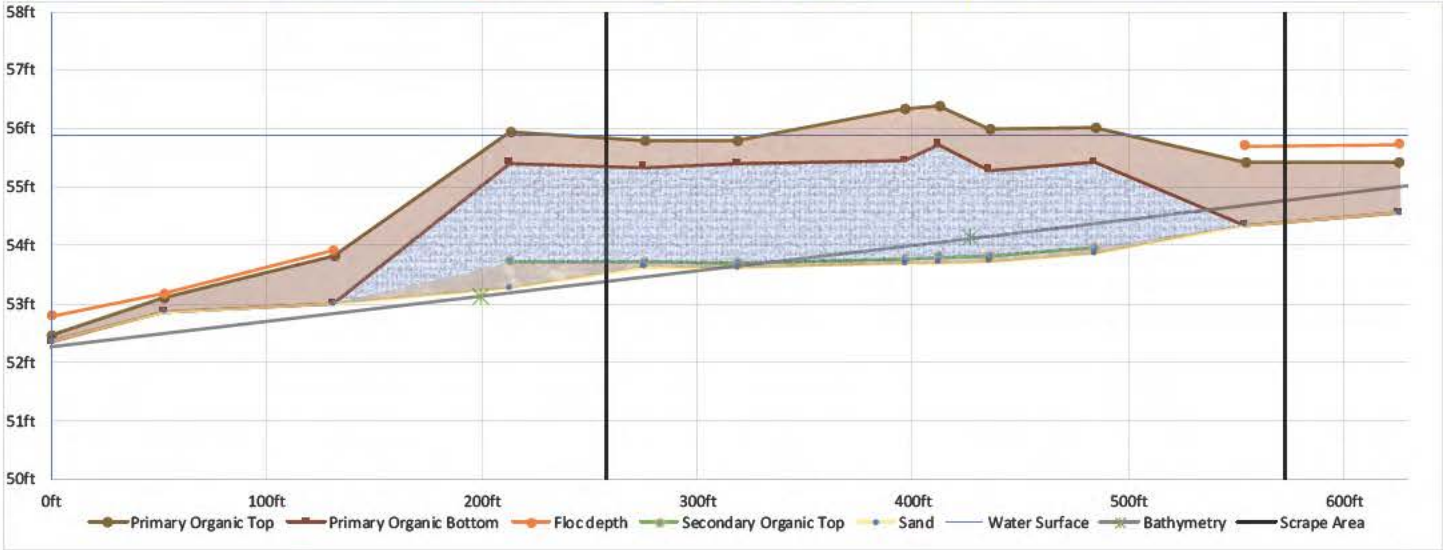
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57ft
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55ft
54ft
53ft
52ft
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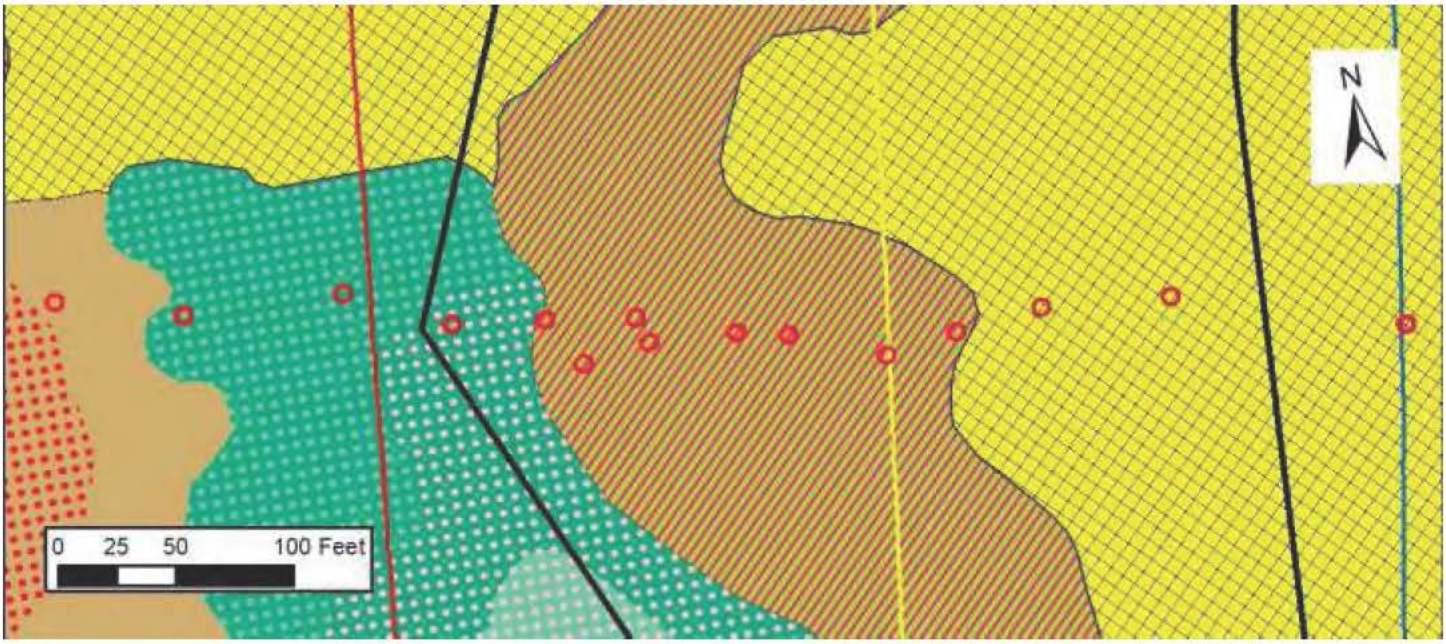
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T6E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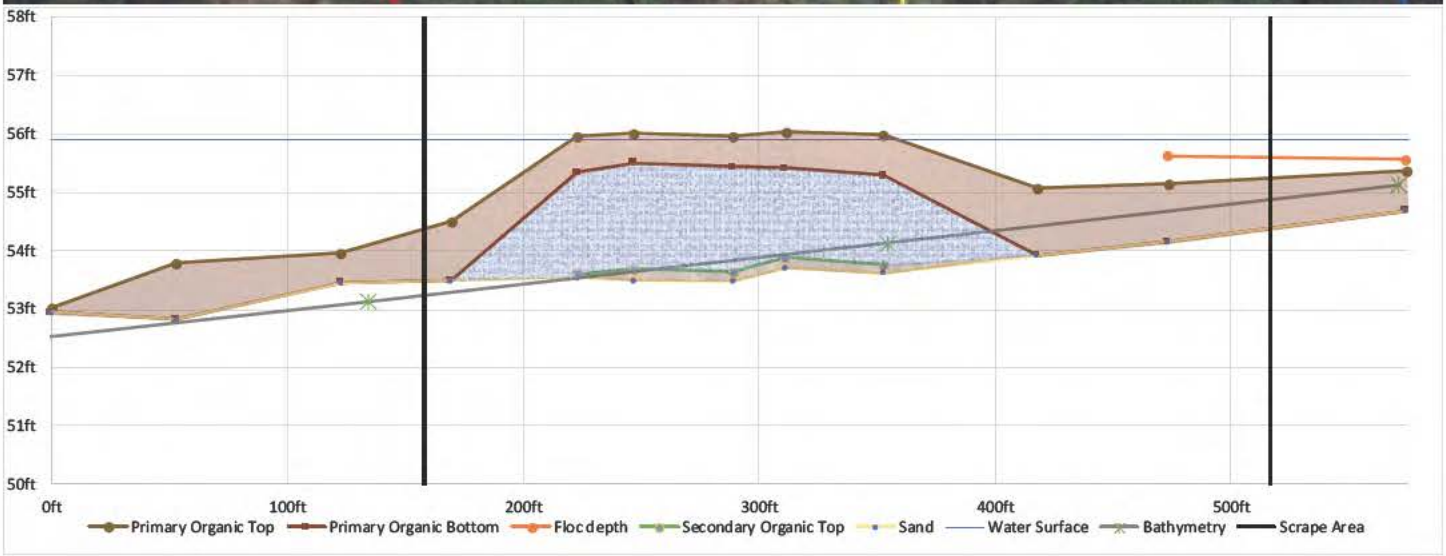
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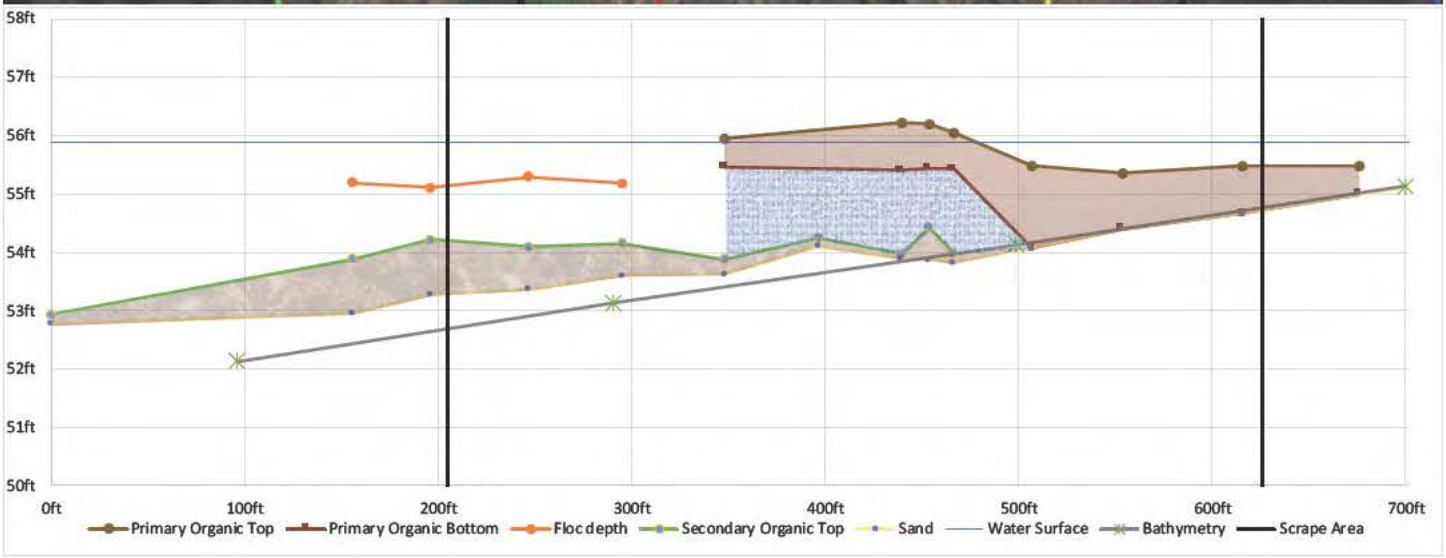
53ft
52ft
51ft
50ft
0ft
100ft
200ft
300ft
400ft
500ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T7E

N
0 25 50 100 Feet

N
0 25 50 100 Feet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57ft
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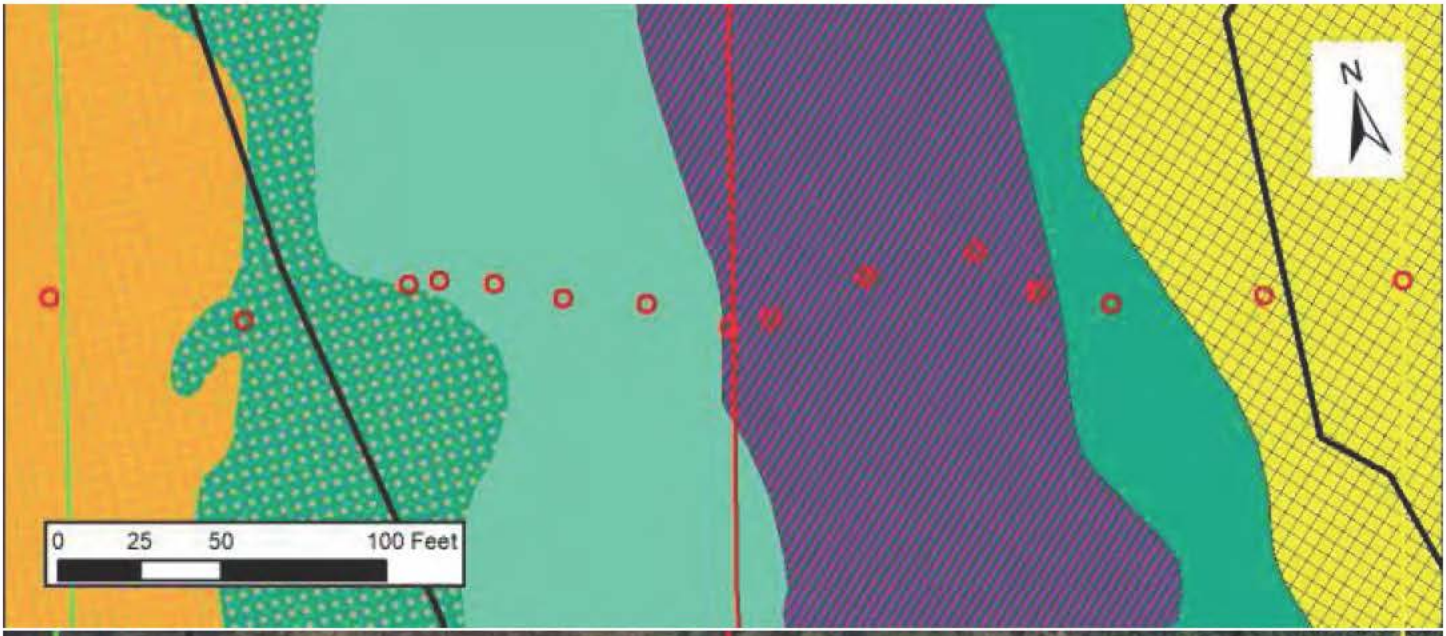
52ft
51ft
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area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N
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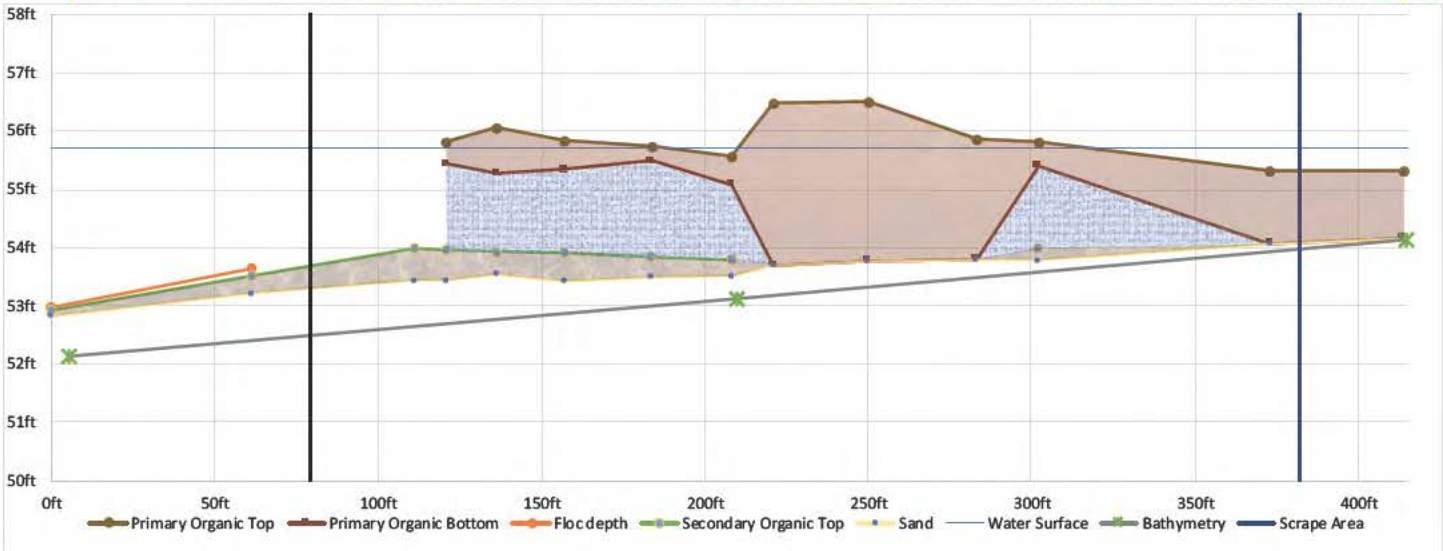
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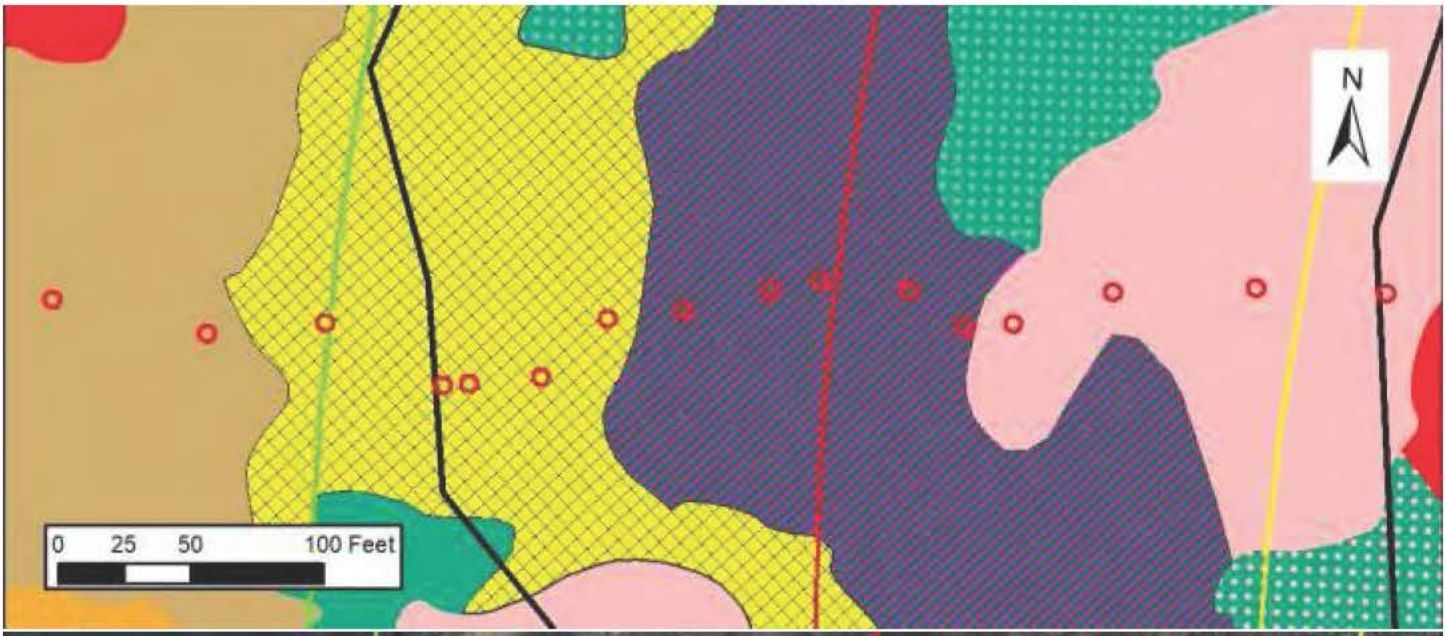
53ft
52ft
51ft
50ft
0ft
50ft
100ft
150ft
200ft
250ft
300ft
350ft
400ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T9E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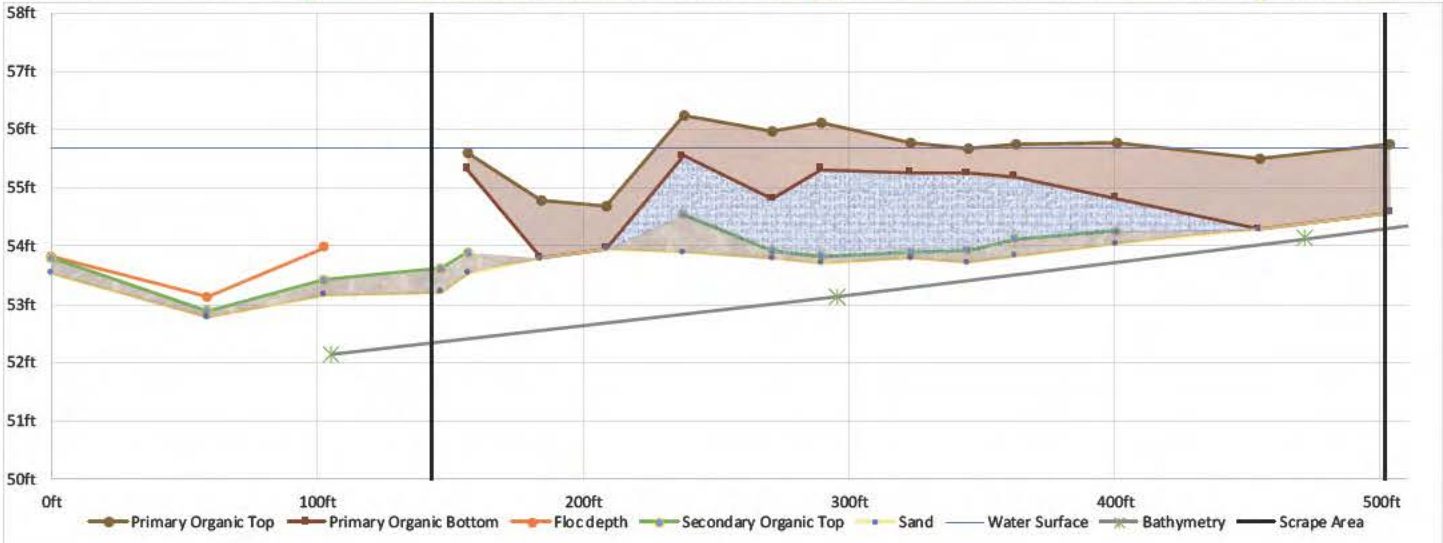
N
0 25 50 100 Feet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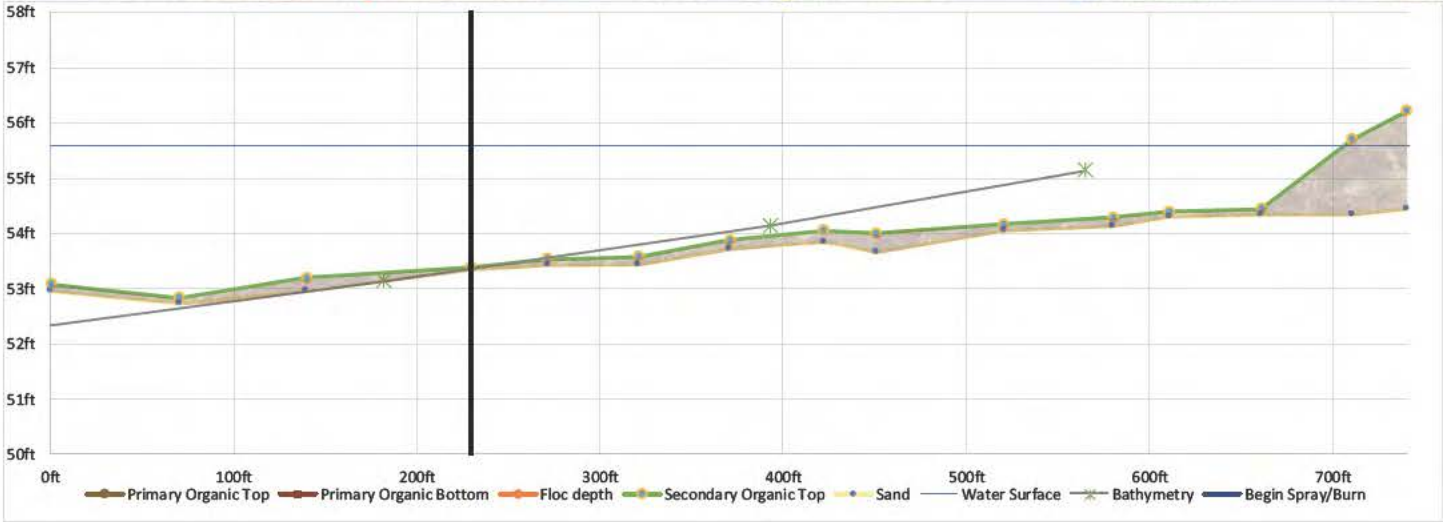
50ft
0ft
100ft
200ft
300ft
400ft
500ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T10N

N
0 25 50 100 Feet

N
0 25 50 100 Feet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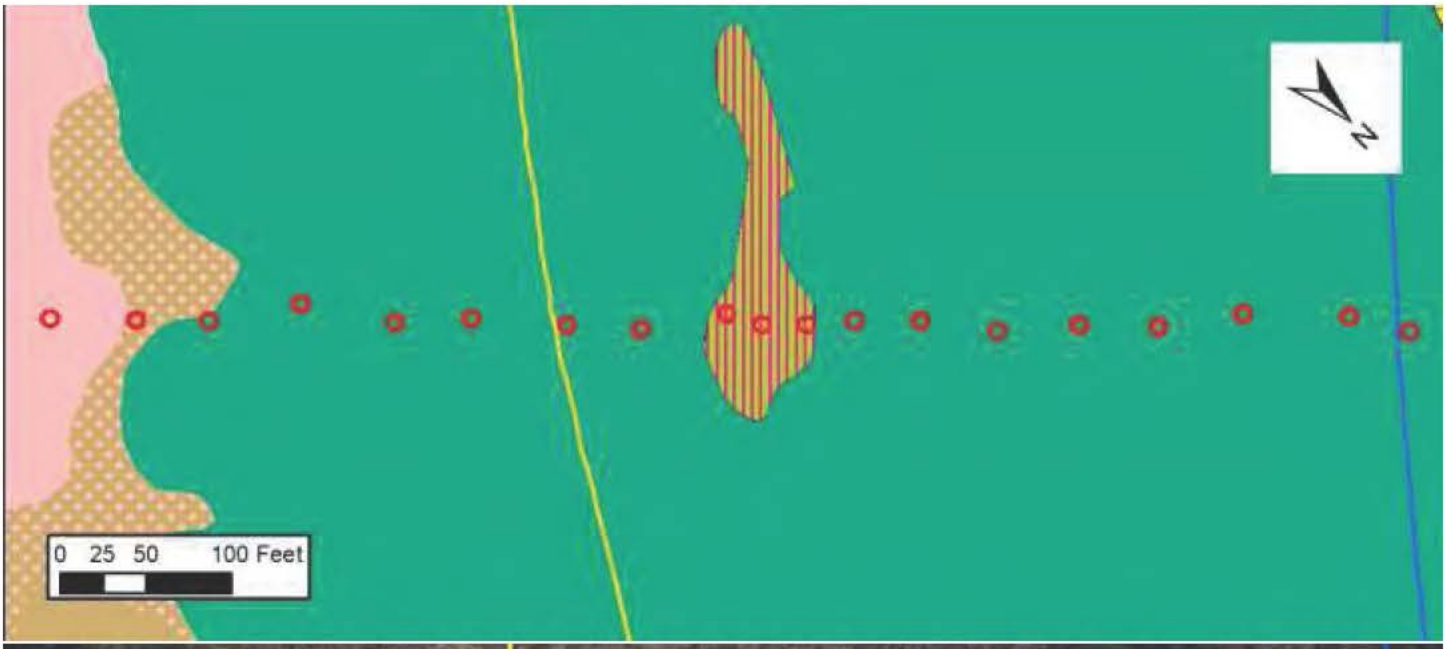
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Begin Spray/Burn

T11W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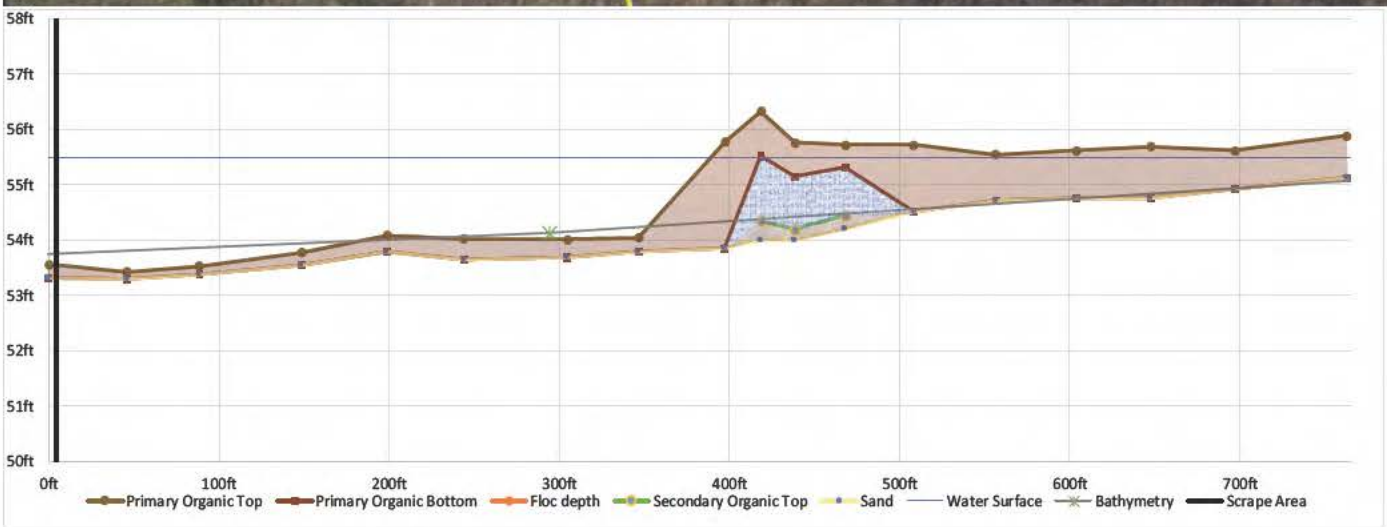
N
0 25 50 100 Feet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52ft
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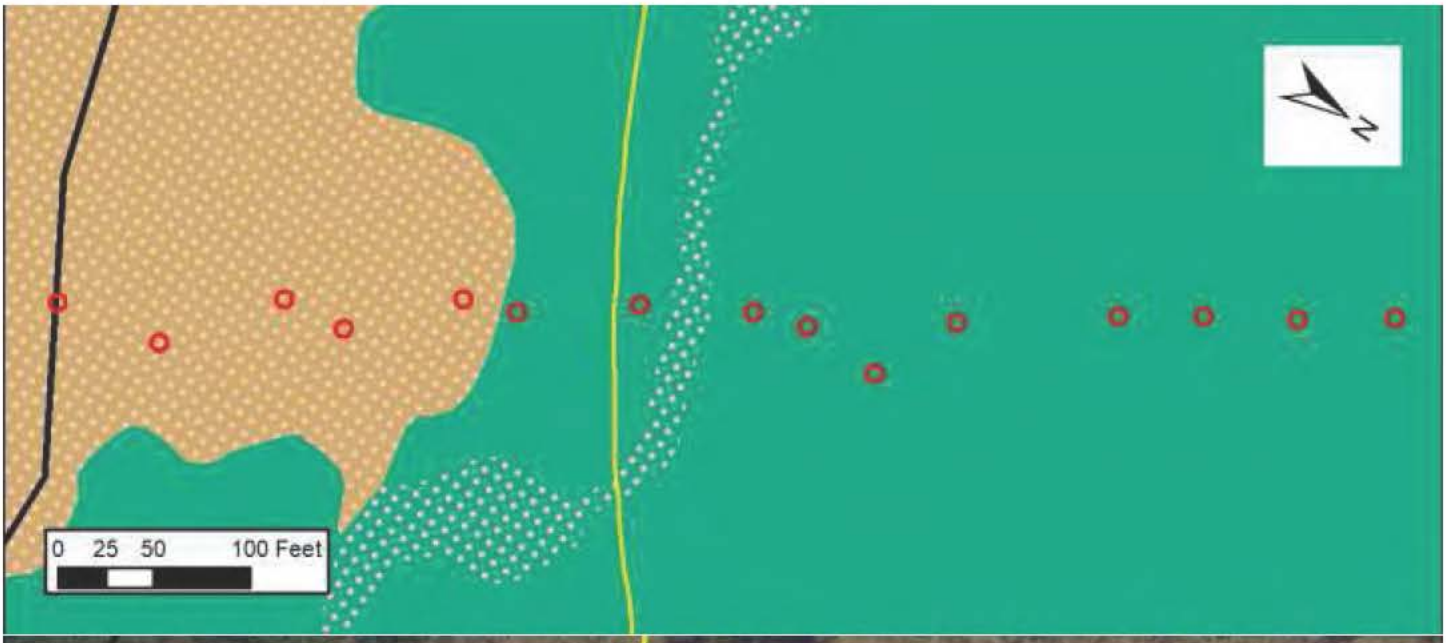
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T12W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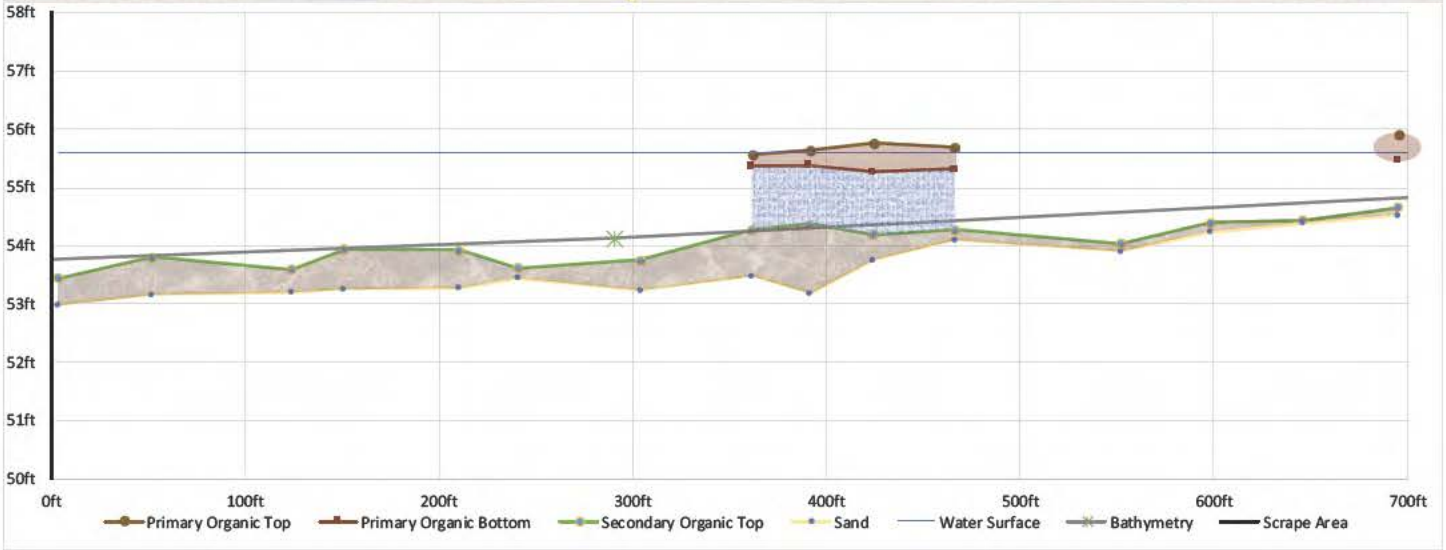
N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57ft
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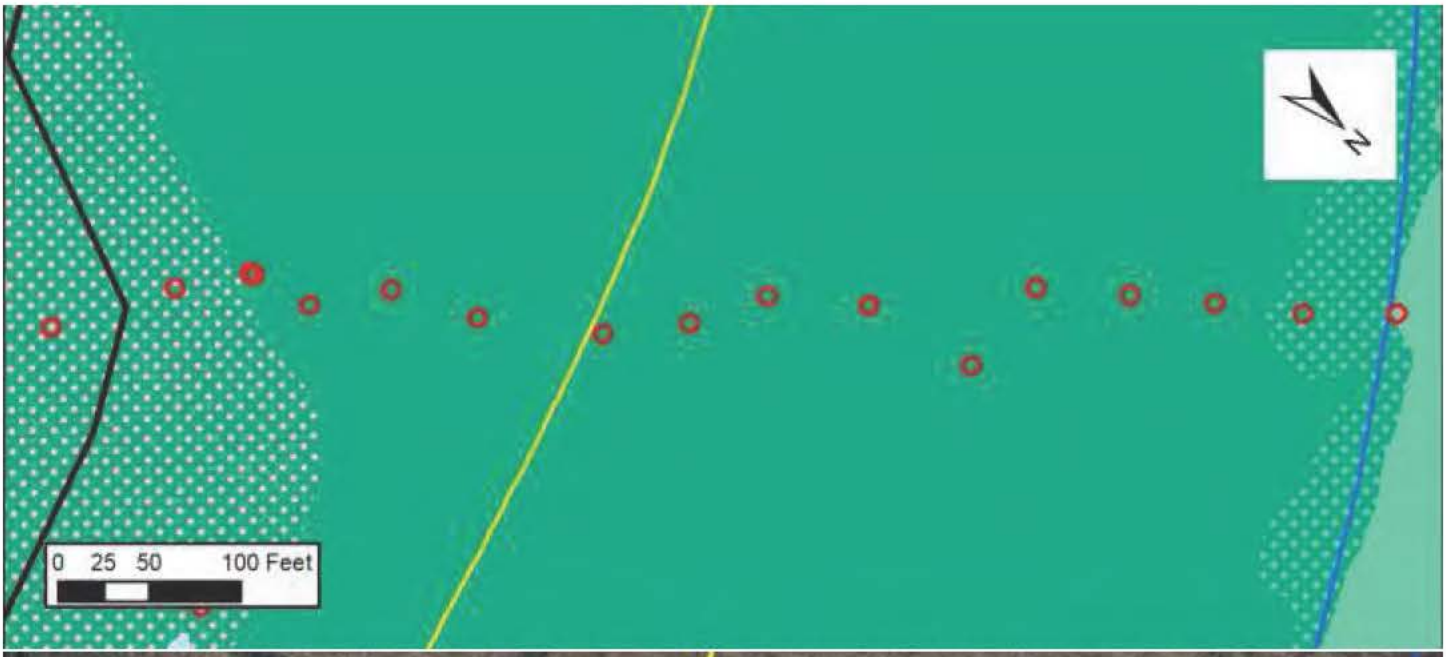
52ft
51ft
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T13W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0 25 50 100 Feet
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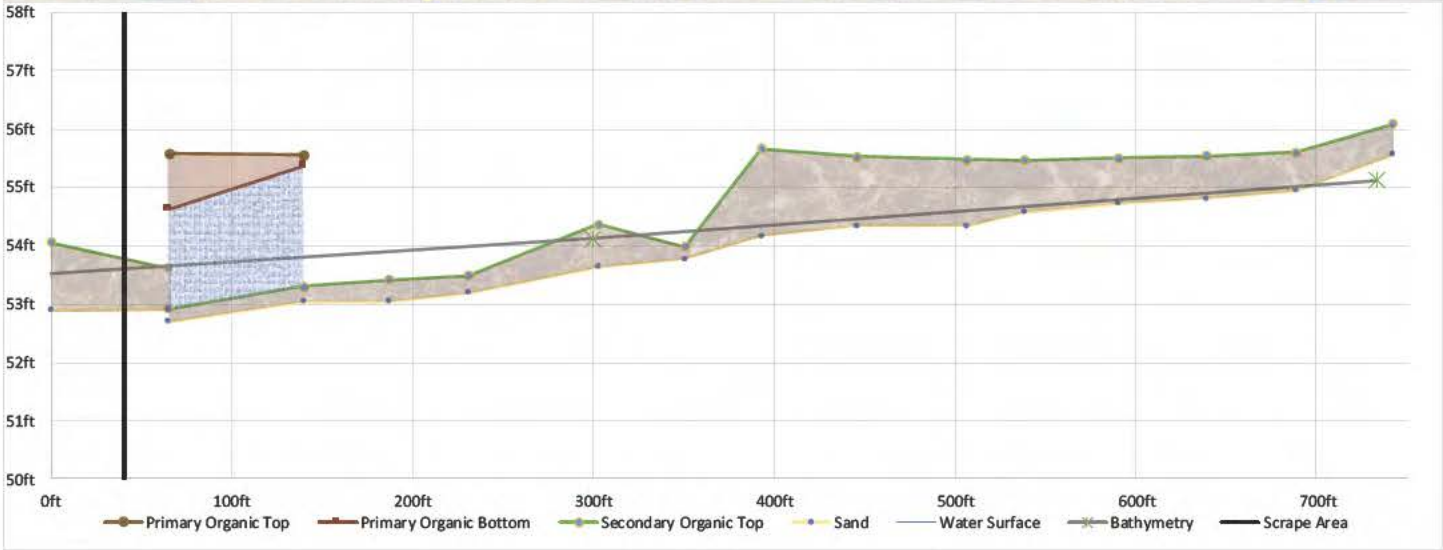
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53ft
52ft
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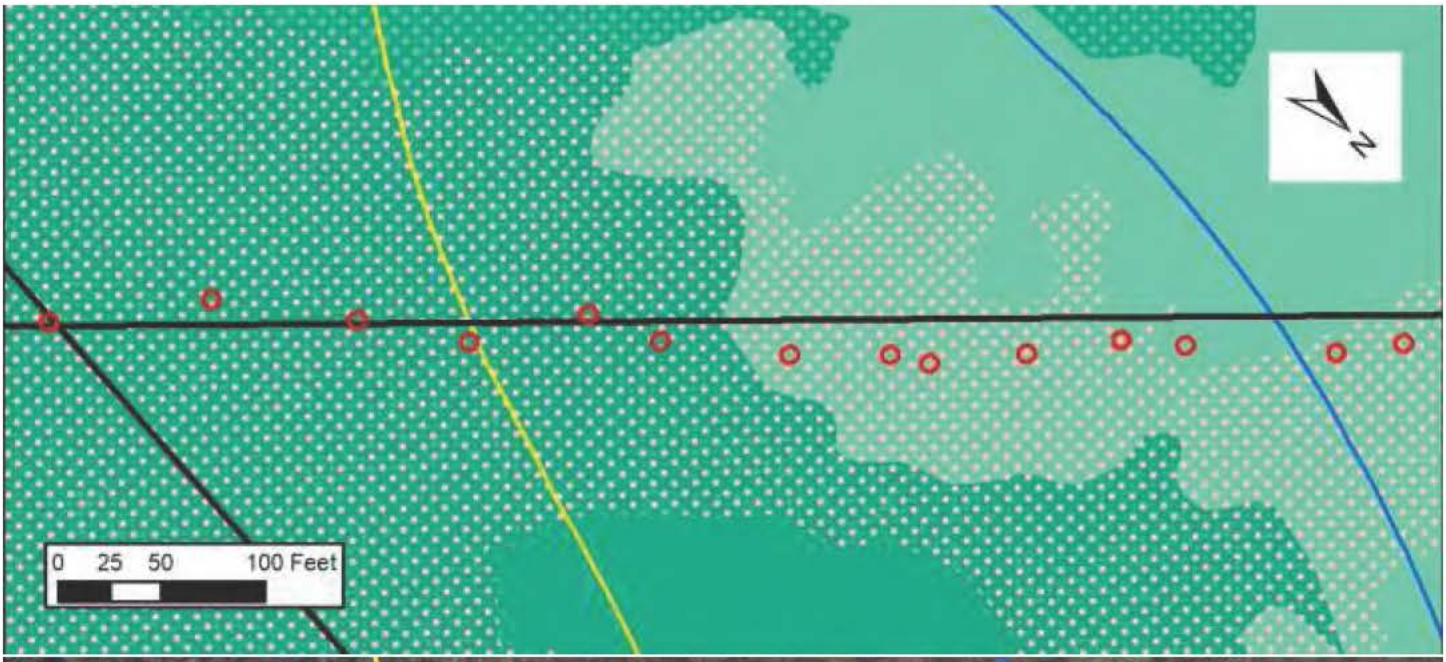
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T14W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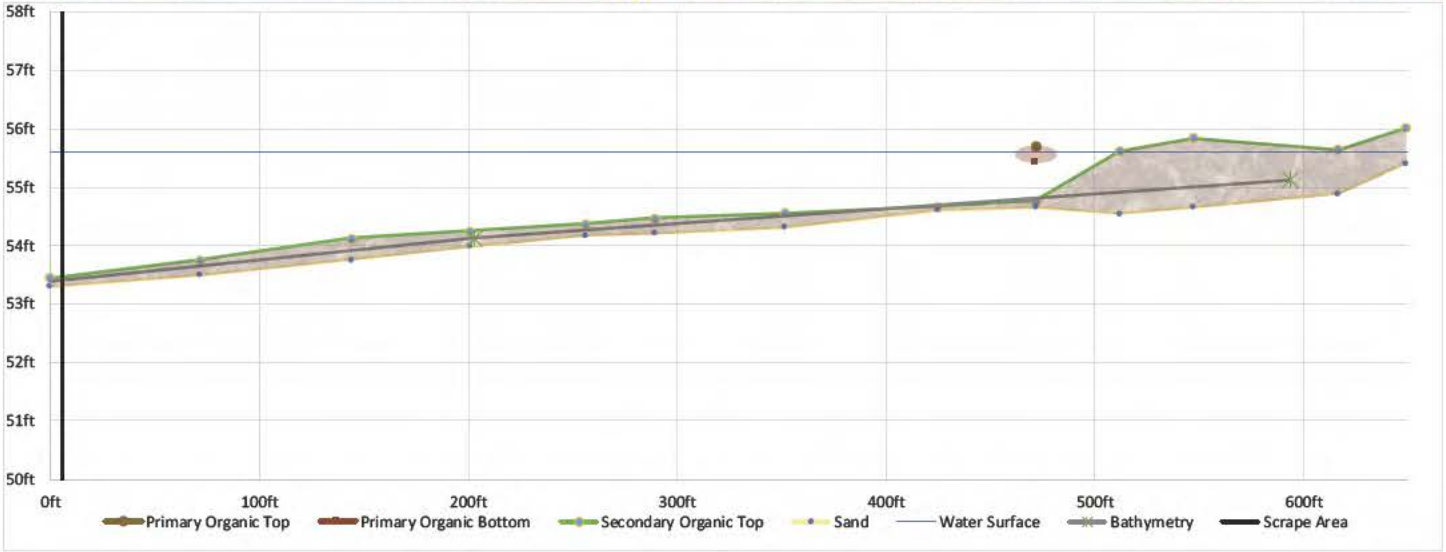
0 25 50 100 Feet

N
0 25 50 100 Feet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57ft
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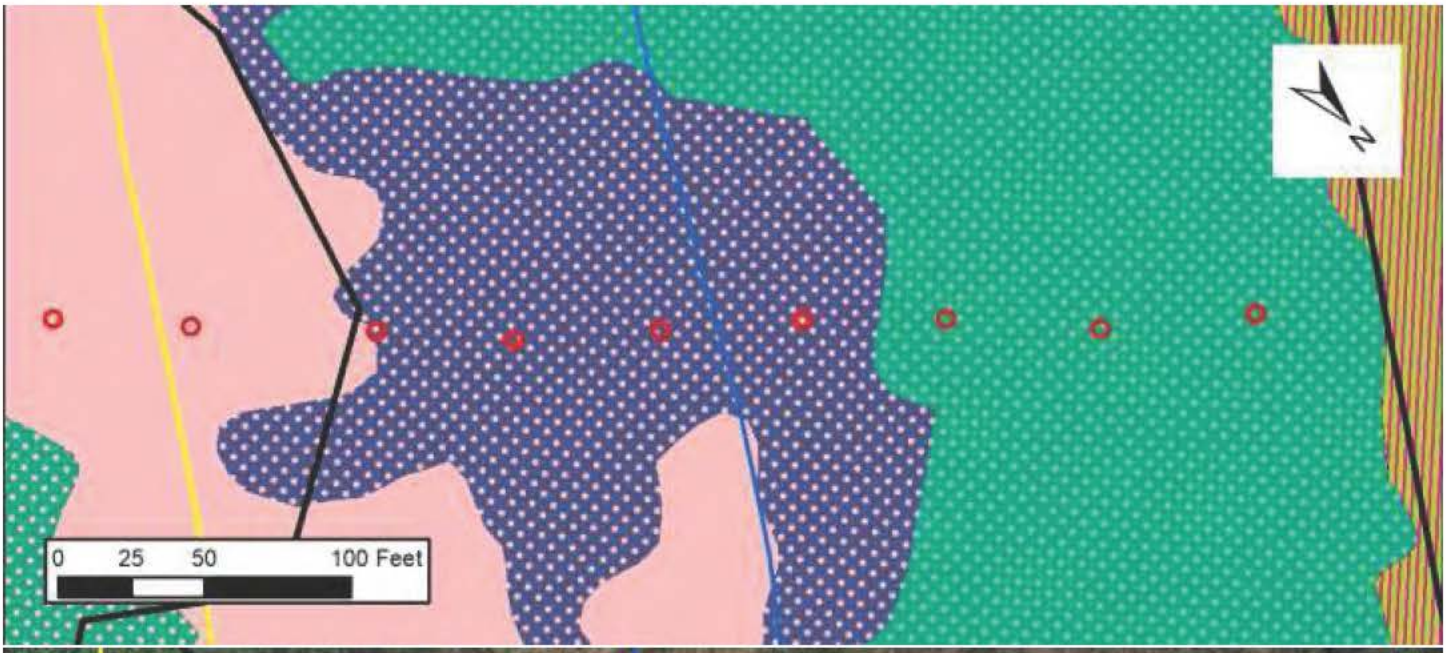
52ft
51ft
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
Primary Organic Top
Primary Organic Bottom
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T15W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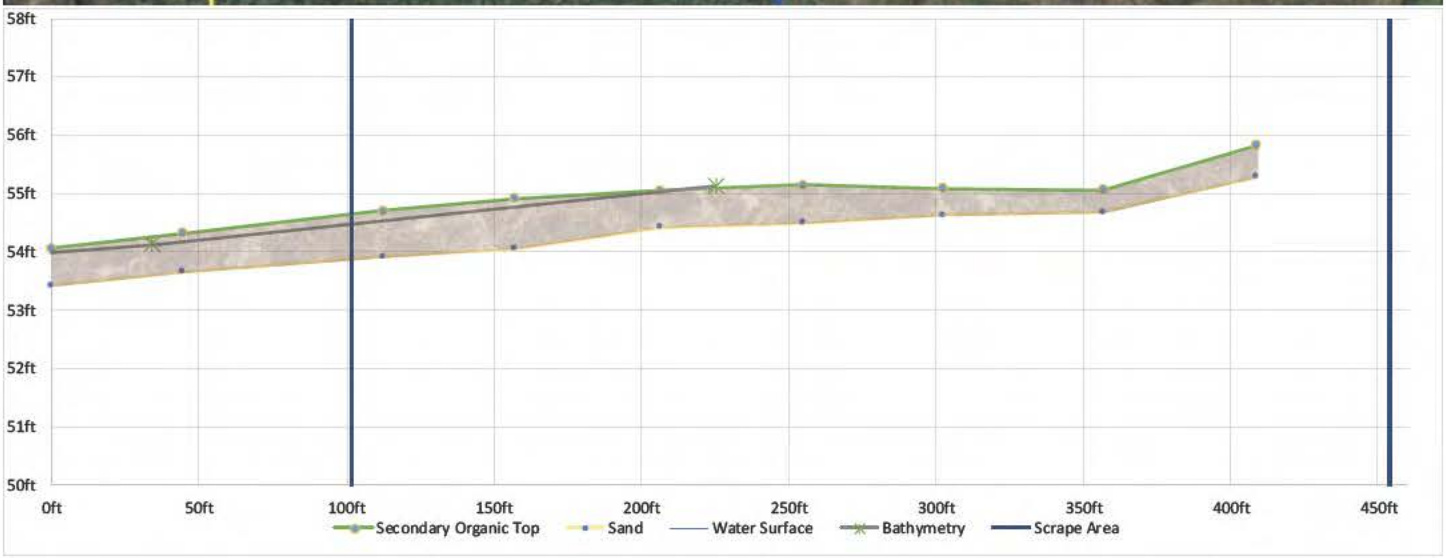
N

0 25 50 100 Feet
N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54ft
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52ft
51ft
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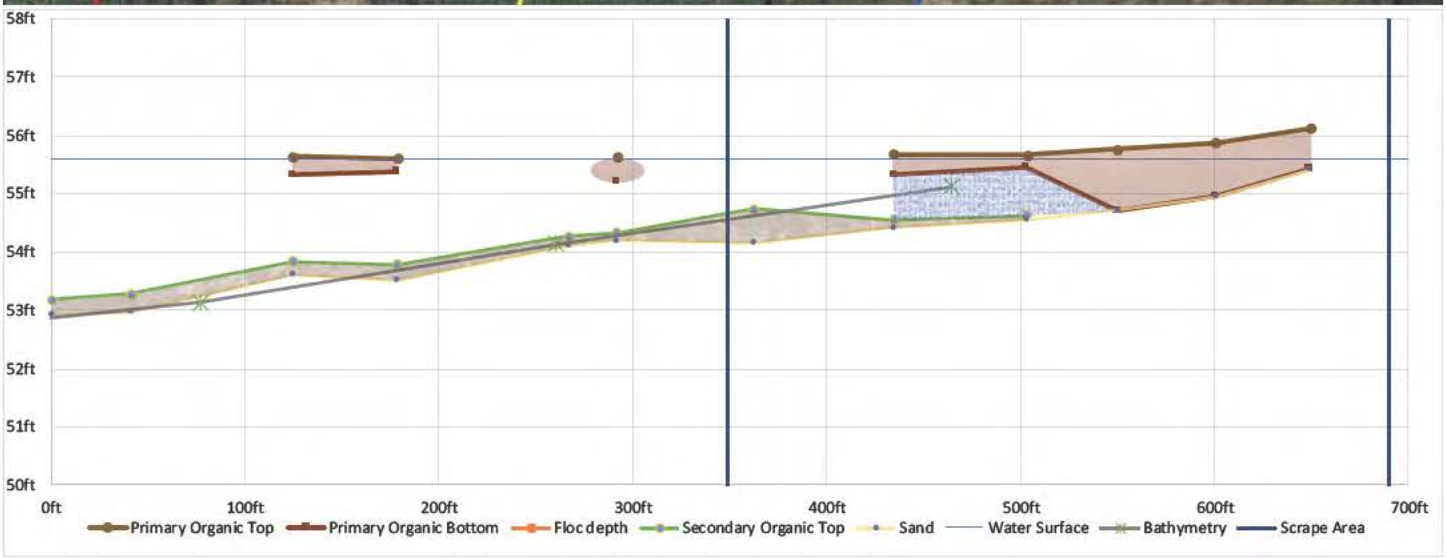
0ft
50ft
100ft
150ft
200ft
250ft
300ft
350ft
400ft
450ft
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

T16W

N
0 25 50 100 Feet

N
0 25 50 100 Feet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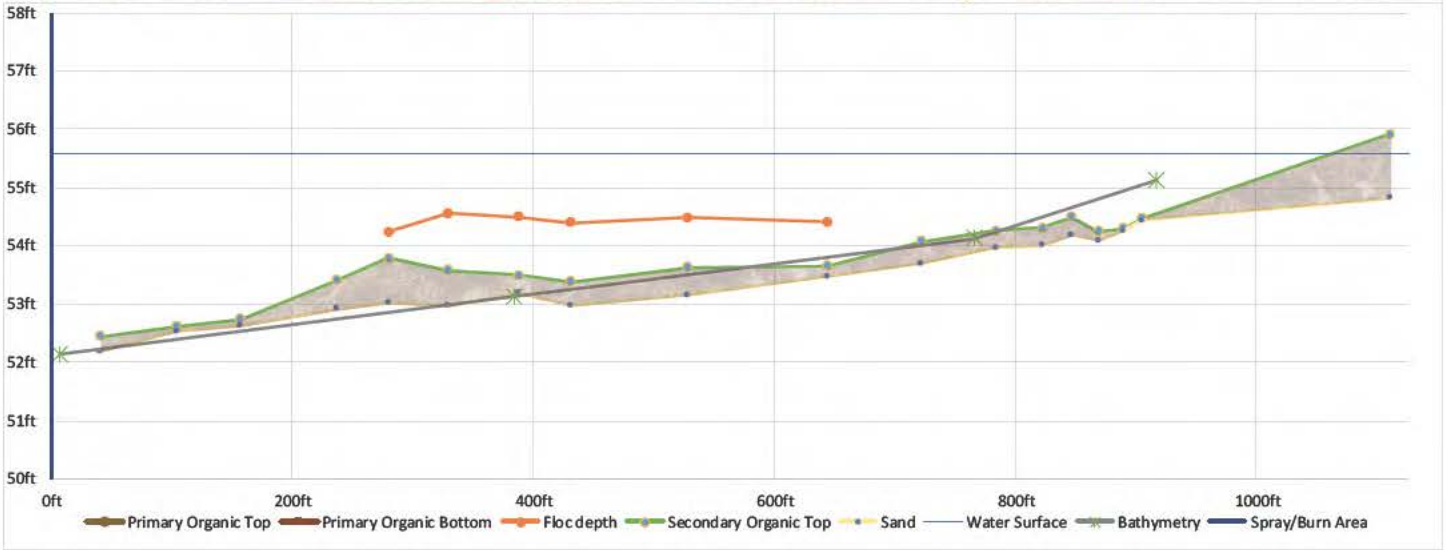
57ft
56ft
55ft
54ft
53ft
52ft
51ft
50ft
0ft
100ft
200ft
300ft
400ft
500ft
600ft
700ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Scrape Area

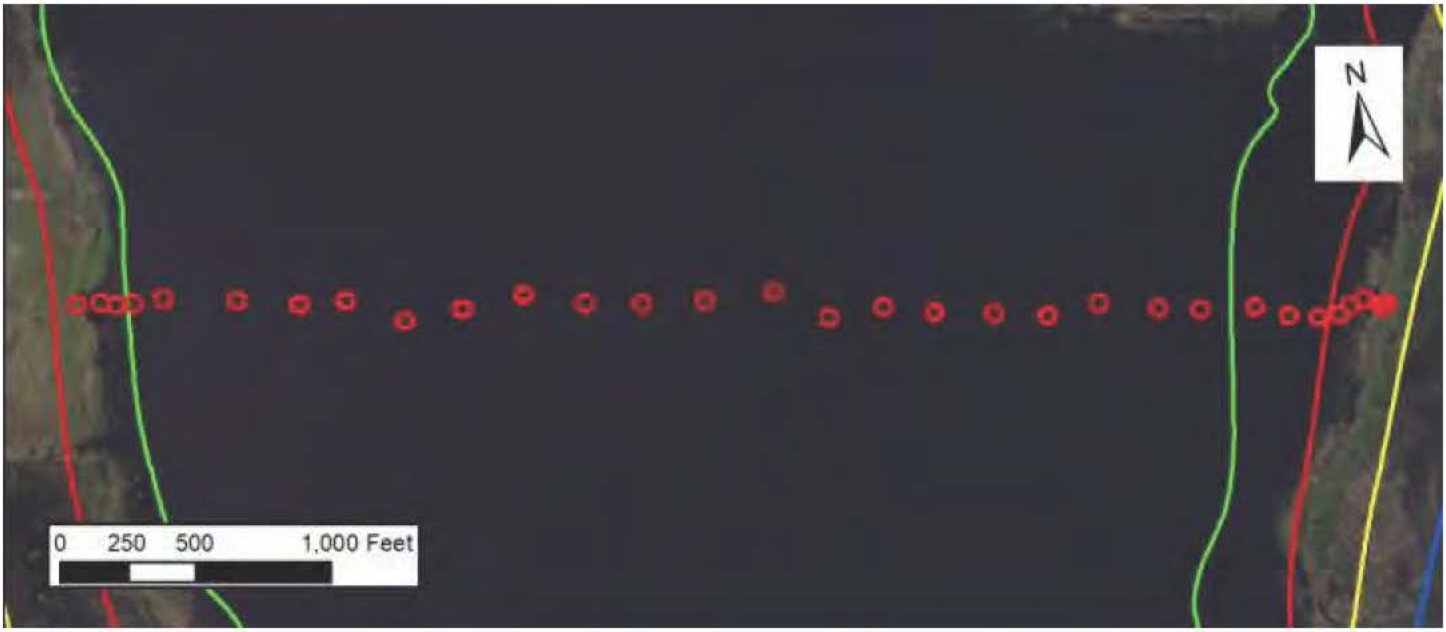
T17W

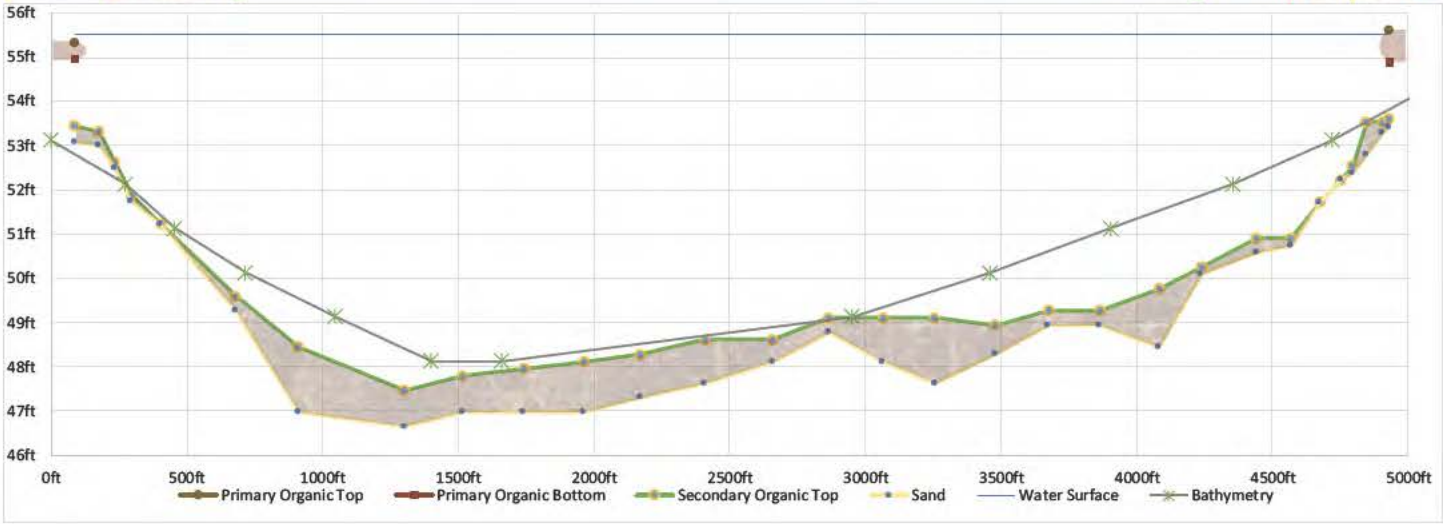
N
0 25 50 100 Feet

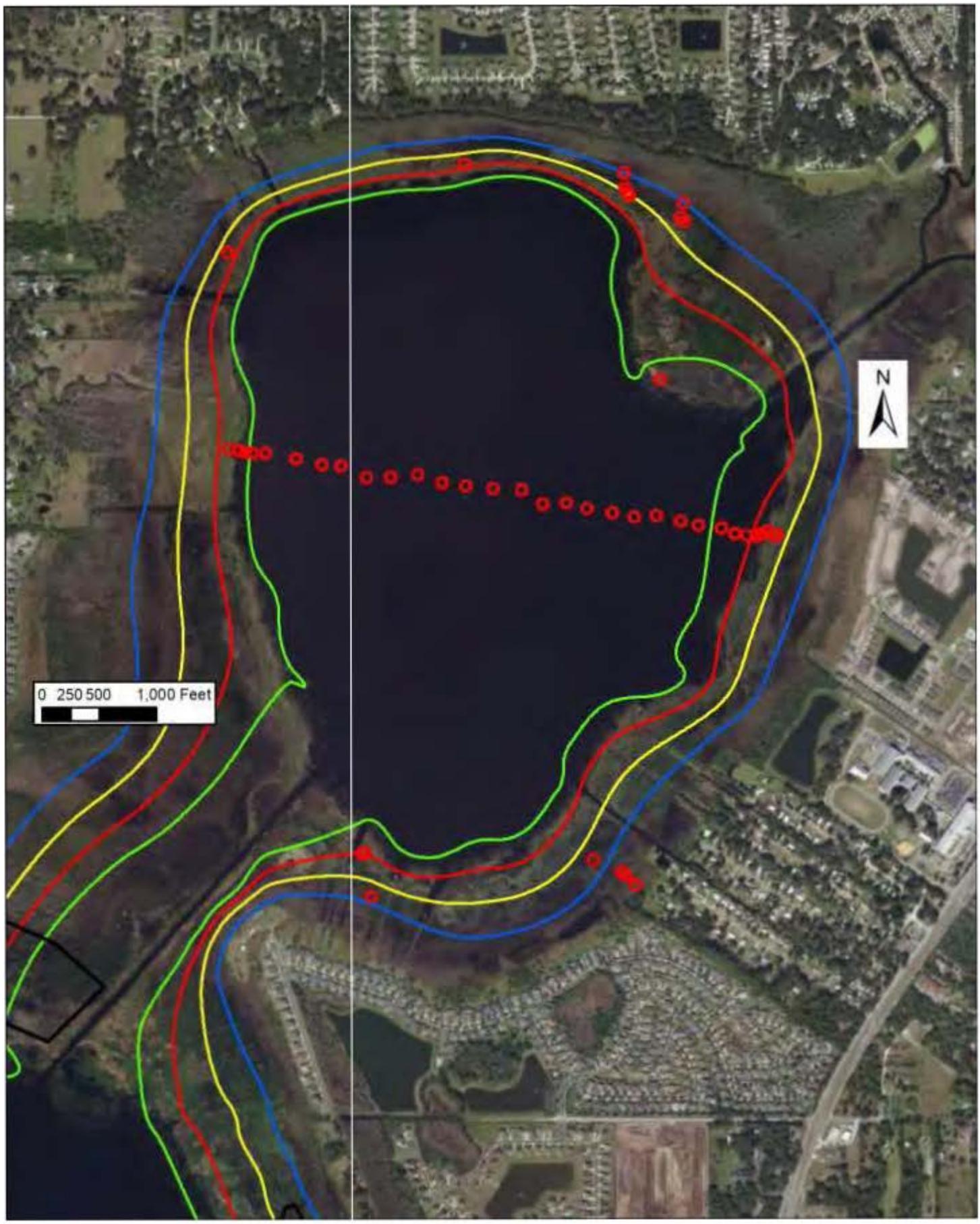
N
0 25 50 100 Feet


58ft
57ft
56ft
55ft
54ft
53ft
52ft
51ft
50ft
0ft
200ft
400ft
600ft
800ft
1000ft
Primary Organic Top
Primary Organic Bottom
Floc depth
Secondary Organic Top
Sand
Water Surface
Bathymetry
Spray/Burn Area

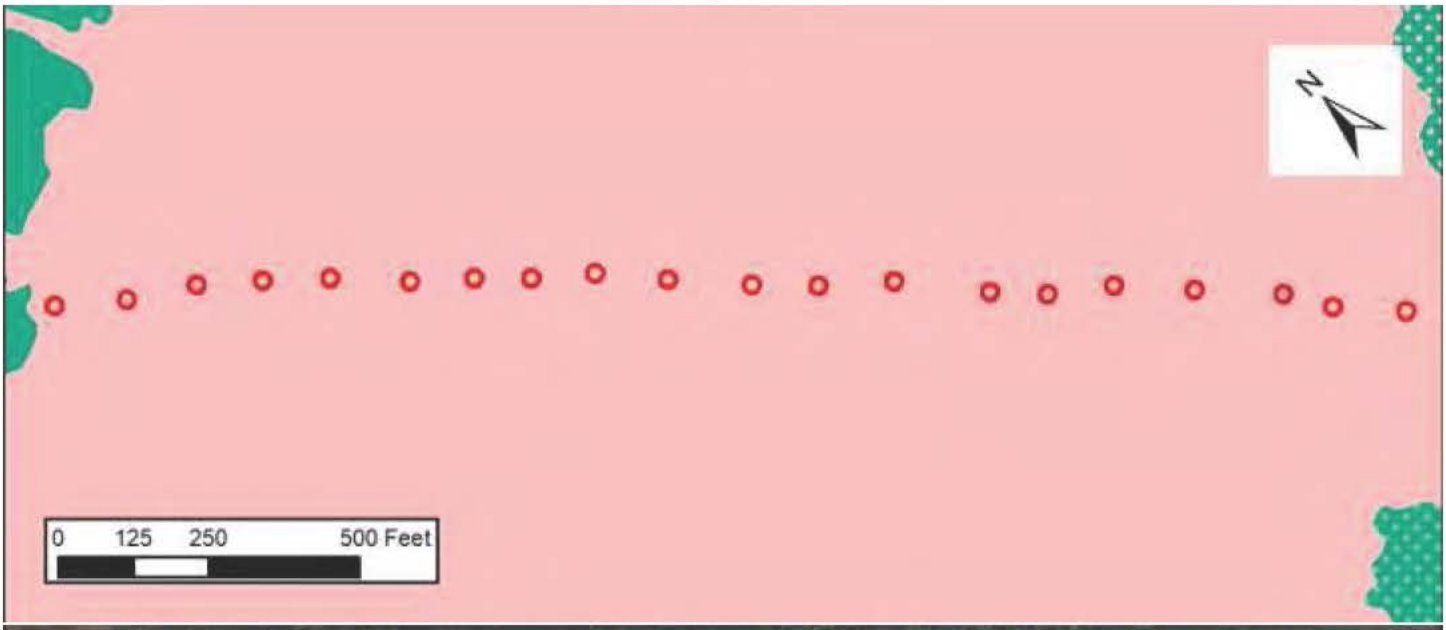
Fells Cove Transect






N
0 250 500 1,000 Feet

Runnymede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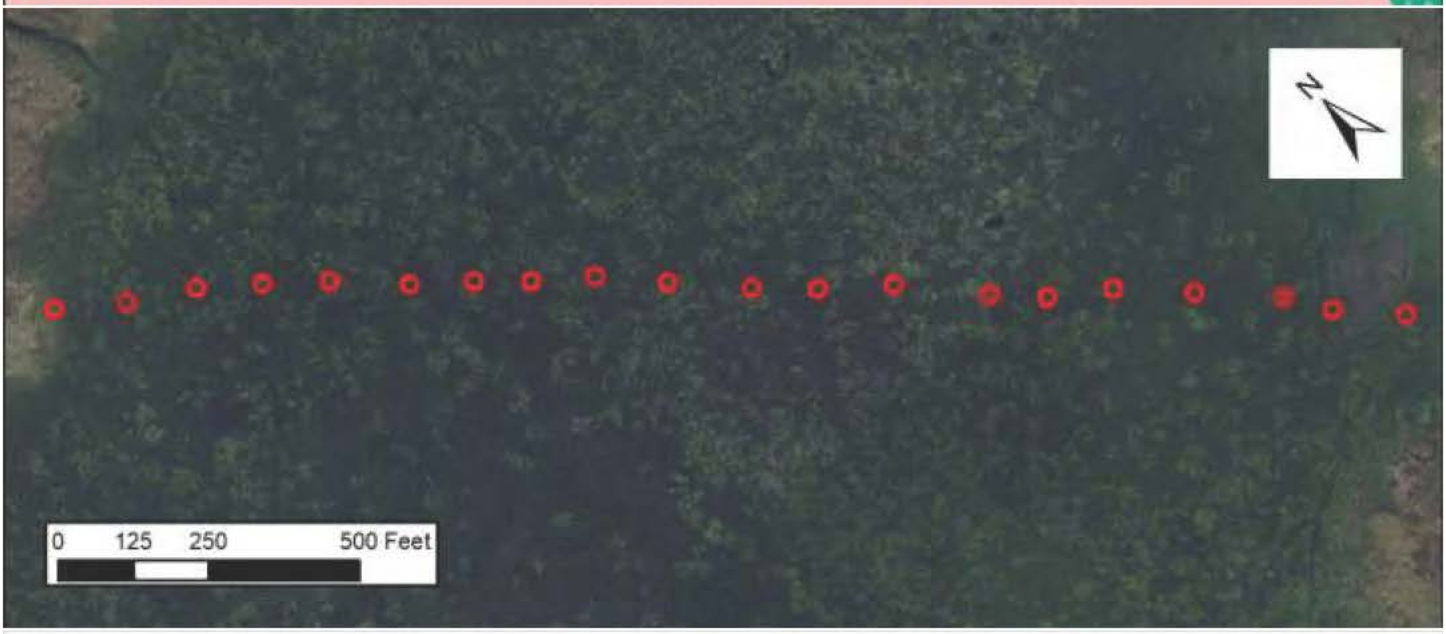
0 125 250 500 Feet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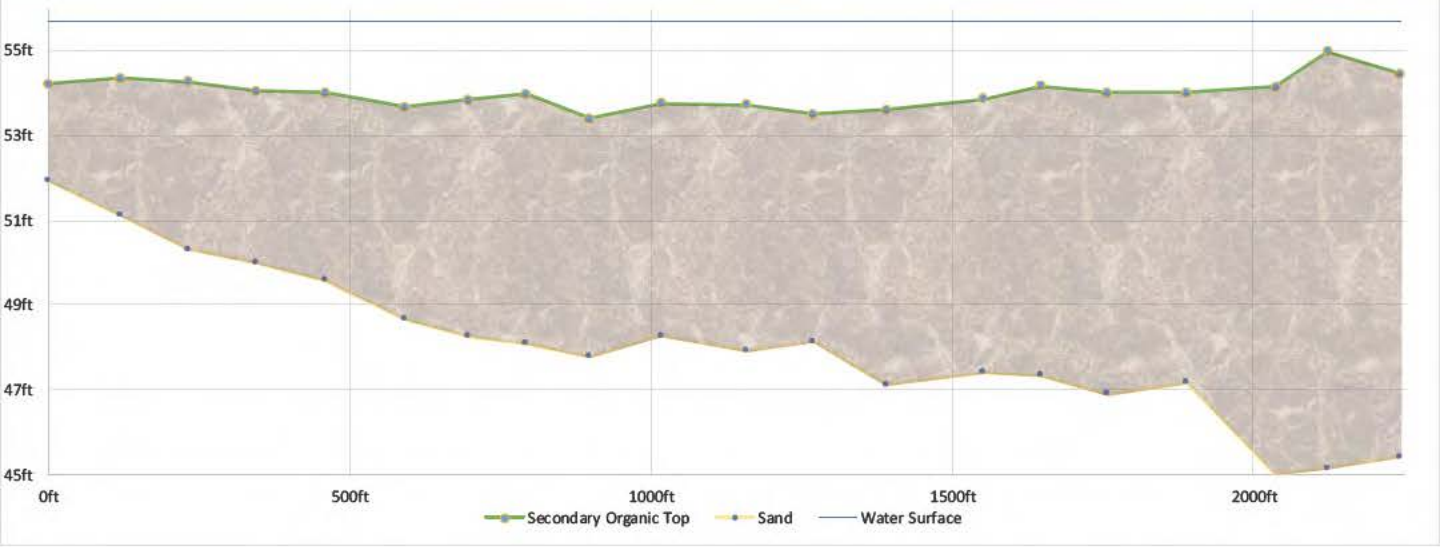
0 125 250 500 Feet


55ft
53ft
51ft
49ft
47ft
45ft
0ft
500ft
1000ft
1500ft
2000ft
Secondary Organic Top
Sand
Water Surface

N
0 250 500 1,000 Feet

APPENDIX 2
ELECTRONIC FILE WITH ALL TRANSCRIBED FIELD DATA

APPENDIX 3
AEL LABS RAW DELIVERABLE FILES FOR NUTRIENTS AND CONTAMINANTS

Advanced Environmental Laboratories, Inc
10200 USA Today Way Miramar, FL 33025
Payments: P.O. Box 551580 Jacksonville, FL 32255-1580
Phone: (954)889-2288
Fax: (954)889-2281

May 18, 2018

Andrew Gottlieb
South Florida Engineering & Consultants
30 South M Street
Lake Worth, FL 33460

RE: Workorder: M1801751 Nutrient Contamniants

Dear Andrew Gottlieb:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, April 27, 2018. 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,

Tiffany Mackie

Tiffany Mackie - Client Services Manager
TMackie@AELLab.com

Enclosures

CERTIFICATE OF ANALYSIS

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10200 USA Today Way Miramar, FL 33025
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Phone: (954)889-2288
Fax: (954)889-2281

SAMPLE SUMMARY

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Matrix	Date Collected	Date Received
M1801751001	552 Cattail Fibrous Root	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751002	553 Pont Tussock	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751003	555 Myrian Root Fiber + Pont	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751004	558 Ponts Root Fiber/loose muc	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751005	560 BR Fibrous Root/Loose Muck	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751006	563 Tussock MWS Root F ber/loo	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751007	564 Tussock root fiber/muck	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751008	566 Tussock Root Fiber/Muck	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751009	568 Nym/Pads Loose Muck W/Fibe	Soil	4/16/2018 00:00	4/27/2018 12:16
M1801751010	602 NymCat Brown H2O With Root	Soil	4/17/2018 00:00	4/27/2018 12:16
M1801751011	606 Pontus Brown H2O & Roots	Soil	4/17/2018 00:00	4/27/2018 12:16
M1801751012	609/611 Island Thhick Muck,roo	Soil	4/17/2018 00:00	4/27/2018 12:16
M1801751013	613 Typont Wet,mucky,f brous	Soil	4/17/2018 00:00	4/27/2018 12:16
M1801751014	618 Pad marsh Mostly solid	Soil	4/17/2018 00:00	4/27/2018 12:16

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3004.1.0.0

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Phone: (954)889-2288
Fax: (954)889-2281

ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751001** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **552 Cattail Fibrous Root** Date Collected: 04/16/18 00:00

Results for sample M1801751001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.017**	**U,Q**	**mg/Kg**	**1**	0.068	0.017	5/3/2018 20:52	M
Phenanthrene	**0.017**	**U,Q**	**mg/Kg**	**1**	0.068	0.017	5/3/2018 20:52	M
Nitrobenzene-d5 (S)	**92**		**%**	**1**	33-134		5/3/2018 20:52	
2-Fluorobiphenyl (S)	**74**		**%**	**1**	37-127		5/3/2018 20:52	
p-Terphenyl-d14 (S)	**91**		**%**	**1**	42-141		5/3/2018 20:52	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**3700**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:16	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**3700**		**mg/Kg**	**10**	2100	1700	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**520**	**U**	**mg/Kg**	**10**	540	520	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**20**	**U**	**mg/Kg**	**5**	200	20	5/2/2018 22:22	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**120000**		**mg/Kg**	**1**			5/8/2018 11:55	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**88**		**%**	**1**			5/7/2018 11:34	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751002** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **553 Pont Tussock** Date Collected: 04/16/18 00:00

Results for sample M1801751002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.89**	**U,Q**	**mg/Kg**	**5**	3.6	0.89	5/3/2018 21:18	M
Phenanthrene	**0.91**	**U,Q**	**mg/Kg**	**5**	3.6	0.91	5/3/2018 21:18	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/3/2018 21:18	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/3/2018 21:18	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/3/2018 21:18	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**33000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:16	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**33000**		**mg/Kg**	**10**	16000	13000	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**3900**	**U**	**mg/Kg**	**10**	4000	3900	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**210**	**U**	**mg/Kg**	**5**	2100	210	5/2/2018 22:42	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**11000**		**mg/Kg**	**1**			5/8/2018 11:55	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**99**		**%**	**1**			5/7/2018 11:34	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751003** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **555 Myrian Root Fiber + Pont** Date Collected: 04/16/18 00:00

Results for sample M1801751003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.069**	**U,Q**	**mg/Kg**	**5**	0.28	0.069	5/3/2018 21:45	M
Phenanthrene	**0.071**	**U,Q**	**mg/Kg**	**5**	0.28	0.071	5/3/2018 21:45	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/3/2018 21:45	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/3/2018 21:45	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/3/2018 21:45	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**19000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:16	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**19000**		**mg/Kg**	**10**	2500	2000	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**610**	**U**	**mg/Kg**	**10**	630	610	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**17**	**U**	**mg/Kg**	**5**	170	17	5/2/2018 23:02	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**140000**		**mg/Kg**	**1**			5/8/2018 11:55	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**86**		**%**	**1**			5/7/2018 11:34	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751004** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **558 Ponts Root Fiber/loose muc** Date Collected: 04/16/18 00:00

Results for sample M1801751004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.8**	**U**	**mg/Kg**	**1**	16	2.8	5/7/2018 16:57	M
Arsenic	**3.9**	**I**	**mg/Kg**	**1**	47	3.2	5/7/2018 16:57	M
Beryllium	**0.18**	**U**	**mg/Kg**	**1**	1.6	0.18	5/7/2018 16:57	M
Cadmium	**0.26**	**U**	**mg/Kg**	**1**	7.8	0.26	5/7/2018 16:57	M
Chromium	**7.0**	**I**	**mg/Kg**	**1**	7.8	5.6	5/7/2018 16:57	M
Copper	**16**	**I**	**mg/Kg**	**1**	160	4.6	5/7/2018 16:57	M
Lead	**9.5**	**I**	**mg/Kg**	**1**	16	1.6	5/7/2018 16:57	M
Nickel	**4.5**	**I**	**mg/Kg**	**1**	78	3.7	5/7/2018 16:57	M
Zinc	**40**	**I**	**mg/Kg**	**1**	78	12	5/7/2018 16:57	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.12**	**I**	**mg/Kg**	**1**	0.17	0.023	5/10/2018 12:41	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.066**	**U,Q**	**mg/Kg**	**1**	0.27	0.066	5/3/2018 22:12	M
Phenanthrene	**0.068**	**U,Q**	**mg/Kg**	**1**	0.27	0.068	5/3/2018 22:12	M
Nitrobenzene-d5 (S)	**102**		**%**	**1**	33-134		5/3/2018 22:12	
2-Fluorobiphenyl (S)	**79**		**%**	**1**	37-127		5/3/2018 22:12	
p-Terphenyl-d14 (S)	**103**		**%**	**1**	42-141		5/3/2018 22:12	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**18000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:16	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**18000**		**mg/Kg**	**10**	6000	4800	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1500**	**U**	**mg/Kg**	**10**	1500	1500	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751004** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **558 Ponts Root Fiber/loose muc** Date Collected: 04/16/18 00:00

Results for sample M1801751004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**320**	I	**mg/Kg**	**5**	850	85	5/2/2018 23:22	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**29000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**97**		**%**	**1**			5/2/2018 12:02	M

Lab ID: **M1801751005** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **560 BR Fibrous Root/Loose Muck** Date Collected: 04/16/18 00:00

Results for sample M1801751005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.11**	U,Q	**mg/Kg**	**1**	0.44	0.11	5/3/2018 22:38	M
Phenanthrene	**0.11**	U,Q	**mg/Kg**	**1**	0.44	0.11	5/3/2018 22:38	M
Nitrobenzene-d5 (S)	**87**		**%**	**1**	33-134		5/3/2018 22:38	
2-Fluorobiphenyl (S)	**68**		**%**	**1**	37-127		5/3/2018 22:38	
p-Terphenyl-d14 (S)	**92**		**%**	**1**	42-141		5/3/2018 22:38	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**31000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:16	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**31000**		**mg/Kg**	**10**	8100	6500	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751005** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **560 BR Fibrous Root/Loose Muck** Date Collected: 04/16/18 00:00

Results for sample M1801751005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1900**	**U**	**mg/Kg**	**10**	2000	1900	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**140**	**U**	**mg/Kg**	**5**	1400	140	5/2/2018 23:42	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**18000**		**mg/Kg**	**1**			5/8/2018 11:55	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**98**		**%**	**1**			5/7/2018 11:34	M

Lab ID: **M1801751006** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **563 Tussock MWS Root Fiber/loo** Date Collected: 04/16/18 00:00

Results for sample M1801751006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.5**	**U**	**mg/Kg**	**1**	14	2.5	5/7/2018 17:17	M
Arsenic	**4.9**	**I**	**mg/Kg**	**1**	42	2.9	5/7/2018 17:17	M
Beryllium	**0.17**	**U**	**mg/Kg**	**1**	1.4	0.17	5/7/2018 17:17	M
Cadmium	**0.24**	**U**	**mg/Kg**	**1**	7.0	0.24	5/7/2018 17:17	M
Chromium	**9.3**		**mg/Kg**	**1**	7.0	5.1	5/7/2018 17:17	M
Copper	**21**	**I**	**mg/Kg**	**1**	140	4.2	5/7/2018 17:17	M
Lead	**12**	**I**	**mg/Kg**	**1**	14	1.5	5/7/2018 17:17	M
Nickel	**5.2**	**I**	**mg/Kg**	**1**	70	3.3	5/7/2018 17:17	M
Zinc	**23**	**I**	**mg/Kg**	**1**	70	11	5/7/2018 17:17	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751006** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **563 Tussock MWS Root Fiber/loo** Date Collected: 04/16/18 00:00

Results for sample M1801751006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.10**	I	**mg/Kg**	**1**	0.13	0.018	5/10/2018 12:56	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.056**	U,Q	**mg/Kg**	**1**	0.22	0.056	5/3/2018 23:04	M
Phenanthrene	**0.057**	U,Q	**mg/Kg**	**1**	0.22	0.057	5/3/2018 23:04	M
Nitrobenzene-d5 (S)	**84**		**%**	**1**	33-134		5/3/2018 23:04	
2-Fluorobiphenyl (S)	**68**		**%**	**1**	37-127		5/3/2018 23:04	
p-Terphenyl-d14 (S)	**87**		**%**	**1**	42-141		5/3/2018 23:04	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**22000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:17	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**22000**		**mg/Kg**	**10**	5300	4300	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1300**	U	**mg/Kg**	**10**	1300	1300	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**71**	U	**mg/Kg**	**5**	710	71	5/3/2018 00:02	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**35000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**97**		**%**	**1**			5/2/2018 12:02	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751007** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **564 Tussock root fiber/muck** Date Collected: 04/16/18 00:00

Results for sample M1801751007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.8**	**U**	**mg/Kg**	**1**	10	1.8	5/7/2018 17:20	M
Arsenic	**4.4**	**I**	**mg/Kg**	**1**	30	2.1	5/7/2018 17:20	M
Beryllium	**0.12**	**U**	**mg/Kg**	**1**	1.0	0.12	5/7/2018 17:20	M
Cadmium	**0.30**	**I**	**mg/Kg**	**1**	5.0	0.17	5/7/2018 17:20	M
Chromium	**9.5**		**mg/Kg**	**1**	5.0	3.6	5/7/2018 17:20	M
Copper	**26**	**I**	**mg/Kg**	**1**	100	3.0	5/7/2018 17:20	M
Lead	**14**		**mg/Kg**	**1**	10	1.0	5/7/2018 17:20	M
Nickel	**5.8**	**I**	**mg/Kg**	**1**	50	2.4	5/7/2018 17:20	M
Zinc	**32**	**I**	**mg/Kg**	**1**	50	7.9	5/7/2018 17:20	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.095**	**I**	**mg/Kg**	**1**	0.095	0.013	5/10/2018 12:59	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.038**	**U,Q**	**mg/Kg**	**1**	0.15	0.038	5/3/2018 23:31	M
Phenanthrene	**0.039**	**U,Q**	**mg/Kg**	**1**	0.15	0.039	5/3/2018 23:31	M
Nitrobenzene-d5 (S)	**85**		**%**	**1**	33-134		5/3/2018 23:31	
2-Fluorobiphenyl (S)	**67**		**%**	**1**	37-127		5/3/2018 23:31	
p-Terphenyl-d14 (S)	**88**		**%**	**1**	42-141		5/3/2018 23:31	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**20000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:17	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**20000**		**mg/Kg**	**10**	2300	1900	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**560**	**U**	**mg/Kg**	**10**	590	560	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751007** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **564 Tussock root fiber/muck** Date Collected: 04/16/18 00:00

Results for sample M1801751007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**43**	**U,J4**	**mg/Kg**	**5**	430	43	5/3/2018 00:22	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**51000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**95**		**%**	**1**			5/2/2018 12:02	M

Lab ID: **M1801751008** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **566 Tussock Root Fiber/Muck** Date Collected: 04/16/18 00:00

Results for sample M1801751008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.4**	**U**	**mg/Kg**	**1**	7.7	1.4	5/7/2018 17:24	M
Arsenic	**2.8**	**I**	**mg/Kg**	**1**	23	1.6	5/7/2018 17:24	M
Beryllium	**0.15**	**I**	**mg/Kg**	**1**	0.77	0.091	5/7/2018 17:24	M
Cadmium	**0.15**	**I**	**mg/Kg**	**1**	3.8	0.13	5/7/2018 17:24	M
Chromium	**5.8**		**mg/Kg**	**1**	3.8	2.8	5/7/2018 17:24	M
Copper	**23**	**I**	**mg/Kg**	**1**	77	2.3	5/7/2018 17:24	M
Lead	**5.5**	**I**	**mg/Kg**	**1**	7.7	0.81	5/7/2018 17:24	M
Nickel	**6.4**	**I**	**mg/Kg**	**1**	38	1.8	5/7/2018 17:24	M
Zinc	**40**		**mg/Kg**	**1**	38	6.1	5/7/2018 17:24	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.091**		**mg/Kg**	**1**	0.077	0.011	5/10/2018 13:02	J
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751008** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **566 Tussock Root Fiber/Muck** Date Collected: 04/16/18 00:00

Results for sample M1801751008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.16**	**U,Q**	**mg/Kg**	**5**	0.64	0.16	5/3/2018 23:57	M
Phenanthrene	**0.16**	**U,Q**	**mg/Kg**	**5**	0.64	0.16	5/3/2018 23:57	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/3/2018 23:57	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/3/2018 23:57	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/3/2018 23:57	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**46000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:17	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**46000**		**mg/Kg**	**10**	5200	4100	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1200**	**U**	**mg/Kg**	**10**	1300	1200	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**40**	**U**	**mg/Kg**	**5**	400	40	5/3/2018 00:41	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**61000**		**mg/Kg**	**1**			5/11/2018 09:32	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**94**		**%**	**1**			5/8/2018 12:07	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751009** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **568 Nym/Pads Loose Muck W/Fibe** Date Collected: 04/16/18 00:00

Results for sample M1801751009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.2**	**U**	**mg/Kg**	**1**	12	2.2	5/7/2018 17:42	M
Arsenic	**6.3**	**I**	**mg/Kg**	**1**	36	2.5	5/7/2018 17:42	M
Beryllium	**0.24**	**I**	**mg/Kg**	**1**	1.2	0.14	5/7/2018 17:42	M
Cadmium	**0.48**	**I**	**mg/Kg**	**1**	6.0	0.20	5/7/2018 17:42	M
Chromium	**12**		**mg/Kg**	**1**	6.0	4.3	5/7/2018 17:42	M
Copper	**21**	**I**	**mg/Kg**	**1**	120	3.6	5/7/2018 17:42	M
Lead	**20**		**mg/Kg**	**1**	12	1.3	5/7/2018 17:42	M
Nickel	**7.9**	**I**	**mg/Kg**	**1**	60	2.8	5/7/2018 17:42	M
Zinc	**30**	**I**	**mg/Kg**	**1**	60	9.4	5/7/2018 17:42	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.098**	**I**	**mg/Kg**	**1**	0.11	0.016	5/10/2018 13:11	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.047**	**U,Q**	**mg/Kg**	**1**	0.19	0.047	5/4/2018 00:24	M
Phenanthrene	**0.048**	**U,Q**	**mg/Kg**	**1**	0.19	0.048	5/4/2018 00:24	M
Nitrobenzene-d5 (S)	**91**		**%**	**1**	33-134		5/4/2018 00:24	
2-Fluorobiphenyl (S)	**72**		**%**	**1**	37-127		5/4/2018 00:24	
p-Terphenyl-d14 (S)	**102**		**%**	**1**	42-141		5/4/2018 00:24	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**25000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:17	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**25000**		**mg/Kg**	**10**	9800	7800	5/10/2018 18:05	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**2300**	**U**	**mg/Kg**	**10**	2400	2300	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751009** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **568 Nym/Pads Loose Muck W/Fibe** Date Collected: 04/16/18 00:00

Results for sample M1801751009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**52**	**U**	**mg/Kg**	**5**	520	52	5/3/2018 03:21	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**42000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**96**		**%**	**1**			5/2/2018 12:02	M

Lab ID: **M1801751010** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **602 NymCat Brown H2O With Root** Date Collected: 04/17/18 00:00

Results for sample M1801751010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**14**	**U**	**mg/Kg**	**1**	76	14	5/7/2018 17:45	M
Arsenic	**16**	**U**	**mg/Kg**	**1**	230	16	5/7/2018 17:45	M
Beryllium	**0.90**	**U**	**mg/Kg**	**1**	7.6	0.90	5/7/2018 17:45	M
Cadmium	**1.3**	**U**	**mg/Kg**	**1**	38	1.3	5/7/2018 17:45	M
Chromium	**47**		**mg/Kg**	**1**	38	27	5/7/2018 17:45	M
Copper	**120**	**I**	**mg/Kg**	**1**	760	23	5/7/2018 17:45	M
Lead	**52**	**I**	**mg/Kg**	**1**	76	7.9	5/7/2018 17:45	M
Nickel	**27**	**I**	**mg/Kg**	**1**	380	18	5/7/2018 17:45	M
Zinc	**180**	**I**	**mg/Kg**	**1**	380	60	5/7/2018 17:45	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.41**	**I**	**mg/Kg**	**1**	0.72	0.10	5/10/2018 13:14	J
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751010** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **602 NymCat Brown H2O With Root** Date Collected: 04/17/18 00:00

Results for sample M1801751010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.31**	**U,Q**	**mg/Kg**	**1**	1.3	0.31	5/4/2018 00:50	M
Phenanthrene	**0.32**	**U,Q**	**mg/Kg**	**1**	1.3	0.32	5/4/2018 00:50	M
Nitrobenzene-d5 (S)	**93**		**%**	**1**	33-134		5/4/2018 00:50	
2-Fluorobiphenyl (S)	**75**		**%**	**1**	37-127		5/4/2018 00:50	
p-Terphenyl-d14 (S)	**100**		**%**	**1**	42-141		5/4/2018 00:50	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**83000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:17	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**83000**	**J4**	**mg/Kg**	**10**	29000	23000	5/10/2018 16:01	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**6800**	**U**	**mg/Kg**	**10**	7100	6800	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**350**	**U**	**mg/Kg**	**5**	3500	350	5/3/2018 01:01	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**6500**		**mg/Kg**	**1**			5/11/2018 09:32	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**99**		**%**	**1**			5/8/2018 12:07	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751011** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **606 Pontus Brown H2O & Roots** Date Collected: 04/17/18 00:00

Results for sample M1801751011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.6**	**U**	**mg/Kg**	**1**	15	2.6	5/7/2018 17:49	M
Arsenic	**3.1**	**U**	**mg/Kg**	**1**	44	3.1	5/7/2018 17:49	M
Beryllium	**0.17**	**U**	**mg/Kg**	**1**	1.5	0.17	5/7/2018 17:49	M
Cadmium	**0.25**	**U**	**mg/Kg**	**1**	7.3	0.25	5/7/2018 17:49	M
Chromium	**5.3**	**U**	**mg/Kg**	**1**	7.3	5.3	5/7/2018 17:49	M
Copper	**8.5**	**I**	**mg/Kg**	**1**	150	4.4	5/7/2018 17:49	M
Lead	**6.9**	**I**	**mg/Kg**	**1**	15	1.5	5/7/2018 17:49	M
Nickel	**3.5**	**U**	**mg/Kg**	**1**	73	3.5	5/7/2018 17:49	M
Zinc	**22**	**I**	**mg/Kg**	**1**	73	12	5/7/2018 17:49	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.021**	**U**	**mg/Kg**	**1**	0.15	0.021	5/10/2018 13:18	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.33**	**U,Q**	**mg/Kg**	**5**	1.3	0.33	5/4/2018 01:17	M
Phenanthrene	**0.33**	**U,Q**	**mg/Kg**	**5**	1.3	0.33	5/4/2018 01:17	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/4/2018 01:17	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/4/2018 01:17	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/4/2018 01:17	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**19000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:18	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**19000**		**mg/Kg**	**10**	8200	6500	5/11/2018 13:20	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**2000**	**U**	**mg/Kg**	**10**	2000	2000	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751011** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **606 Pontus Brown H2O & Roots** Date Collected: 04/17/18 00:00

Results for sample M1801751011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**71**	**U**	**mg/Kg**	**5**	710	71	5/3/2018 03:41	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**32000**		**mg/Kg**	**1**			5/11/2018 09:32	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**97**		**%**	**1**			5/8/2018 12:07	M

Lab ID: **M1801751012** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **609/611 Island Thhick Muck,roo** Date Collected: 04/17/18 00:00

Results for sample M1801751012 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.60**	**U**	**mg/Kg**	**1**	3.4	0.60	5/8/2018 15:16	M
Arsenic	**1.3**	**I**	**mg/Kg**	**1**	10	0.70	5/8/2018 15:16	M
Beryllium	**0.040**	**U**	**mg/Kg**	**1**	0.34	0.040	5/8/2018 15:16	M
Cadmium	**0.10**	**I**	**mg/Kg**	**1**	1.7	0.056	5/8/2018 15:16	M
Chromium	**3.0**		**mg/Kg**	**1**	1.7	1.2	5/8/2018 15:16	M
Copper	**6.7**	**I**	**mg/Kg**	**1**	34	1.0	5/8/2018 15:16	M
Lead	**8.7**		**mg/Kg**	**1**	3.4	0.35	5/8/2018 15:16	M
Nickel	**1.9**	**I**	**mg/Kg**	**1**	17	0.79	5/8/2018 15:16	M
Zinc	**7.4**	**I**	**mg/Kg**	**1**	17	2.7	5/8/2018 15:16	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.030**	**I**	**mg/Kg**	**1**	0.035	0.0048	5/10/2018 13:21	J
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751012** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **609/611 Island Thhick Muck,roo** Date Collected: 04/17/18 00:00

Results for sample M1801751012 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.014**	**U,Q**	**mg/Kg**	**1**	0.055	0.014	5/4/2018 01:43	M
Phenanthrene	**0.014**	**U,Q**	**mg/Kg**	**1**	0.055	0.014	5/4/2018 01:43	M
Nitrobenzene-d5 (S)	**102**		**%**	**1**	33-134		5/4/2018 01:43	
2-Fluorobiphenyl (S)	**80**		**%**	**1**	37-127		5/4/2018 01:43	
p-Terphenyl-d14 (S)	**101**		**%**	**1**	42-141		5/4/2018 01:43	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**11000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:18	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**11000**		**mg/Kg**	**10**	2100	1700	5/11/2018 13:20	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**510**	**U**	**mg/Kg**	**10**	530	510	5/10/2018 18:05	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**17**	**U**	**mg/Kg**	**5**	170	17	5/3/2018 04:01	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**140000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**86**		**%**	**1**			5/2/2018 12:02	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751013** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **613 Typont Wet,mucky,fibrous** Date Collected: 04/17/18 00:00

Results for sample M1801751013 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.4**	**U**	**mg/Kg**	**1**	8.0	1.4	5/8/2018 15:20	M
Arsenic	**1.7**	**U**	**mg/Kg**	**1**	24	1.7	5/8/2018 15:20	M
Beryllium	**0.095**	**U**	**mg/Kg**	**1**	0.80	0.095	5/8/2018 15:20	M
Cadmium	**0.13**	**U**	**mg/Kg**	**1**	4.0	0.13	5/8/2018 15:20	M
Chromium	**3.4**	**I**	**mg/Kg**	**1**	4.0	2.9	5/8/2018 15:20	M
Copper	**5.9**	**I**	**mg/Kg**	**1**	80	2.4	5/8/2018 15:20	M
Lead	**8.6**		**mg/Kg**	**1**	8.0	0.84	5/8/2018 15:20	M
Nickel	**2.2**	**I**	**mg/Kg**	**1**	40	1.9	5/8/2018 15:20	M
Zinc	**6.3**	**U**	**mg/Kg**	**1**	40	6.3	5/8/2018 15:20	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.053**	**I**	**mg/Kg**	**1**	0.082	0.011	5/10/2018 13:24	J
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.032**	**U,Q**	**mg/Kg**	**1**	0.13	0.032	5/4/2018 02:10	M
Phenanthrene	**0.033**	**U,Q**	**mg/Kg**	**1**	0.13	0.033	5/4/2018 02:10	M
Nitrobenzene-d5 (S)	**102**		**%**	**1**	33-134		5/4/2018 02:10	
2-Fluorobiphenyl (S)	**79**		**%**	**1**	37-127		5/4/2018 02:10	
p-Terphenyl-d14 (S)	**110**		**%**	**1**	42-141		5/4/2018 02:10	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**12000**		**mg/Kg**	**1**	0.10	0.10	5/15/2018 08:18	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**12000**		**mg/Kg**	**10**	5600	4400	5/11/2018 13:20	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1300**	**U**	**mg/Kg**	**10**	1400	1300	5/10/2018 18:05	M

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ANALYTICAL RESULTS

Workorder: M1801751 Nutrient Contamniants

Lab ID: **M1801751013** Date Received: 04/27/18 12:16 Matrix: Soil

Sample ID: **613 Typont Wet,mucky,fibrous** Date Collected: 04/17/18 00:00

Results for sample M1801751013 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**39**	**U**	**mg/Kg**	**5**	390	39	5/3/2018 04:21	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**60000**		**mg/Kg**	**1**			5/4/2018 13:49	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**94**		**%**	**1**			5/2/2018 12:02	M

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ANALYTICAL RESULTS QUALIFIERS

Workorder: M1801751 Nutrient Contamniants

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.
[1]	Surrogate diluted out.
Q	Missed Hold Time
J4	Estimated Result

LAB QUALIFIERS

J	DOH Certification #E82574(AEL-JAX)(FL NELAC Certification)
M	DOH Certification #E82535(AEL-M)(FL NELAC Certification)
M^	Not Certified

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QUALITY CONTROL DATA

Workorder: M1801751 Nutrient Contamniants

QC Batch: EXTm/1405 Analysis Method: SW-846 8270C (SIM)
QC Batch Method: SW-846 3550B Prepared: 05/02/2018 09:00
Associated Lab Samples: M1801751001, M1801751002, M1801751003, M1801751004, M1801751005, M1801751006, M1801751007,

METHOD BLANK: 2698519

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
SEMIVOLATILES				
Phenanthrene	mg/Kg	0.0020	0.0020	U
Fluoranthene	mg/Kg	0.0020	0.0020	U
Nitrobenzene-d5 (S)	%	95	33-134	
2-Fluorobiphenyl (S)	%	77	37-127	
p-Terphenyl-d14 (S)	%	97	42-141	

QC Batch: WCAm/2244 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: M1801751001, M1801751002, M1801751003, M1801751004, M1801751005, M1801751006, M1801751007,

METHOD BLANK: 2700378

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Nitrate + Nitrite	mg/Kg	0.50	0.50	U

QC Batch: WCAm/2245 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: M1801751009, M1801751011, M1801751012, M1801751013

METHOD BLANK: 2700382

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Nitrate + Nitrite	mg/Kg	0.50	0.50	U

QC Batch: WCAm/2256 Analysis Method: EPA 351.2
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/09/2018 15:25
Associated Lab Samples: M1801751001, M1801751002, M1801751003, M1801751004, M1801751005, M1801751006, M1801751007,

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QUALITY CONTROL DATA

Workorder: M1801751 Nutrient Contamniants

METHOD BLANK: 2701173

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	33	33	U

METHOD BLANK: 2701174

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	9.9	9.9	U

QC Batch: WCAm/2256 Analysis Method: EPA 365.4
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/09/2018 15:25
Associated Lab Samples: M1801751001, M1801751002, M1801751003, M1801751004, M1801751005, M1801751006, M1801751007,

METHOD BLANK: 2701173

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	33	33	U

METHOD BLANK: 2701174

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	9.9	9.9	U

QC Batch: DGMm/1271 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3050B Prepared: 05/03/2018 10:50
Associated Lab Samples: M1801751004, M1801751006, M1801751007, M1801751008, M1801751009, M1801751010, M1801751011,

METHOD BLANK: 2702407

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Arsenic	mg/Kg	0.10	0.10	U

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QUALITY CONTROL DATA

Workorder: M1801751 Nutrient Contamniants

METHOD BLANK: 2702407

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Beryllium	mg/Kg	0.0058	0.0058	U
Cadmium	mg/Kg	0.0082	0.0082	U
Chromium	mg/Kg	0.18	0.18	U
Copper	mg/Kg	0.15	0.15	U
Nickel	mg/Kg	0.12	0.12	U
Lead	mg/Kg	0.051	0.051	U
Antimony	mg/Kg	0.088	0.088	U
Zinc	mg/Kg	0.39	0.39	U

QC Batch: WCAm/2276 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Prepared:
Associated Lab Samples: M1801751004, M1801751006, M1801751007, M1801751009, M1801751012, M1801751013

QC Batch: DGMj/1505 Analysis Method: SW-846 7471A
QC Batch Method: SW-846 7471A Prepared: 05/10/2018 11:10
Associated Lab Samples: M1801751004, M1801751006, M1801751007, M1801751008, M1801751009, M1801751010, M1801751011,

METHOD BLANK: 2708506

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Mercury	mg/Kg	0.00070	0.00070	U

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801751001	552 Cattail F brous Root	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751002	553 Pont Tussock	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751003	555 Myrian Root Fiber + Pont	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751004	558 Ponts Root Fiber/loose muc	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751005	560 BR Fibrous Root/Loose Muck	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751006	563 Tussock MWS Root Fiber/loo	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751007	564 Tussock root f ber/muck	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751008	566 Tussock Root Fiber/Muck	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751009	568 Nym/Pads Loose Muck W/Fibe	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751010	602 NymCat Brown H2O With Root	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751011	606 Pontus Brown H2O & Roots	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751012	609/611 Island Thhick Muck,roo	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751013	613 Typont Wet,mucky,fibrous	SW-846 3550B	EXTm/1405	SW-846 8270C (SIM)	MSSm/1170
M1801751004	558 Ponts Root Fiber/loose muc			SM 2540G	WCAm/2236
M1801751006	563 Tussock MWS Root Fiber/loo			SM 2540G	WCAm/2236
M1801751007	564 Tussock root f ber/muck			SM 2540G	WCAm/2236
M1801751009	568 Nym/Pads Loose Muck W/Fibe			SM 2540G	WCAm/2236
M1801751012	609/611 Island Thhick Muck,roo			SM 2540G	WCAm/2236
M1801751013	613 Typont Wet,mucky,fibrous			SM 2540G	WCAm/2236
M1801751001	552 Cattail F brous Root			EPA 9056	WCAm/2244
M1801751002	553 Pont Tussock			EPA 9056	WCAm/2244
M1801751003	555 Myrian Root Fiber + Pont			EPA 9056	WCAm/2244
M1801751004	558 Ponts Root Fiber/loose muc			EPA 9056	WCAm/2244
M1801751005	560 BR Fibrous Root/Loose Muck			EPA 9056	WCAm/2244
M1801751006	563 Tussock MWS Root Fiber/loo			EPA 9056	WCAm/2244
M1801751007	564 Tussock root f ber/muck			EPA 9056	WCAm/2244

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801751008	566 Tussock Root Fiber/Muck			EPA 9056	WCAm/2244
M1801751010	602 NymCat Brown H2O With Root			EPA 9056	WCAm/2244
M1801751009	568 Nym/Pads Loose Muck W/Fibe			EPA 9056	WCAm/2245
M1801751011	606 Pontus Brown H2O & Roots			EPA 9056	WCAm/2245
M1801751012	609/611 Island Thhick Muck,roo			EPA 9056	WCAm/2245
M1801751013	613 Typont Wet,mucky,fibrous			EPA 9056	WCAm/2245
M1801751001	552 Cattail F brous Root	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751002	553 Pont Tussock	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751003	555 Myrian Root Fiber + Pont	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751004	558 Ponts Root Fiber/loose muc	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751005	560 BR Fibrous Root/Loose Muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751006	563 Tussock MWS Root Fiber/loo	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751007	564 Tussock root f ber/muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751008	566 Tussock Root Fiber/Muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751009	568 Nym/Pads Loose Muck W/Fibe	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751010	602 NymCat Brown H2O With Root	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751011	606 Pontus Brown H2O & Roots	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751012	609/611 Island Thhick Muck,roo	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751013	613 Typont Wet,mucky,fibrous	Copper Sulfate Digestion Solid	WCAm/2256	EPA 365.4	WCAm/2357
M1801751001	552 Cattail F brous Root	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751002	553 Pont Tussock	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751003	555 Myrian Root Fiber + Pont	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751004	558 Ponts Root Fiber/loose muc	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751005	560 BR Fibrous Root/Loose Muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751006	563 Tussock MWS Root Fiber/loo	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801751007	564 Tussock root f ber/muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751008	566 Tussock Root Fiber/Muck	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751009	568 Nym/Pads Loose Muck W/Fibe	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751010	602 NymCat Brown H2O With Root	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751011	606 Pontus Brown H2O & Roots	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751012	609/611 Island Thhick Muck,roo	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751013	613 Typont Wet,mucky,fibrous	Copper Sulfate Digestion Solid	WCAm/2256	EPA 351.2	WCAm/2358
M1801751004	558 Ponts Root Fiber/loose muc	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751006	563 Tussock MWS Root Fiber/loo	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751007	564 Tussock root f ber/muck	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751008	566 Tussock Root Fiber/Muck	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751009	568 Nym/Pads Loose Muck W/Fibe	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751010	602 NymCat Brown H2O With Root	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751011	606 Pontus Brown H2O & Roots	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751012	609/611 Island Thhick Muck,roo	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751013	613 Typont Wet,mucky,fibrous	SW-846 3050B	DGMm/1271	SW-846 6010	ICPm/1281
M1801751004	558 Ponts Root Fiber/loose muc			SM 2540G	WCAm/2276
M1801751006	563 Tussock MWS Root Fiber/loo			SM 2540G	WCAm/2276
M1801751007	564 Tussock root f ber/muck			SM 2540G	WCAm/2276
M1801751009	568 Nym/Pads Loose Muck W/Fibe			SM 2540G	WCAm/2276
M1801751012	609/611 Island Thhick Muck,roo			SM 2540G	WCAm/2276
M1801751013	613 Typont Wet,mucky,fibrous			SM 2540G	WCAm/2276
M1801751001	552 Cattail F brous Root			SM 2540G	WCAm/2292
M1801751002	553 Pont Tussock			SM 2540G	WCAm/2292
M1801751003	555 Myrian Root Fiber + Pont			SM 2540G	WCAm/2292

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801751005	560 BR Fibrous Root/Loose Muck			SM 2540G	WCAm/2292
M1801751001	552 Cattail F brous Root			SM 2540G	WCAm/2306
M1801751002	553 Pont Tussock			SM 2540G	WCAm/2306
M1801751003	555 Myrian Root Fiber + Pont			SM 2540G	WCAm/2306
M1801751005	560 BR Fibrous Root/Loose Muck			SM 2540G	WCAm/2306
M1801751008	566 Tussock Root Fiber/Muck			SM 2540G	WCAm/2308
M1801751010	602 NymCat Brown H2O With Root			SM 2540G	WCAm/2308
M1801751011	606 Pontus Brown H2O & Roots			SM 2540G	WCAm/2308
M1801751004	558 Ponts Root Fiber/loose muc	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751006	563 Tussock MWS Root Fiber/loo	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751007	564 Tussock root f ber/muck	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751008	566 Tussock Root Fiber/Muck	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751009	568 Nym/Pads Loose Muck W/Fibe	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751010	602 NymCat Brown H2O With Root	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751011	606 Pontus Brown H2O & Roots	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751012	609/611 Island Thhick Muck,roo	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751013	613 Typont Wet,mucky,fibrous	SW-846 7471A	DGMj/1505	SW-846 7471A	CVAj/1125
M1801751008	566 Tussock Root Fiber/Muck			SM 2540G	WCAm/2349
M1801751010	602 NymCat Brown H2O With Root			SM 2540G	WCAm/2349
M1801751011	606 Pontus Brown H2O & Roots			SM 2540G	WCAm/2349
M1801751001	552 Cattail F brous Root	Calculation	CLCm/	Calculation	CLCm/
M1801751002	553 Pont Tussock	Calculation	CLCm/	Calculation	CLCm/
M1801751003	555 Myrian Root Fiber + Pont	Calculation	CLCm/	Calculation	CLCm/

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801751 Nutrient Contamniants

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801751004	558 Ponts Root Fiber/loose muc	Calculation	CLCm/	Calculation	CLCm/
M1801751005	560 BR Fibrous Root/Loose Muck	Calculation	CLCm/	Calculation	CLCm/
M1801751006	563 Tussock MWS Root Fiber/loo	Calculation	CLCm/	Calculation	CLCm/
M1801751007	564 Tussock root f ber/muck	Calculation	CLCm/	Calculation	CLCm/
M1801751008	566 Tussock Root Fiber/Muck	Calculation	CLCm/	Calculation	CLCm/
M1801751009	568 Nym/Pads Loose Muck W/Fibe	Calculation	CLCm/	Calculation	CLCm/
M1801751010	602 NymCat Brown H2O With Root	Calculation	CLCm/	Calculation	CLCm/
M1801751011	606 Pontus Brown H2O & Roots	Calculation	CLCm/	Calculation	CLCm/
M1801751012	609/611 Island Thhick Muck,roo	Calculation	CLCm/	Calculation	CLCm/
M1801751013	613 Typont Wet,mucky,fibrous	Calculation	CLCm/	Calculation	CLCm/

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M1801751

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Palmer FL 33025 • 954.380.7998 • Fax 954.889.7931
Tampa FL 33619 • 813.630.0948 • Fax 813.630.4327

Client Name: Andrew Grattlich	Project Name: SFEC Nutrient Centers
Address: 30 S M Street	Project Number:
Lake Worth, FL 33460	PO Number:
Phone: 561-635-4374	FDEP Facility No.:
FAX:	FDEP Facility Address:
Contact:	
Sampled By: Grattlich, M Atlas	Special Instructions:
Turn Around Time: ☑ STANDARD ☐ RUSH	
AEL Profile #:	☐ ADaPT ☐ EQuIS ☐ Other

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	LABORATORY I.D. NUMBER
~~[illegible]~~							
552 Grattlich	Fibrous root	Grab	4/11/16		sed/plant		01
553 Root Tussock		Grab	4/11/16		sed/plant		02
555 Mixed	Root fiber + Peat	Grab	4/11/16		sed/plant		03
558 Ponds	Root fiber w/ loose muck	Grab	4/11/16		sed/plant		04
560 BR	Fibrous root w/ loose muck	Grab	4/11/16		sed/plant		05
563 Tussock MWS	root fiber w/ muck	Grab	4/11/16		sed/plant		06
564 Tussock	Root fiber w/ muck	Grab	4/11/16		sed/plant		07
566 Tussock	Root fiber w/ muck	Grab	4/11/16		sed/plant		08
568 Nymphaeides	loose muck w/ fiber	Grab	4/11/16		sed/plant		09

ANALYSIS REQUIRED — BOTTLE SIZE & TYPE; Preservation; Flash Filtered?

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) 2.3 °C

UCN: AD-051 Form last revised 06/19/2017 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]	4/27/16	1216	[signature]	4/27/16	1216
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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☐ Jacksonville: 6561 Southpoint Pkwy. • Jacksonville, FL 32216 • 904.363.9350 • Fax 904.363.9354
☐ Tallahassee: 2839 North Monroe St., Suite D, Tallahassee, FL 32303 • 850.219.6275 • Fax 850.219.6275

M1801751

2 of 2

352.377.2349 • Fax 352.395.6839
883.2885 • Fax 904.880.2791
30.9316 • Fax 813.630.4327

Client Name: Andrew Gottlieb	Project Name: SFEC Vacant Lands
Address: 30 S. M St	Project Number:
Lake Worth, FL 33460	PO Number:
Phone: 561-635-4374	FDEP Facility No:
FAX:	FDEP Facility Address:
Contact:	
Sampled By: A. Gottlieb, M. Adler	Special Instructions:
Turn Around Time: ☐ STANDARD ☐ RUSH	
AEL Profile #	☐ ADaPT ☐ EQuIS ☐ Other

ANALYSIS REQUIRED

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	LABORATORY I.D. NUMBER
602 Nwm	Gel brown H2O with root fibers	grab	4/17		Soil/Plant		010
606 Pontiteg	brown H2O & roots	grab	4/17		Soil/Plant		011
609/611 Island	thick muck, roots, leaves, sand	grab	4/17		Soil/Plant		012
613 Typhalt	wet, mucky, fibrous	grab	4/17		Soil/Plant		013
618 Qud mash	mostly solid pieces roots	grab	4/17		Soil/Plant		014

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) 2.8 °C

DCN: AD-051 Form last revised 08/19/2017

Device used for measuring Temp by unique identifier (circle IR temp gun used): J: 9A G: LT-1 LT-2 I: 10A A: 3A M: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	4-27-18	1216	[signature]	4-27-18	1216
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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May 24, 2018

Andrew Gottlieb
South Florida Engineering & Consultants
30 South M Street
Lake Worth, FL 33460

RE: Workorder: M1801856 SFEC Nutrient Count

Dear Andrew Gottlieb:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, May 04, 2018. 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,

Tiffany Mackie

Tiffany Mackie - Client Services Manager
TMackie@AELLab.com

Enclosures

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SAMPLE SUMMARY

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Matrix	Date Collected	Date Received
M1801856001	626-627 Root Fiber W/Mulch	Soil	4/30/2018 00:00	5/4/2018 11:05
M1801856002	629 Myrium	Soil	4/30/2018 00:00	5/4/2018 11:05
M1801856003	630 Myrian Island Fine Root +	Soil	4/30/2018 00:00	5/4/2018 11:05
M1801856004	633 Cattail-Fine Roots W/Muck	Soil	4/30/2018 00:00	5/4/2018 11:05
M1801856005	678 Pads vg W/Loose Muck	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856006	684 Cattail Fine Roots W/Loose	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856007	691 Willows Point	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856008	718 N Fine Roots W/Muck	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856009	723-724 Cat Fine Roots Loose k	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856010	738-739 Cat-Pont Fine roots w/	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856011	746 Pont Elm Fine Root W/ Loos	Soil	5/1/2018 00:00	5/4/2018 11:05
M1801856012	661 Ponds Runny Muck	Soil	4/30/2018 00:00	5/4/2018 11:05

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856001** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **626-627 Root Fiber W/Mulch** Date Collected: 04/30/18 00:00

Results for sample M1801856001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.7**	**U**	**mg/Kg**	**1**	9.2	1.7	5/16/2018 15:58	M
Arsenic	**3.2**	**I**	**mg/Kg**	**1**	28	1.9	5/16/2018 15:58	M
Beryllium	**0.11**	**U**	**mg/Kg**	**1**	0.92	0.11	5/16/2018 15:58	M
Cadmium	**0.18**	**I**	**mg/Kg**	**1**	4.6	0.16	5/16/2018 15:58	M
Chromium	**8.0**		**mg/Kg**	**1**	4.6	3.3	5/16/2018 15:58	M
Copper	**19**	**I**	**mg/Kg**	**1**	92	2.8	5/16/2018 15:58	M
Lead	**11**		**mg/Kg**	**1**	9.2	0.97	5/16/2018 15:58	M
Nickel	**4.6**	**I**	**mg/Kg**	**1**	46	2.2	5/16/2018 15:58	M
Zinc	**22**	**I**	**mg/Kg**	**1**	46	7.3	5/16/2018 15:58	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.10**		**mg/Kg**	**1**	0.096	0.013	5/7/2018 14:40	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.19**	**I**	**mg/L**	**1**	0.20	0.080	5/16/2018 17:32	M
Copper	**0.0031**	**I**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 17:32	M
Lead	**0.0021**	**I**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 17:32	M
Zinc	**0.0078**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 17:32	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.039**	**U**	**mg/Kg**	**1**	0.16	0.039	5/8/2018 18:05	M
Phenanthrene	**0.040**	**U**	**mg/Kg**	**1**	0.16	0.040	5/8/2018 18:05	M
Nitrobenzene-d5 (S)	**100**		**%**	**1**	33-134		5/8/2018 18:05	
2-Fluorobiphenyl (S)	**76**		**%**	**1**	37-127		5/8/2018 18:05	
p-Terphenyl-d14 (S)	**102**		**%**	**1**	42-141		5/8/2018 18:05	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**21000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:35	M^

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856001** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **626-627 Root Fiber W/Mulch** Date Collected: 04/30/18 00:00

Results for sample M1801856001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**21000**		**mg/Kg**	**10**	6300	5000	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1500**	**U**	**mg/Kg**	**10**	1600	1500	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**41**	**I**	**mg/Kg**	**1**	99	9.9	5/14/2018 13:55	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**51000**		**mg/Kg**	**1**			5/8/2018 11:59	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**95**		**%**	**1**			5/4/2018 20:37	M

Lab ID: **M1801856002** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **629 Myrium** Date Collected: 04/30/18 00:00

Results for sample M1801856002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.82**	**U**	**mg/Kg**	**1**	4.6	0.82	5/16/2018 16:05	M
Arsenic	**2.0**	**I**	**mg/Kg**	**1**	14	0.95	5/16/2018 16:05	M
Beryllium	**0.054**	**U**	**mg/Kg**	**1**	0.46	0.054	5/16/2018 16:05	M
Cadmium	**0.091**	**I**	**mg/Kg**	**1**	2.3	0.077	5/16/2018 16:05	M
Chromium	**4.4**		**mg/Kg**	**1**	2.3	1.6	5/16/2018 16:05	M
Copper	**8.9**	**I**	**mg/Kg**	**1**	46	1.4	5/16/2018 16:05	M
Lead	**7.7**		**mg/Kg**	**1**	4.6	0.48	5/16/2018 16:05	M

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856002** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **629 Myrium** Date Collected: 04/30/18 00:00

Results for sample M1801856002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nickel	**2.8**	**I**	**mg/Kg**	**1**	23	1.1	5/16/2018 16:05	M
Zinc	**8.4**	**I**	**mg/Kg**	**1**	23	3.6	5/16/2018 16:05	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.058**		**mg/Kg**	**1**	0.050	0.0070	5/7/2018 14:55	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.19**	**I**	**mg/L**	**1**	0.20	0.080	5/16/2018 17:36	M
Copper	**0.0049**	**I**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 17:36	M
Lead	**0.0051**	**I**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 17:36	M
Zinc	**0.0097**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 17:36	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.020**	**U**	**mg/Kg**	**1**	0.078	0.020	5/8/2018 18:31	M
Phenanthrene	**0.020**	**U**	**mg/Kg**	**1**	0.078	0.020	5/8/2018 18:31	M
Nitrobenzene-d5 (S)	**125**		**%**	**1**	33-134		5/8/2018 18:31	
2-Fluorobiphenyl (S)	**93**		**%**	**1**	37-127		5/8/2018 18:31	
p-Terphenyl-d14 (S)	**124**		**%**	**1**	42-141		5/8/2018 18:31	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**12000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:35	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**12000**		**mg/Kg**	**10**	4000	3200	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**950**	**U**	**mg/Kg**	**10**	990	950	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856002** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **629 Myrium** Date Collected: 04/30/18 00:00

Results for sample M1801856002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate + Nitrite	**4.6**	**U**	**mg/Kg**	**1**	46	4.6	5/14/2018 14:15	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**99000**		**mg/Kg**	**1**			5/8/2018 11:59	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**90**		**%**	**1**			5/4/2018 20:37	M

Lab ID: **M1801856003** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **630 Myrian Island Fine Root +** Date Collected: 04/30/18 00:00

Results for sample M1801856003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.75**	**U**	**mg/Kg**	**1**	4.1	0.75	5/16/2018 16:09	M
Arsenic	**3.9**	**I**	**mg/Kg**	**1**	12	0.87	5/16/2018 16:09	M
Beryllium	**0.17**	**I**	**mg/Kg**	**1**	0.41	0.049	5/16/2018 16:09	M
Cadmium	**0.17**	**I**	**mg/Kg**	**1**	2.1	0.070	5/16/2018 16:09	M
Chromium	**6.5**		**mg/Kg**	**1**	2.1	1.5	5/16/2018 16:09	M
Copper	**15**	**I**	**mg/Kg**	**1**	41	1.2	5/16/2018 16:09	M
Lead	**14**		**mg/Kg**	**1**	4.1	0.43	5/16/2018 16:09	M
Nickel	**5.3**	**I**	**mg/Kg**	**1**	21	0.98	5/16/2018 16:09	M
Zinc	**15**	**I**	**mg/Kg**	**1**	21	3.3	5/16/2018 16:09	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.11**		**mg/Kg**	**1**	0.042	0.0058	5/7/2018 14:58	J
METALS, SPLP								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856003** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **630 Myrian Island Fine Root +** Date Collected: 04/30/18 00:00

Results for sample M1801856003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.17**	I	**mg/L**	**1**	0.20	0.080	5/16/2018 17:40	M
Copper	**0.0040**	I	**mg/L**	**1**	0.0080	0.0025	5/16/2018 17:40	M
Lead	**0.0072**		**mg/L**	**1**	0.0070	0.0011	5/16/2018 17:40	M
Zinc	**0.013**		**mg/L**	**1**	0.010	0.0050	5/16/2018 17:40	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.018**	U	**mg/Kg**	**1**	0.073	0.018	5/9/2018 07:20	M
Phenanthrene	**0.019**	U	**mg/Kg**	**1**	0.073	0.019	5/9/2018 07:20	M
Nitrobenzene-d5 (S)	**98**		**%**	**1**	33-134		5/9/2018 07:20	
2-Fluorobiphenyl (S)	**78**		**%**	**1**	37-127		5/9/2018 07:20	
p-Terphenyl-d14 (S)	**103**		**%**	**1**	42-141		5/9/2018 07:20	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**22000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:35	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**22000**		**mg/Kg**	**10**	3000	2400	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**730**	U	**mg/Kg**	**10**	760	730	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**4.2**	U	**mg/Kg**	**1**	42	4.2	5/14/2018 14:35	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**110000**		**mg/Kg**	**1**			5/8/2018 11:59	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856003** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **630 Myrian Island Fine Root +** Date Collected: 04/30/18 00:00
Results for sample M1801856003 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Percent Moisture	**89**		**%**	**1**			5/4/2018 20:37	M

Lab ID: **M1801856004** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **633 Cattail-Fine Roots W/Muck** Date Collected: 04/30/18 00:00
Results for sample M1801856004 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.0**	**U**	**mg/Kg**	**1**	11	2.0	5/16/2018 16:13	M
Arsenic	**2.3**	**U**	**mg/Kg**	**1**	33	2.3	5/16/2018 16:13	M
Beryllium	**0.13**	**U**	**mg/Kg**	**1**	1.1	0.13	5/16/2018 16:13	M
Cadmium	**0.18**	**U**	**mg/Kg**	**1**	5.4	0.18	5/16/2018 16:13	M
Chromium	**3.9**	**U**	**mg/Kg**	**1**	5.4	3.9	5/16/2018 16:13	M
Copper	**11**	**I**	**mg/Kg**	**1**	110	3.2	5/16/2018 16:13	M
Lead	**5.6**	**I**	**mg/Kg**	**1**	11	1.1	5/16/2018 16:13	M
Nickel	**4.5**	**I**	**mg/Kg**	**1**	54	2.6	5/16/2018 16:13	M
Zinc	**23**	**I**	**mg/Kg**	**1**	54	8.6	5/16/2018 16:13	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.094**	**I**	**mg/Kg**	**1**	0.11	0.015	5/7/2018 15:01	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/16/2018 17:43	M
Copper	**0.0025**	**U**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 17:43	M
Lead	**0.0011**	**I**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 17:43	M
Zinc	**0.0091**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 17:43	M
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856004** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **633 Cattail-Fine Roots W/Muck** Date Collected: 04/30/18 00:00

Results for sample M1801856004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.045**	**U**	**mg/Kg**	**1**	0.18	0.045	5/9/2018 07:46	M
Phenanthrene	**0.045**	**U**	**mg/Kg**	**1**	0.18	0.045	5/9/2018 07:46	M
Nitrobenzene-d5 (S)	**100**		**%**	**1**	33-134		5/9/2018 07:46	
2-Fluorobiphenyl (S)	**77**		**%**	**1**	37-127		5/9/2018 07:46	
p-Terphenyl-d14 (S)	**99**		**%**	**1**	42-141		5/9/2018 07:46	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**18000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:35	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**18000**		**mg/Kg**	**10**	7100	5700	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1700**	**U**	**mg/Kg**	**10**	1800	1700	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**70**	**I**	**mg/Kg**	**1**	97	9.7	5/14/2018 15:47	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**46000**		**mg/Kg**	**1**			5/8/2018 11:59	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**95**		**%**	**1**			5/4/2018 20:37	M

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856005** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **678 Pads vg W/Loose Muck** Date Collected: 05/01/18 00:00

Results for sample M1801856005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.7**	**U**	**mg/Kg**	**1**	15	2.7	5/16/2018 16:56	M
Arsenic	**4.4**	**I**	**mg/Kg**	**1**	46	3.2	5/16/2018 16:56	M
Beryllium	**0.18**	**U**	**mg/Kg**	**1**	1.5	0.18	5/16/2018 16:56	M
Cadmium	**0.26**	**U**	**mg/Kg**	**1**	7.6	0.26	5/16/2018 16:56	M
Chromium	**6.2**	**I**	**mg/Kg**	**1**	7.6	5.5	5/16/2018 16:56	M
Copper	**22**	**I**	**mg/Kg**	**1**	150	4.5	5/16/2018 16:56	M
Lead	**9.9**	**I**	**mg/Kg**	**1**	15	1.6	5/16/2018 16:56	M
Nickel	**8.8**	**I**	**mg/Kg**	**1**	76	3.6	5/16/2018 16:56	M
Zinc	**44**	**I**	**mg/Kg**	**1**	76	12	5/16/2018 16:56	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.047**	**I**	**mg/Kg**	**1**	0.15	0.021	5/7/2018 15:05	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/16/2018 18:37	M
Copper	**0.0025**	**U**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 18:37	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 18:37	M
Zinc	**0.0052**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 18:37	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.067**	**U**	**mg/Kg**	**1**	0.27	0.067	5/9/2018 08:13	M
Phenanthrene	**0.069**	**U**	**mg/Kg**	**1**	0.27	0.069	5/9/2018 08:13	M
Nitrobenzene-d5 (S)	**103**		**%**	**1**	33-134		5/9/2018 08:13	
2-Fluorobiphenyl (S)	**77**		**%**	**1**	37-127		5/9/2018 08:13	
p-Terphenyl-d14 (S)	**99**		**%**	**1**	42-141		5/9/2018 08:13	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**22000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856005** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **678 Pads vg W/Loose Muck** Date Collected: 05/01/18 00:00

Results for sample M1801856005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**22000**		**mg/Kg**	**10**	7700	6100	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1800**	**U**	**mg/Kg**	**10**	1900	1800	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**16**	**U**	**mg/Kg**	**1**	160	16	5/14/2018 16:08	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**30000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**97**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856006** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **684 Cattail Fine Roots W/Loose** Date Collected: 05/01/18 00:00

Results for sample M1801856006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.1**	**U**	**mg/Kg**	**1**	6.3	1.1	5/16/2018 16:34	M
Arsenic	**1.3**	**U**	**mg/Kg**	**1**	19	1.3	5/16/2018 16:34	M
Beryllium	**0.075**	**U**	**mg/Kg**	**1**	0.63	0.075	5/16/2018 16:34	M
Cadmium	**0.11**	**U**	**mg/Kg**	**1**	3.2	0.11	5/16/2018 16:34	M
Chromium	**2.3**	**U**	**mg/Kg**	**1**	3.2	2.3	5/16/2018 16:34	M
Copper	**5.0**	**I**	**mg/Kg**	**1**	63	1.9	5/16/2018 16:34	M
Lead	**0.66**	**U**	**mg/Kg**	**1**	6.3	0.66	5/16/2018 16:34	M

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856006** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **684 Cattail Fine Roots W/Loose** Date Collected: 05/01/18 00:00

Results for sample M1801856006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nickel	**1.8**	**I**	**mg/Kg**	**1**	32	1.5	5/16/2018 16:34	M
Zinc	**6.4**	**I**	**mg/Kg**	**1**	32	5.0	5/16/2018 16:34	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.035**	**I**	**mg/Kg**	**1**	0.062	0.0087	5/7/2018 15:08	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.090**	**I**	**mg/L**	**1**	0.20	0.080	5/16/2018 18:41	M
Copper	**0.0031**	**I**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 18:41	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 18:41	M
Zinc	**0.0064**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 18:41	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.026**	**U**	**mg/Kg**	**1**	0.10	0.026	5/9/2018 08:39	M
Phenanthrene	**0.026**	**U**	**mg/Kg**	**1**	0.10	0.026	5/9/2018 08:39	M
Nitrobenzene-d5 (S)	**82**		**%**	**1**	33-134		5/9/2018 08:39	
2-Fluorobiphenyl (S)	**62**		**%**	**1**	37-127		5/9/2018 08:39	
p-Terphenyl-d14 (S)	**77**		**%**	**1**	42-141		5/9/2018 08:39	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**9100**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**9100**		**mg/Kg**	**10**	1900	1500	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**460**	**U**	**mg/Kg**	**10**	480	460	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856006** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **684 Cattail Fine Roots W/Loose** Date Collected: 05/01/18 00:00

Results for sample M1801856006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate + Nitrite	**6.7**	**U**	**mg/Kg**	**1**	67	6.7	5/14/2018 16:28	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**73000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**93**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856007** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **691 Willows Point** Date Collected: 05/01/18 00:00

Results for sample M1801856007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.25**	**U**	**mg/Kg**	**1**	1.4	0.25	5/16/2018 16:38	M
Arsenic	**8.1**		**mg/Kg**	**1**	4.2	0.29	5/16/2018 16:38	M
Beryllium	**0.62**		**mg/Kg**	**1**	0.14	0.016	5/16/2018 16:38	M
Cadmium	**0.24**	**I**	**mg/Kg**	**1**	0.69	0.023	5/16/2018 16:38	M
Chromium	**5.9**		**mg/Kg**	**1**	0.69	0.50	5/16/2018 16:38	M
Copper	**17**		**mg/Kg**	**1**	14	0.41	5/16/2018 16:38	M
Lead	**24**		**mg/Kg**	**1**	1.4	0.15	5/16/2018 16:38	M
Nickel	**5.7**	**I**	**mg/Kg**	**1**	6.9	0.33	5/16/2018 16:38	M
Zinc	**49**		**mg/Kg**	**1**	6.9	1.1	5/16/2018 16:38	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.098**		**mg/Kg**	**1**	0.013	0.0019	5/7/2018 15:17	J
METALS, SPLP								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856007** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **691 Willows Point** Date Collected: 05/01/18 00:00

Results for sample M1801856007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.27**		**mg/L**	**1**	0.20	0.080	5/16/2018 18:45	M
Copper	**0.0049**	I	**mg/L**	**1**	0.0080	0.0025	5/16/2018 18:45	M
Lead	**0.0011**	U	**mg/L**	**1**	0.0070	0.0011	5/16/2018 18:45	M
Zinc	**0.0050**	I	**mg/L**	**1**	0.010	0.0050	5/16/2018 18:45	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.027**	U	**mg/Kg**	**5**	0.11	0.027	5/9/2018 09:06	M
Phenanthrene	**0.028**	U	**mg/Kg**	**5**	0.11	0.028	5/9/2018 09:06	M
Nitrobenzene-d5 (S)	**99**		**%**	**5**	33-134		5/9/2018 09:06	
2-Fluorobiphenyl (S)	**78**		**%**	**5**	37-127		5/9/2018 09:06	
p-Terphenyl-d14 (S)	**101**		**%**	**5**	42-141		5/9/2018 09:06	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**17000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**17000**		**mg/Kg**	**10**	1000	810	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**760**		**mg/Kg**	**10**	250	240	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**6.8**	I	**mg/Kg**	**1**	13	1.3	5/14/2018 16:48	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**360000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856007** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **691 Willows Point** Date Collected: 05/01/18 00:00
Results for sample M1801856007 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Percent Moisture	**64**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856008** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **718 N Fine Roots W/Muck** Date Collected: 05/01/18 00:00
Results for sample M1801856008 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.1**	**U**	**mg/Kg**	**1**	12	2.1	5/16/2018 16:42	M
Arsenic	**3.0**	**I**	**mg/Kg**	**1**	35	2.5	5/16/2018 16:42	M
Beryllium	**0.14**	**U**	**mg/Kg**	**1**	1.2	0.14	5/16/2018 16:42	M
Cadmium	**0.20**	**U**	**mg/Kg**	**1**	5.9	0.20	5/16/2018 16:42	M
Chromium	**4.2**	**U**	**mg/Kg**	**1**	5.9	4.2	5/16/2018 16:42	M
Copper	**12**	**I**	**mg/Kg**	**1**	120	3.5	5/16/2018 16:42	M
Lead	**1.2**	**U**	**mg/Kg**	**1**	12	1.2	5/16/2018 16:42	M
Nickel	**2.8**	**U**	**mg/Kg**	**1**	59	2.8	5/16/2018 16:42	M
Zinc	**11**	**I**	**mg/Kg**	**1**	59	9.3	5/16/2018 16:42	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.038**	**I**	**mg/Kg**	**1**	0.12	0.016	5/7/2018 15:20	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/16/2018 19:07	M
Copper	**0.0036**	**I**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 19:07	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 19:07	M
Zinc	**0.0089**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 19:07	M
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856008** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **718 N Fine Roots W/Muck** Date Collected: 05/01/18 00:00

Results for sample M1801856008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.045**	**U**	**mg/Kg**	**1**	0.18	0.045	5/9/2018 09:32	M
Phenanthrene	**0.046**	**U**	**mg/Kg**	**1**	0.18	0.046	5/9/2018 09:32	M
Nitrobenzene-d5 (S)	**111**		**%**	**1**	33-134		5/9/2018 09:32	
2-Fluorobiphenyl (S)	**83**		**%**	**1**	37-127		5/9/2018 09:32	
p-Terphenyl-d14 (S)	**105**		**%**	**1**	42-141		5/9/2018 09:32	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**0.10**	**U**	**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**24000**		**mg/Kg**	**10**	3900	3100	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**490**		**mg/Kg**	**1**	97	93	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**11**	**U**	**mg/Kg**	**1**	110	11	5/18/2018 01:47	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**42000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**96**		**%**	**1**			5/4/2018 21:19	M

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856009** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **723-724 Cat Fine Roots Loose k** Date Collected: 05/01/18 00:00

Results for sample M1801856009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.2**	**U**	**mg/Kg**	**1**	6.6	1.2	5/16/2018 16:45	M
Arsenic	**9.9**	**I**	**mg/Kg**	**1**	20	1.4	5/16/2018 16:45	M
Beryllium	**0.078**	**U**	**mg/Kg**	**1**	0.66	0.078	5/16/2018 16:45	M
Cadmium	**0.11**	**U**	**mg/Kg**	**1**	3.3	0.11	5/16/2018 16:45	M
Chromium	**2.4**	**U**	**mg/Kg**	**1**	3.3	2.4	5/16/2018 16:45	M
Copper	**26**	**I**	**mg/Kg**	**1**	66	2.0	5/16/2018 16:45	M
Lead	**2.1**	**I**	**mg/Kg**	**1**	6.6	0.69	5/16/2018 16:45	M
Nickel	**3.0**	**I**	**mg/Kg**	**1**	33	1.6	5/16/2018 16:45	M
Zinc	**45**		**mg/Kg**	**1**	33	5.2	5/16/2018 16:45	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.055**	**I**	**mg/Kg**	**1**	0.066	0.0092	5/7/2018 15:28	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/16/2018 19:10	M
Copper	**0.0032**	**I**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 19:10	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 19:10	M
Zinc	**0.016**		**mg/L**	**1**	0.010	0.0050	5/16/2018 19:10	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.027**	**U**	**mg/Kg**	**1**	0.11	0.027	5/9/2018 17:57	M
Phenanthrene	**0.028**	**U**	**mg/Kg**	**1**	0.11	0.028	5/9/2018 17:57	M
Nitrobenzene-d5 (S)	**111**		**%**	**1**	33-134		5/9/2018 17:57	
2-Fluorobiphenyl (S)	**89**		**%**	**1**	37-127		5/9/2018 17:57	
p-Terphenyl-d14 (S)	**110**		**%**	**1**	42-141		5/9/2018 17:57	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**17000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856009** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **723-724 Cat Fine Roots Loose k** Date Collected: 05/01/18 00:00

Results for sample M1801856009 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**17000**		**mg/Kg**	**10**	4100	3300	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**99**	**U**	**mg/Kg**	**1**	100	99	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**49**	**I**	**mg/Kg**	**1**	67	6.7	5/18/2018 01:27	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**72000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**93**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856010** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **738-739 Cat-Pont Fine roots w/** Date Collected: 05/01/18 00:00

Results for sample M1801856010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.1**	**U**	**mg/Kg**	**1**	6.3	1.1	5/16/2018 16:49	M
Arsenic	**3.7**	**I**	**mg/Kg**	**1**	19	1.3	5/16/2018 16:49	M
Beryllium	**0.075**	**U**	**mg/Kg**	**1**	0.63	0.075	5/16/2018 16:49	M
Cadmium	**0.11**	**U**	**mg/Kg**	**1**	3.2	0.11	5/16/2018 16:49	M
Chromium	**4.3**		**mg/Kg**	**1**	3.2	2.3	5/16/2018 16:49	M
Copper	**13**	**I**	**mg/Kg**	**1**	63	1.9	5/16/2018 16:49	M
Lead	**5.3**	**I**	**mg/Kg**	**1**	6.3	0.66	5/16/2018 16:49	M

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856010** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **738-739 Cat-Pont Fine roots w/** Date Collected: 05/01/18 00:00

Results for sample M1801856010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nickel	**3.9**	**I**	**mg/Kg**	**1**	32	1.5	5/16/2018 16:49	M
Zinc	**37**		**mg/Kg**	**1**	32	5.0	5/16/2018 16:49	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.050**	**I**	**mg/Kg**	**1**	0.064	0.0090	5/7/2018 15:32	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/16/2018 19:14	M
Copper	**0.0025**	**U**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 19:14	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 19:14	M
Zinc	**0.0075**	**I**	**mg/L**	**1**	0.010	0.0050	5/16/2018 19:14	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.030**	**U**	**mg/Kg**	**1**	0.12	0.030	5/9/2018 18:23	M
Phenanthrene	**0.030**	**U**	**mg/Kg**	**1**	0.12	0.030	5/9/2018 18:23	M
Nitrobenzene-d5 (S)	**116**		**%**	**1**	33-134		5/9/2018 18:23	
2-Fluorobiphenyl (S)	**89**		**%**	**1**	37-127		5/9/2018 18:23	
p-Terphenyl-d14 (S)	**117**		**%**	**1**	42-141		5/9/2018 18:23	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**24000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**24000**	**J4**	**mg/Kg**	**10**	5100	4100	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1200**	**U,J4**	**mg/Kg**	**10**	1300	1200	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856010** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **738-739 Cat-Pont Fine roots w/** Date Collected: 05/01/18 00:00

Results for sample M1801856010 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate + Nitrite	**28**	**I,J4**	**mg/Kg**	**1**	64	6.4	5/14/2018 17:08	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**72000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**93**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856011** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **746 Pont Elm Fine Root W/ Loos** Date Collected: 05/01/18 00:00

Results for sample M1801856011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.40**	**U**	**mg/Kg**	**1**	2.2	0.40	5/16/2018 16:53	M
Arsenic	**2.9**	**I**	**mg/Kg**	**1**	6.7	0.47	5/16/2018 16:53	M
Beryllium	**0.089**	**I**	**mg/Kg**	**1**	0.22	0.026	5/16/2018 16:53	M
Cadmium	**0.18**	**I**	**mg/Kg**	**1**	1.1	0.037	5/16/2018 16:53	M
Chromium	**2.8**		**mg/Kg**	**1**	1.1	0.80	5/16/2018 16:53	M
Copper	**15**	**I**	**mg/Kg**	**1**	22	0.66	5/16/2018 16:53	M
Lead	**5.9**		**mg/Kg**	**1**	2.2	0.23	5/16/2018 16:53	M
Nickel	**3.4**	**I**	**mg/Kg**	**1**	11	0.53	5/16/2018 16:53	M
Zinc	**51**		**mg/Kg**	**1**	11	1.8	5/16/2018 16:53	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.061**		**mg/Kg**	**1**	0.024	0.0033	5/7/2018 15:35	J
METALS, SPLP								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856011** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **746 Pont Elm Fine Root W/ Loos** Date Collected: 05/01/18 00:00

Results for sample M1801856011 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.10**	I	**mg/L**	**1**	0.20	0.080	5/16/2018 19:18	M
Copper	**0.0049**	I	**mg/L**	**1**	0.0080	0.0025	5/16/2018 19:18	M
Lead	**0.0012**	I	**mg/L**	**1**	0.0070	0.0011	5/16/2018 19:18	M
Zinc	**0.0076**	I	**mg/L**	**1**	0.010	0.0050	5/16/2018 19:18	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.048**	U	**mg/Kg**	**5**	0.19	0.048	5/9/2018 18:50	M
Phenanthrene	**0.049**	U	**mg/Kg**	**5**	0.19	0.049	5/9/2018 18:50	M
Nitrobenzene-d5 (S)	**132**		**%**	**5**	33-134		5/9/2018 18:50	
2-Fluorobiphenyl (S)	**102**		**%**	**5**	37-127		5/9/2018 18:50	
p-Terphenyl-d14 (S)	**130**		**%**	**5**	42-141		5/9/2018 18:50	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**12000**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**12000**		**mg/Kg**	**10**	1500	1200	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**350**	U	**mg/Kg**	**10**	370	350	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**70**		**mg/Kg**	**1**	23	2.3	5/18/2018 01:07	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**210000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856011** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **746 Pont Elm Fine Root W/ Loos** Date Collected: 05/01/18 00:00
Results for sample M1801856011 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Percent Moisture	**79**		**%**	**1**			5/4/2018 21:19	M

Lab ID: **M1801856012** Date Received: 05/04/18 11:05 Matrix: Soil
Sample ID: **661 Ponds Runny Muck** Date Collected: 04/30/18 00:00
Results for sample M1801856012 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.69**	**U**	**mg/Kg**	**1**	3.9	0.69	5/21/2018 16:55	M
Arsenic	**9.5**	**I**	**mg/Kg**	**1**	12	0.81	5/21/2018 16:55	M
Beryllium	**0.62**		**mg/Kg**	**1**	0.39	0.046	5/21/2018 16:55	M
Cadmium	**0.46**	**I**	**mg/Kg**	**1**	1.9	0.065	5/21/2018 16:55	M
Chromium	**18**		**mg/Kg**	**1**	1.9	1.4	5/21/2018 16:55	M
Copper	**12**	**I,V**	**mg/Kg**	**1**	39	1.1	5/21/2018 16:55	M
Lead	**3.4**	**I**	**mg/Kg**	**1**	3.9	0.40	5/21/2018 16:55	M
Nickel	**7.4**	**I**	**mg/Kg**	**1**	19	0.91	5/21/2018 16:55	M
Zinc	**12**	**I**	**mg/Kg**	**1**	19	3.1	5/21/2018 16:55	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.079**		**mg/Kg**	**1**	0.040	0.0056	5/7/2018 15:38	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.30**		**mg/L**	**1**	0.20	0.080	5/16/2018 19:21	M
Copper	**0.0025**	**U**	**mg/L**	**1**	0.0080	0.0025	5/16/2018 19:21	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/16/2018 19:21	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/16/2018 19:21	M
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801856 SFEC Nutrient Count

Lab ID: **M1801856012** Date Received: 05/04/18 11:05 Matrix: Soil

Sample ID: **661 Ponds Runny Muck** Date Collected: 04/30/18 00:00

Results for sample M1801856012 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.017**	**U**	**mg/Kg**	**1**	0.066	0.017	5/9/2018 19:16	M
Phenanthrene	**0.017**	**U**	**mg/Kg**	**1**	0.066	0.017	5/9/2018 19:16	M
Nitrobenzene-d5 (S)	**111**		**%**	**1**	33-134		5/9/2018 19:16	
2-Fluorobiphenyl (S)	**86**		**%**	**1**	37-127		5/9/2018 19:16	
p-Terphenyl-d14 (S)	**117**		**%**	**1**	42-141		5/9/2018 19:16	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**6900**		**mg/Kg**	**1**	0.10	0.10	5/23/2018 16:36	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**6900**		**mg/Kg**	**10**	2300	1800	5/21/2018 15:43	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**540**	**U**	**mg/Kg**	**10**	570	540	5/21/2018 15:43	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**15**	**I**	**mg/Kg**	**1**	40	4.0	5/18/2018 02:27	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**120000**		**mg/Kg**	**1**			5/8/2018 12:01	M
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**88**		**%**	**1**			5/4/2018 21:19	M

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ANALYTICAL RESULTS QUALIFIERS

Workorder: M1801856 SFEC Nutrient Count

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.
V	Method Blank Contamination
J4	Estimated Result

LAB QUALIFIERS

J	DOH Certification #E82574(AEL-JAX)(FL NELAC Certification)
M	DOH Certification #E82535(AEL-M)(FL NELAC Certification)
M^	Not Certified

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QUALITY CONTROL DATA

Workorder: M1801856 SFEC Nutrient Count

QC Batch: DGMj/1492 Analysis Method: SW-846 7471A
QC Batch Method: SW-846 7471A Prepared: 05/07/2018 11:30
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2703858

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Mercury	mg/Kg	0.00070	0.00070	U

QC Batch: EXTm/1426 Analysis Method: SW-846 8270C (SIM)
QC Batch Method: SW-846 3550B Prepared: 05/08/2018 08:00
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2705240

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
SEMIVOLATILES				
Phenanthrene	mg/Kg	0.0020	0.0020	U
Fluoranthene	mg/Kg	0.0020	0.0020	U
Nitrobenzene-d5 (S)	%	117	33-134	
2-Fluorobiphenyl (S)	%	88	37-127	
p-Terphenyl-d14 (S)	%	109	42-141	

QC Batch: WCAm/2309 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Prepared:
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004

QC Batch: WCAm/2310 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Prepared:
Associated Lab Samples: M1801856005, M1801856006, M1801856007, M1801856008, M1801856009, M1801856010, M1801856011,

QC Batch: DGMm/1299 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3050B Prepared: 05/11/2018 11:30
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2710239

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				

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QUALITY CONTROL DATA

Workorder: M1801856 SFEC Nutrient Count

METHOD BLANK: 2710239

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Arsenic	mg/Kg	0.10	0.10	U
Beryllium	mg/Kg	0.0058	0.0058	U
Cadmium	mg/Kg	0.0082	0.0082	U
Chromium	mg/Kg	0.18	0.18	U
Copper	mg/Kg	0.15	0.15	U
Nickel	mg/Kg	0.12	0.12	U
Lead	mg/Kg	0.051	0.051	U
Antimony	mg/Kg	0.088	0.088	U
Zinc	mg/Kg	0.39	0.39	U

QC Batch: DGMm/1304 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 05/15/2018 04:00
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004

METHOD BLANK: 2715052

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Aluminum	mg/L	0.080	0.080	U
Copper	mg/L	0.0025	0.0025	U
Lead	mg/L	0.0011	0.0011	U
Zinc	mg/L	0.0050	0.0050	U

QC Batch: DGMm/1306 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 05/15/2018 10:45
Associated Lab Samples: M1801856005, M1801856006, M1801856007, M1801856008, M1801856009, M1801856010, M1801856011,

METHOD BLANK: 2715060

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Aluminum	mg/L	0.080	0.080	U
Copper	mg/L	0.0025	0.0025	U
Lead	mg/L	0.0011	0.0011	U
Zinc	mg/L	0.0050	0.0050	U

QC Batch: DGMm/1311 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3050B Prepared: 05/18/2018 10:00
Associated Lab Samples: M1801856012

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QUALITY CONTROL DATA

Workorder: M1801856 SFEC Nutrient Count

METHOD BLANK: 2718870

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Arsenic	mg/Kg	0.10	0.10	U
Beryllium	mg/Kg	0.0057	0.0057	U
Cadmium	mg/Kg	0.0081	0.0081	U
Chromium	mg/Kg	0.17	0.17	U
Copper	mg/Kg	0.35	0.14	I
Nickel	mg/Kg	0.11	0.11	U
Lead	mg/Kg	0.050	0.050	U
Antimony	mg/Kg	0.086	0.086	U
Zinc	mg/Kg	0.38	0.38	U

QC Batch: WCAm/2452 Analysis Method: EPA 351.2
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/17/2018 09:34
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2719668

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	33	33	U

METHOD BLANK: 2719669

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	10	10	U

QC Batch: WCAm/2452 Analysis Method: EPA 365.4
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/17/2018 09:34
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2719668

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	33	33	U

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QUALITY CONTROL DATA

Workorder: M1801856 SFEC Nutrient Count

METHOD BLANK: 2719668

METHOD BLANK: 2719669

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	10	10	U

QC Batch: WCAm/2455 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: M1801856008, M1801856009, M1801856011, M1801856012

METHOD BLANK: 2720049

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Nitrate + Nitrite	mg/Kg	0.50	0.50	U

QC Batch: WCAm/2456 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: M1801856001, M1801856002, M1801856003, M1801856004, M1801856005, M1801856006, M1801856007,

METHOD BLANK: 2720078

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Nitrate + Nitrite	mg/Kg	0.50	0.50	U

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QUALITY CONTROL DATA QUALIFIERS

Workorder: M1801856 SFEC Nutrient Count

QUALITY CONTROL 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
V	Method Blank Contamination

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801856001	626-627 Root Fiber W/Mulch			SM 2540G	WCAm/2283
M1801856002	629 Myrium			SM 2540G	WCAm/2283
M1801856003	630 Myrian Island Fine Root +			SM 2540G	WCAm/2283
M1801856004	633 Cattail-Fine Roots W/Muck			SM 2540G	WCAm/2283
M1801856005	678 Pads vg W/Loose Muck			SM 2540G	WCAm/2284
M1801856006	684 Cattail Fine Roots W/Loose			SM 2540G	WCAm/2284
M1801856007	691 Willows Point			SM 2540G	WCAm/2284
M1801856008	718 N Fine Roots W/Muck			SM 2540G	WCAm/2284
M1801856009	723-724 Cat Fine Roots Loose k			SM 2540G	WCAm/2284
M1801856010	738-739 Cat-Pont Fine roots w/			SM 2540G	WCAm/2284
M1801856011	746 Pont Elm Fine Root W/ Loos			SM 2540G	WCAm/2284
M1801856012	661 Ponds Runny Muck			SM 2540G	WCAm/2284
M1801856001	626-627 Root Fiber W/Mulch	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856002	629 Myrium	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856003	630 Myrian Island Fine Root +	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856004	633 Cattail-Fine Roots W/Muck	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856005	678 Pads vg W/Loose Muck	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856006	684 Cattail Fine Roots W/Loose	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856007	691 Willows Point	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856008	718 N Fine Roots W/Muck	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856009	723-724 Cat Fine Roots Loose k	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856010	738-739 Cat-Pont Fine roots w/	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856011	746 Pont Elm Fine Root W/ Loos	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856012	661 Ponds Runny Muck	SW-846 7471A	DGMj/1492	SW-846 7471A	CVAj/1121
M1801856001	626-627 Root Fiber W/Mulch	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856002	629 Myrium	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801856003	630 Myrian Island Fine Root +	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856004	633 Cattail-Fine Roots W/Muck	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856005	678 Pads vg W/Loose Muck	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856006	684 Cattail Fine Roots W/Loose	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856007	691 Willows Point	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856008	718 N Fine Roots W/Muck	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856009	723-724 Cat Fine Roots Loose k	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856010	738-739 Cat-Pont Fine roots w/	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856011	746 Pont Elm Fine Root W/ Loos	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856012	661 Ponds Runny Muck	SW-846 3550B	EXTm/1426	SW-846 8270C (SIM)	MSSm/1178
M1801856001	626-627 Root Fiber W/Mulch			SM 2540G	WCAm/2309
M1801856002	629 Myrium			SM 2540G	WCAm/2309
M1801856003	630 Myrian Island Fine Root +			SM 2540G	WCAm/2309
M1801856004	633 Cattail-Fine Roots W/Muck			SM 2540G	WCAm/2309
M1801856005	678 Pads vg W/Loose Muck			SM 2540G	WCAm/2310
M1801856006	684 Cattail Fine Roots W/Loose			SM 2540G	WCAm/2310
M1801856007	691 Willows Point			SM 2540G	WCAm/2310
M1801856008	718 N Fine Roots W/Muck			SM 2540G	WCAm/2310
M1801856009	723-724 Cat Fine Roots Loose k			SM 2540G	WCAm/2310
M1801856010	738-739 Cat-Pont Fine roots w/			SM 2540G	WCAm/2310
M1801856011	746 Pont Elm Fine Root W/ Loos			SM 2540G	WCAm/2310
M1801856012	661 Ponds Runny Muck			SM 2540G	WCAm/2310
M1801856001	626-627 Root Fiber W/Mulch	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856002	629 Myrium	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856003	630 Myrian Island Fine Root +	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856004	633 Cattail-Fine Roots W/Muck	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801856005	678 Pads vg W/Loose Muck	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856006	684 Cattail Fine Roots W/Loose	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856007	691 Willows Point	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856008	718 N Fine Roots W/Muck	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856009	723-724 Cat Fine Roots Loose k	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856010	738-739 Cat-Pont Fine roots w/	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856011	746 Pont Elm Fine Root W/ Loos	SW-846 3050B	DGMm/1299	SW-846 6010	ICPm/1308
M1801856001	626-627 Root Fiber W/Mulch	SW-846 3010A	DGMm/1304	SW-846 6010	ICPm/1314
M1801856002	629 Myrium	SW-846 3010A	DGMm/1304	SW-846 6010	ICPm/1314
M1801856003	630 Myrian Island Fine Root +	SW-846 3010A	DGMm/1304	SW-846 6010	ICPm/1314
M1801856004	633 Cattail-Fine Roots W/Muck	SW-846 3010A	DGMm/1304	SW-846 6010	ICPm/1314
M1801856005	678 Pads vg W/Loose Muck	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856006	684 Cattail Fine Roots W/Loose	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856007	691 Willows Point	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856008	718 N Fine Roots W/Muck	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856009	723-724 Cat Fine Roots Loose k	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856010	738-739 Cat-Pont Fine roots w/	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856011	746 Pont Elm Fine Root W/ Loos	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856012	661 Ponds Runny Muck	SW-846 3010A	DGMm/1306	SW-846 6010	ICPm/1316
M1801856012	661 Ponds Runny Muck	SW-846 3050B	DGMm/1311	SW-846 6010	ICPm/1321
M1801856001	626-627 Root Fiber W/Mulch	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856002	629 Myrium	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856003	630 Myrian Island Fine Root +	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856004	633 Cattail-Fine Roots W/Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856005	678 Pads vg W/Loose Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801856006	684 Cattail Fine Roots W/Loose	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856007	691 Willows Point	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856008	718 N Fine Roots W/Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856009	723-724 Cat Fine Roots Loose k	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856010	738-739 Cat-Pont Fine roots w/	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856011	746 Pont Elm Fine Root W/ Loos	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856012	661 Ponds Runny Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 365.4	WCAm/2453
M1801856001	626-627 Root Fiber W/Mulch	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856002	629 Myrium	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856003	630 Myrian Island Fine Root +	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856004	633 Cattail-Fine Roots W/Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856005	678 Pads vg W/Loose Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856006	684 Cattail Fine Roots W/Loose	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856007	691 Willows Point	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856008	718 N Fine Roots W/Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856009	723-724 Cat Fine Roots Loose k	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856010	738-739 Cat-Pont Fine roots w/	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856011	746 Pont Elm Fine Root W/ Loos	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856012	661 Ponds Runny Muck	Copper Sulfate Digestion Solid	WCAm/2452	EPA 351.2	WCAm/2454
M1801856008	718 N Fine Roots W/Muck			EPA 9056	WCAm/2455
M1801856009	723-724 Cat Fine Roots Loose k			EPA 9056	WCAm/2455
M1801856011	746 Pont Elm Fine Root W/ Loos			EPA 9056	WCAm/2455
M1801856012	661 Ponds Runny Muck			EPA 9056	WCAm/2455
M1801856001	626-627 Root Fiber W/Mulch			EPA 9056	WCAm/2456
M1801856002	629 Myrium			EPA 9056	WCAm/2456

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801856 SFEC Nutrient Count

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801856003	630 Myrian Island Fine Root +			EPA 9056	WCAm/2456
M1801856004	633 Cattail-Fine Roots W/Muck			EPA 9056	WCAm/2456
M1801856005	678 Pads vg W/Loose Muck			EPA 9056	WCAm/2456
M1801856006	684 Cattail Fine Roots W/Loose			EPA 9056	WCAm/2456
M1801856007	691 Willows Point			EPA 9056	WCAm/2456
M1801856010	738-739 Cat-Pont Fine roots w/			EPA 9056	WCAm/2456
M1801856001	626-627 Root Fiber W/Mulch	Calculation	CLCm/	Calculation	CLCm/
M1801856002	629 Myrium	Calculation	CLCm/	Calculation	CLCm/
M1801856003	630 Myrian Island Fine Root +	Calculation	CLCm/	Calculation	CLCm/
M1801856004	633 Cattail-Fine Roots W/Muck	Calculation	CLCm/	Calculation	CLCm/
M1801856005	678 Pads vg W/Loose Muck	Calculation	CLCm/	Calculation	CLCm/
M1801856006	684 Cattail Fine Roots W/Loose	Calculation	CLCm/	Calculation	CLCm/
M1801856007	691 Willows Point	Calculation	CLCm/	Calculation	CLCm/
M1801856008	718 N Fine Roots W/Muck	Calculation	CLCm/	Calculation	CLCm/
M1801856009	723-724 Cat Fine Roots Loose k	Calculation	CLCm/	Calculation	CLCm/
M1801856010	738-739 Cat-Pont Fine roots w/	Calculation	CLCm/	Calculation	CLCm/
M1801856011	746 Pont Elm Fine Root W/ Loos	Calculation	CLCm/	Calculation	CLCm/
M1801856012	661 Ponds Runny Muck	Calculation	CLCm/	Calculation	CLCm/

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M1801856

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☐ Tampa: 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

Client Name: Andrew Gottlieb
Address: 30 S M Street
Lake Worth, FL 33460
Phone: 561-635-4374
FAX:
Contact:
Sampled By: A Gottlieb, M Adlas
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: SFEC Nutrient Cont.
Project Number:
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

BOTTLE SIZE & TYPE
ANALYSIS REQUIRED
Preservation
Field-Filtered?

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	LABORATORY I.D. NUMBER
626-627	Root fiber w/ muck	Comp	4-30		veg/soil		001
629	Myrica fine roots + soil	Grab	4-30		veg/soil		002
630	Myrica Isle fine root + soil	Comp	4-30		veg/soil		003
633	Cattail - fine roots w muck	Grab			veg/soil		004
678	Roots veg w loose muck	Comp	5-1		veg/soil		005
684	Cattail fine roots w loose muck	Comp	5-1		veg/soil		006
691	Willow Pent	Comp	5-1		pent/soil		007
718 N	Vetiver fine roots w muck	Comp	5-2		veg/soil		008
723-724	Cat fine roots w loose muck	Comp	5-2		veg/soil		009
738-739	Cat-Pent fine roots w muck	Comp	5-2		veg/soil		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) 4.1 °C

DCN: AD-051 Form last revised 06/19/2017

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]	5/4/18	1105	[signature]	5/4/18	1105
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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Tampa: 9610 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

Client Name: Andrew Gottlieb
Address: 30 S M Street
Lake Worth, FL 33460
Phone: 561 635-4374
FAX:
Contact:
Sampled By:
Turn Around Time: ☑ STANDARD ☐ RUSH
AEL Profile #:

Project Name: SFEC Natural Cont.
Project Number:
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions:
☐ ADaPT ☐ EQuIS ☐ Other

BOTTLE SIZE & TYPE
ANALYSIS REQUIRED
Preservation
Field-Filtered?

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT	LABORATORY I.D. NUMBER
741	Point-Elm flowcrest w/ leaf muck	Grab	5-2		Veg/ Soil		011
~~661~~	~~Rabbs Bunny Muck~~						
661	Rabbs Bunny Muck	Grab	4-30		Soil		012

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 (accepted) 4 °C

DCN: AD-051 Form last revised 06/19/2017

Device used for measuring Temp by unique identifier (circle IR temp gun used) J: 9A G: LT-1 LT-2 T: 10A A: 3A I: 3A S: 1V F: 1A

	Relinquished by:	Date	Time	Received by:	Date	Time
1	[signature]	5/4/18	1105	[signature]	5/4/18	1105
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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6681 Southpoint Parkway
Jacksonville, Florida 32216
Office (904) 363-9350
Fax (904) 363-9354

Queue: WCAm

Batch Number: 2456

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: The analysis of F1802348001 and F1802371001 was initially performed past the recommended holding time. An internal laboratory failure occurred which resulted in the missed holding time. Efforts were made to analyze the sample as soon as the error was identified. The data is qualified to indicate the holding time violation.

III. Method

Analysis: EPA 9056

Preparation: None

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike recoveries of NOx for M1801856010 were outside control criteria due to the presence of target analytes in the sample. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

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Fax (904) 363-9354

Queue: WCAm

Batch Number: 2454

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: EPA 351.2

Preparation: Copper Sulfate Digestion Solid

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike recoveries of TKN for [SAMPLE] were outside control criteria due to the presence of target analytes in the sample. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

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Jacksonville, Florida 32216
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Fax (904) 363-9354

Queue: WCAm

Batch Number: 2453

I. Receipt

No Exceptions were encountered.

II. Holding Times

Preparation: All holding times were met.

Analysis: All holding times were met.

III. Method

Analysis: EPA 365.4

Preparation: Copper Sulfate Digestion Solid

IV. Preparation

Sample preparation proceeded normally.

V. Analysis

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Duplicates: All acceptance criteria were met.

D. Spikes: The matrix spike recoveries of TP for M1801856010 and F1802348001 were outside control criteria due to the presence of target analytes in the sample. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential high bias in this matrix. The affected sample is qualified to indicate matrix interference.

E. Serial Diluion: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

G. Other:

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June 19, 2018

Andrew Gottlieb
South Florida Engineering & Consultants
30 South M Street
Lake Worth, FL 33460

RE: Workorder: M1801972 SFEC Nutrient Center

Dear Andrew Gottlieb:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, May 15, 2018. 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,

Tiffany Mackie

Tiffany Mackie - Client Services Manager
TMackie@AELLab.com

Enclosures

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SAMPLE SUMMARY

Workorder: M1801972 SFEC Nutrient Center

Lab ID	Sample ID	Matrix	Date Collected	Date Received
M1801972001	805 Nu Fine roots w/loose muck	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972002	820 Co Fine roots w/loose muck	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972003	822 P-C muck with fine roots	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972004	824-825 fine roots w/loose muc	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972005	827-830	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972006	833 W-1	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972007	817-818 fine roots w/loose muc	Soil	5/8/2018 00:00	5/15/2018 13:10
M1801972008	837-840 fine roots with muck	Soil	5/8/2018 00:00	5/15/2018 13:10

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972001** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **805 Nu Fine roots w/loose muck** Date Collected: 05/08/18 00:00

Results for sample M1801972001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.2**	**U**	**mg/Kg**	**1**	12	2.2	5/29/2018 15:05	M
Arsenic	**2.6**	**U**	**mg/Kg**	**1**	37	2.6	5/29/2018 15:05	M
Beryllium	**0.15**	**U**	**mg/Kg**	**1**	1.2	0.15	5/29/2018 15:05	M
Cadmium	**0.21**	**U**	**mg/Kg**	**1**	6.2	0.21	5/29/2018 15:05	M
Chromium	**4.8**	**I**	**mg/Kg**	**1**	6.2	4.4	5/29/2018 15:05	M
Copper	**21**	**I**	**mg/Kg**	**1**	120	3.7	5/30/2018 14:48	M
Lead	**6.2**	**I**	**mg/Kg**	**1**	12	1.3	5/29/2018 15:05	M
Nickel	**4.6**	**I**	**mg/Kg**	**1**	62	2.9	5/29/2018 15:05	M
Zinc	**41**	**I**	**mg/Kg**	**1**	62	9.7	5/29/2018 15:05	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.056**	**I**	**mg/Kg**	**1**	0.12	0.017	5/18/2018 13:07	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/29/2018 13:17	M
Copper	**0.0052**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 10:52	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:17	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:17	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.23**	**U**	**mg/Kg**	**5**	0.93	0.23	5/23/2018 20:03	M
Phenanthrene	**0.24**	**U**	**mg/Kg**	**5**	0.93	0.24	5/23/2018 20:03	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/23/2018 20:03	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/23/2018 20:03	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/23/2018 20:03	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**10000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:39	M^

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972001** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **805 Nu Fine roots w/loose muck** Date Collected: 05/08/18 00:00

Results for sample M1801972001 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**10000**		**mg/Kg**	**10**	7800	6200	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**1900**	**U**	**mg/Kg**	**10**	1900	1900	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**24**	**U**	**mg/Kg**	**1**	240	24	5/23/2018 13:24	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**41000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**96**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972002** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **820 Co Fine roots w/loose muck** Date Collected: 05/08/18 00:00

Results for sample M1801972002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.1**	**U**	**mg/Kg**	**1**	5.8	1.1	5/29/2018 15:09	M
Arsenic	**2.5**	**I**	**mg/Kg**	**1**	18	1.2	5/29/2018 15:09	M
Beryllium	**0.12**	**I**	**mg/Kg**	**1**	0.58	0.069	5/29/2018 15:09	M
Cadmium	**0.23**	**I**	**mg/Kg**	**1**	2.9	0.098	5/29/2018 15:09	M
Chromium	**6.1**		**mg/Kg**	**1**	2.9	2.1	5/29/2018 15:09	M
Copper	**17**	**I**	**mg/Kg**	**1**	58	1.7	5/30/2018 14:56	M
Lead	**10**		**mg/Kg**	**1**	5.8	0.61	5/29/2018 15:09	M

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972002** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **820 Co Fine roots w/loose muck** Date Collected: 05/08/18 00:00

Results for sample M1801972002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nickel	**4.1**	**I**	**mg/Kg**	**1**	29	1.4	5/29/2018 15:09	M
Zinc	**25**	**I**	**mg/Kg**	**1**	29	4.6	5/29/2018 15:09	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.093**		**mg/Kg**	**1**	0.059	0.0083	5/18/2018 13:11	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.12**	**I**	**mg/L**	**1**	0.20	0.080	5/29/2018 13:25	M
Copper	**0.0065**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 10:56	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:25	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:25	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.12**		**mg/Kg**	**1**	0.098	0.024	5/23/2018 20:30	M
Phenanthrene	**0.14**		**mg/Kg**	**1**	0.098	0.025	5/23/2018 20:30	M
Nitrobenzene-d5 (S)	**107**		**%**	**1**	33-134		5/23/2018 20:30	
2-Fluorobiphenyl (S)	**73**		**%**	**1**	37-127		5/23/2018 20:30	
p-Terphenyl-d14 (S)	**92**		**%**	**1**	42-141		5/23/2018 20:30	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**12000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:39	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**12000**		**mg/Kg**	**10**	2200	1800	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**530**	**U**	**mg/Kg**	**10**	550	530	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972002** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **820 Co Fine roots w/loose muck** Date Collected: 05/08/18 00:00

Results for sample M1801972002 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate + Nitrite	**40**	**I**	**mg/Kg**	**1**	110	11	5/23/2018 14:24	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**83000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**92**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972003** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **822 P-C muck with fine roots** Date Collected: 05/08/18 00:00

Results for sample M1801972003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.71**	**U**	**mg/Kg**	**1**	4.0	0.71	5/29/2018 15:13	M
Arsenic	**2.1**	**I**	**mg/Kg**	**1**	12	0.83	5/29/2018 15:13	M
Beryllium	**0.047**	**U**	**mg/Kg**	**1**	0.40	0.047	5/29/2018 15:13	M
Cadmium	**0.16**	**I**	**mg/Kg**	**1**	2.0	0.066	5/29/2018 15:13	M
Chromium	**3.4**		**mg/Kg**	**1**	2.0	1.4	5/29/2018 15:13	M
Copper	**13**	**I**	**mg/Kg**	**1**	40	1.2	5/30/2018 14:59	M
Lead	**5.9**		**mg/Kg**	**1**	4.0	0.41	5/29/2018 15:13	M
Nickel	**2.8**	**I**	**mg/Kg**	**1**	20	0.93	5/29/2018 15:13	M
Zinc	**29**		**mg/Kg**	**1**	20	3.1	5/29/2018 15:13	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.087**		**mg/Kg**	**1**	0.039	0.0054	5/18/2018 13:14	J
METALS, SPLP								

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972003** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **822 P-C muck with fine roots** Date Collected: 05/08/18 00:00

Results for sample M1801972003 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.086**	I	**mg/L**	**1**	0.20	0.080	5/29/2018 13:29	M
Copper	**0.0045**	I	**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:24	M
Lead	**0.0011**	U	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:29	M
Zinc	**0.0050**	I	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:29	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.082**	U	**mg/Kg**	**5**	0.33	0.082	5/23/2018 20:57	M
Phenanthrene	**0.084**	U	**mg/Kg**	**5**	0.33	0.084	5/23/2018 20:57	M
Nitrobenzene-d5 (S)	**0**	1	**%**	**5**	33-134		5/23/2018 20:57	
2-Fluorobiphenyl (S)	**0**	1	**%**	**5**	37-127		5/23/2018 20:57	
p-Terphenyl-d14 (S)	**0**	1	**%**	**5**	42-141		5/23/2018 20:57	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**14000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:40	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**14000**		**mg/Kg**	**10**	1700	1400	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**420**	U	**mg/Kg**	**10**	440	420	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**33**	I	**mg/Kg**	**1**	72	7.2	5/23/2018 14:44	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**120000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972003** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **822 P-C muck with fine roots** Date Collected: 05/08/18 00:00
Results for sample M1801972003 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Percent Moisture	**88**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972004** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **824-825 fine roots w/loose muc** Date Collected: 05/08/18 00:00
Results for sample M1801972004 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.9**	**U**	**mg/Kg**	**1**	11	1.9	5/29/2018 15:16	M
Arsenic	**2.2**	**U**	**mg/Kg**	**1**	32	2.2	5/29/2018 15:16	M
Beryllium	**0.13**	**U**	**mg/Kg**	**1**	1.1	0.13	5/29/2018 15:16	M
Cadmium	**0.18**	**U**	**mg/Kg**	**1**	5.3	0.18	5/29/2018 15:16	M
Chromium	**6.1**		**mg/Kg**	**1**	5.3	3.8	5/29/2018 15:16	M
Copper	**21**	**I**	**mg/Kg**	**1**	110	3.2	5/30/2018 15:03	M
Lead	**4.6**	**I**	**mg/Kg**	**1**	11	1.1	5/29/2018 15:16	M
Nickel	**3.8**	**I**	**mg/Kg**	**1**	53	2.5	5/29/2018 15:16	M
Zinc	**28**	**I**	**mg/Kg**	**1**	53	8.4	5/29/2018 15:16	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.060**	**I**	**mg/Kg**	**1**	0.11	0.015	5/18/2018 13:17	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/29/2018 13:32	M
Copper	**0.0088**		**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:28	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:32	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:32	M
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972004** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **824-825 fine roots w/loose muc** Date Collected: 05/08/18 00:00

Results for sample M1801972004 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.21**	**U**	**mg/Kg**	**5**	0.86	0.21	5/23/2018 21:23	M
Phenanthrene	**0.22**	**U**	**mg/Kg**	**5**	0.86	0.22	5/23/2018 21:23	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/23/2018 21:23	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/23/2018 21:23	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/23/2018 21:23	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**17000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:40	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**17000**		**mg/Kg**	**10**	4000	3200	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**970**	**U**	**mg/Kg**	**10**	1000	970	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**21**	**U**	**mg/Kg**	**1**	210	21	5/23/2018 14:04	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**46000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**95**		**%**	**1**			5/17/2018 15:16	M

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972005** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **827-830** Date Collected: 05/08/18 00:00

Results for sample M1801972005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.1**	**U**	**mg/Kg**	**1**	12	2.1	5/29/2018 15:20	M
Arsenic	**2.4**	**U**	**mg/Kg**	**1**	35	2.4	5/29/2018 15:20	M
Beryllium	**0.14**	**U**	**mg/Kg**	**1**	1.2	0.14	5/29/2018 15:20	M
Cadmium	**0.19**	**U**	**mg/Kg**	**1**	5.8	0.19	5/29/2018 15:20	M
Chromium	**4.1**	**U**	**mg/Kg**	**1**	5.8	4.1	5/29/2018 15:20	M
Copper	**14**	**I**	**mg/Kg**	**1**	120	3.4	5/30/2018 15:07	M
Lead	**1.2**	**U**	**mg/Kg**	**1**	12	1.2	5/29/2018 15:20	M
Nickel	**2.7**	**U**	**mg/Kg**	**1**	58	2.7	5/29/2018 15:20	M
Zinc	**26**	**I**	**mg/Kg**	**1**	58	9.1	5/29/2018 15:20	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.051**	**I**	**mg/Kg**	**1**	0.12	0.017	5/18/2018 13:20	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/29/2018 13:36	M
Copper	**0.0050**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:31	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:36	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:36	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.25**	**U**	**mg/Kg**	**5**	0.98	0.25	5/23/2018 21:50	M
Phenanthrene	**0.25**	**U**	**mg/Kg**	**5**	0.98	0.25	5/23/2018 21:50	M
Nitrobenzene-d5 (S)	**0**	**1**	**%**	**5**	33-134		5/23/2018 21:50	
2-Fluorobiphenyl (S)	**0**	**1**	**%**	**5**	37-127		5/23/2018 21:50	
p-Terphenyl-d14 (S)	**0**	**1**	**%**	**5**	42-141		5/23/2018 21:50	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**17000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:41	M^

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972005** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **827-830** Date Collected: 05/08/18 00:00

Results for sample M1801972005 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**17000**		**mg/Kg**	**10**	3600	2800	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**380**		**mg/Kg**	**1**	89	85	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**24**	**U**	**mg/Kg**	**1**	240	24	5/23/2018 13:44	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**41000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**96**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972006** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **833 W-1** Date Collected: 05/08/18 00:00

Results for sample M1801972006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**0.96**	**U**	**mg/Kg**	**1**	5.3	0.96	5/29/2018 15:24	M
Arsenic	**1.5**	**I**	**mg/Kg**	**1**	16	1.1	5/29/2018 15:24	M
Beryllium	**0.063**	**U**	**mg/Kg**	**1**	0.53	0.063	5/29/2018 15:24	M
Cadmium	**0.090**	**U**	**mg/Kg**	**1**	2.7	0.090	5/29/2018 15:24	M
Chromium	**3.0**		**mg/Kg**	**1**	2.7	1.9	5/29/2018 15:24	M
Copper	**18**	**I**	**mg/Kg**	**1**	53	1.6	5/30/2018 15:10	M
Lead	**3.3**	**I**	**mg/Kg**	**1**	5.3	0.56	5/29/2018 15:24	M

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972006** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **833 W-1** Date Collected: 05/08/18 00:00

Results for sample M1801972006 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nickel	**2.4**	**I**	**mg/Kg**	**1**	27	1.3	5/29/2018 15:24	M
Zinc	**21**	**I**	**mg/Kg**	**1**	27	4.2	5/29/2018 15:24	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.089**		**mg/Kg**	**1**	0.056	0.0078	5/18/2018 13:23	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.10**	**I**	**mg/L**	**1**	0.20	0.080	5/29/2018 13:54	M
Copper	**0.0073**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:35	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 13:54	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 13:54	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.022**	**U**	**mg/Kg**	**1**	0.087	0.022	5/23/2018 18:43	M
Phenanthrene	**0.022**	**U**	**mg/Kg**	**1**	0.087	0.022	5/23/2018 18:43	M
Nitrobenzene-d5 (S)	**114**		**%**	**1**	33-134		5/23/2018 18:43	
2-Fluorobiphenyl (S)	**79**		**%**	**1**	37-127		5/23/2018 18:43	
p-Terphenyl-d14 (S)	**99**		**%**	**1**	42-141		5/23/2018 18:43	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**22000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:42	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**22000**		**mg/Kg**	**10**	2600	2100	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**680**		**mg/Kg**	**1**	66	63	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972006** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **833 W-1** Date Collected: 05/08/18 00:00
Results for sample M1801972006 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Nitrate + Nitrite	**12**	**U**	**mg/Kg**	**1**	120	12	5/23/2018 15:04	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**87000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**91**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972007** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **817-818 fine roots w/loose muc** Date Collected: 05/08/18 00:00
Results for sample M1801972007 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**2.1**	**U**	**mg/Kg**	**1**	12	2.1	5/29/2018 15:42	M
Arsenic	**2.4**	**U**	**mg/Kg**	**1**	35	2.4	5/29/2018 15:42	M
Beryllium	**0.14**	**U**	**mg/Kg**	**1**	1.2	0.14	5/29/2018 15:42	M
Cadmium	**0.19**	**U**	**mg/Kg**	**1**	5.8	0.19	5/29/2018 15:42	M
Chromium	**4.2**	**U**	**mg/Kg**	**1**	5.8	4.2	5/29/2018 15:42	M
Copper	**13**	**I**	**mg/Kg**	**1**	120	3.4	5/30/2018 15:14	M
Lead	**4.2**	**I**	**mg/Kg**	**1**	12	1.2	5/29/2018 15:42	M
Nickel	**2.7**	**U**	**mg/Kg**	**1**	58	2.7	5/29/2018 15:42	M
Zinc	**21**	**I**	**mg/Kg**	**1**	58	9.1	5/29/2018 15:42	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.12**		**mg/Kg**	**1**	0.11	0.015	5/18/2018 13:26	J
METALS, SPLP								

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972007** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **817-818 fine roots w/loose muc** Date Collected: 05/08/18 00:00

Results for sample M1801972007 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/29/2018 14:01	M
Copper	**0.0064**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:39	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 14:01	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 14:01	M
SEMIVOLATILES								
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.045**	**U**	**mg/Kg**	**1**	0.18	0.045	5/23/2018 19:10	M
Phenanthrene	**0.045**	**U**	**mg/Kg**	**1**	0.18	0.045	5/23/2018 19:10	M
Nitrobenzene-d5 (S)	**97**		**%**	**1**	33-134		5/23/2018 19:10	
2-Fluorobiphenyl (S)	**67**		**%**	**1**	37-127		5/23/2018 19:10	
p-Terphenyl-d14 (S)	**86**		**%**	**1**	42-141		5/23/2018 19:10	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**25000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:42	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**25000**		**mg/Kg**	**10**	6800	5400	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**220**		**mg/Kg**	**1**	170	160	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**20**	**U**	**mg/Kg**	**1**	200	20	5/23/2018 15:24	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**42000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972007** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **817-818 fine roots w/loose muc** Date Collected: 05/08/18 00:00
Results for sample M1801972007 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Percent Moisture	**96**		**%**	**1**			5/17/2018 15:16	M

Lab ID: **M1801972008** Date Received: 05/15/18 13:10 Matrix: Soil
Sample ID: **837-840 fine roots with muck** Date Collected: 05/08/18 00:00
Results for sample M1801972008 are reported on a dry weight basis.
Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
METALS								
Analysis Desc: SW846 6010B Analysis,Soils	Preparation Method: SW-846 3050B Analytical Method: SW-846 6010							
Antimony	**1.2**	**U**	**mg/Kg**	**1**	6.6	1.2	5/29/2018 15:45	M
Arsenic	**1.4**	**I**	**mg/Kg**	**1**	20	1.4	5/29/2018 15:45	M
Beryllium	**0.078**	**U**	**mg/Kg**	**1**	0.66	0.078	5/29/2018 15:45	M
Cadmium	**0.11**	**U**	**mg/Kg**	**1**	3.3	0.11	5/29/2018 15:45	M
Chromium	**2.4**	**U**	**mg/Kg**	**1**	3.3	2.4	5/29/2018 15:45	M
Copper	**8.2**	**I**	**mg/Kg**	**1**	66	2.0	5/30/2018 15:18	M
Lead	**2.2**	**I**	**mg/Kg**	**1**	6.6	0.69	5/29/2018 15:45	M
Nickel	**1.7**	**I**	**mg/Kg**	**1**	33	1.6	5/29/2018 15:45	M
Zinc	**9.2**	**I**	**mg/Kg**	**1**	33	5.2	5/29/2018 15:45	M
Analysis Desc: SW846 7471A Analysis, Soil	Preparation Method: SW-846 7471A Analytical Method: SW-846 7471A							
Mercury	**0.066**		**mg/Kg**	**1**	0.062	0.0086	5/18/2018 13:29	J
METALS, SPLP								
Analysis Desc: 1312/6010B Analysis,SPLP	Preparation Method: SW-846 3010A Analytical Method: SW-846 6010							
Aluminum	**0.080**	**U**	**mg/L**	**1**	0.20	0.080	5/29/2018 14:05	M
Copper	**0.0042**	**I**	**mg/L**	**1**	0.0080	0.0025	5/30/2018 11:42	M
Lead	**0.0011**	**U**	**mg/L**	**1**	0.0070	0.0011	5/29/2018 14:05	M
Zinc	**0.0050**	**U**	**mg/L**	**1**	0.010	0.0050	5/29/2018 14:05	M
SEMIVOLATILES								

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ANALYTICAL RESULTS

Workorder: M1801972 SFEC Nutrient Center

Lab ID: **M1801972008** Date Received: 05/15/18 13:10 Matrix: Soil

Sample ID: **837-840 fine roots with muck** Date Collected: 05/08/18 00:00

Results for sample M1801972008 are reported on a dry weight basis.

Sample Description: Location:

Parameters	Results	Qual	Units	DF	Adjusted PQL	Adjusted MDL	Analyzed	Lab
Analysis Desc: 8270C-SIM Analysis, Soil	Preparation Method: SW-846 3550B Analytical Method: SW-846 8270C (SIM)							
Fluoranthene	**0.025**	**U**	**mg/Kg**	**1**	0.099	0.025	5/23/2018 19:36	M
Phenanthrene	**0.025**	**U**	**mg/Kg**	**1**	0.099	0.025	5/23/2018 19:36	M
Nitrobenzene-d5 (S)	**133**		**%**	**1**	33-134		5/23/2018 19:36	
2-Fluorobiphenyl (S)	**90**		**%**	**1**	37-127		5/23/2018 19:36	
p-Terphenyl-d14 (S)	**106**		**%**	**1**	42-141		5/23/2018 19:36	
WET CHEMISTRY								
Analysis Desc: Total Nitrogen,Calculated,Solid	Analytical Method: Calculation							
Total Nitrogen	**16000**		**mg/Kg**	**1**	0.10	0.10	5/31/2018 08:43	M^
Analysis Desc: TKN,E351.2,Solids	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 351.2							
Total Kjeldahl Nitrogen	**16000**		**mg/Kg**	**10**	3300	2700	5/25/2018 17:04	M
Analysis Desc: Total Phosphorus,E365.4,Analysis	Preparation Method: Copper Sulfate Digestion Solid Analytical Method: EPA 365.4							
Total Phosphorus (as P)	**81**	**I**	**mg/Kg**	**1**	83	80	5/25/2018 17:04	M
Analysis Desc: 9056, Soil	Analytical Method: EPA 9056							
Nitrate + Nitrite	**12**	**U,J4**	**mg/Kg**	**1**	120	12	5/23/2018 15:44	M
Analysis Desc: Residue-Total,SM2540G,Soil	Analytical Method: SM 2540G							
Total Solids	**78000**		**mg/Kg**	**1**			5/19/2018 12:06	M^
WET CHEMISTRY								
Analysis Desc: Percent Solids,SM2540G,Soil	Analytical Method: SM 2540G							
Percent Moisture	**92**		**%**	**1**			5/17/2018 15:16	M

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ANALYTICAL RESULTS QUALIFIERS

Workorder: M1801972 SFEC Nutrient Center

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.
[1]	Surrogate diluted out.
J4	Estimated Result

LAB QUALIFIERS

J	DOH Certification #E82574(AEL-JAX)(FL NELAC Certification)
M	DOH Certification #E82535(AEL-M)(FL NELAC Certification)
M^	Not Certified

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QUALITY CONTROL DATA

Workorder: M1801972 SFEC Nutrient Center

QC Batch: DGMj/1551 Analysis Method: SW-846 7471A
QC Batch Method: SW-846 7471A Prepared: 05/18/2018 11:10
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

METHOD BLANK: 2716986

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Mercury	mg/Kg	0.00070	0.00070	U

QC Batch: EXTm/1472 Analysis Method: SW-846 8270C (SIM)
QC Batch Method: SW-846 3550B Prepared: 05/22/2018 08:30
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005

METHOD BLANK: 2719363

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
SEMIVOLATILES				
Phenanthrene	mg/Kg	0.0021	0.0021	U
Fluoranthene	mg/Kg	0.0020	0.0020	U
Nitrobenzene-d5 (S)	%	115	33-134	
2-Fluorobiphenyl (S)	%	78	37-127	
p-Terphenyl-d14 (S)	%	94	42-141	

QC Batch: EXTm/1476 Analysis Method: SW-846 8270C (SIM)
QC Batch Method: SW-846 3550B Prepared: 05/22/2018 12:30
Associated Lab Samples: M1801972006, M1801972007, M1801972008

METHOD BLANK: 2720114

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
SEMIVOLATILES				
Phenanthrene	mg/Kg	0.0021	0.0021	U
Fluoranthene	mg/Kg	0.0021	0.0021	U
Nitrobenzene-d5 (S)	%	127	33-134	
2-Fluorobiphenyl (S)	%	87	37-127	
p-Terphenyl-d14 (S)	%	103	42-141	

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QUALITY CONTROL DATA

Workorder: M1801972 SFEC Nutrient Center

QC Batch: WCAm/2473 Analysis Method: EPA 351.2
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/25/2018 09:15
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

METHOD BLANK: 2721951

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	30	30	U

METHOD BLANK: 2721952

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	8.9	8.9	U

QC Batch: WCAm/2473 Analysis Method: EPA 365.4
QC Batch Method: Copper Sulfate Digestion Solid Prepared: 05/25/2018 09:15
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

METHOD BLANK: 2721951

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Kjeldahl Nitrogen	mg/Kg	30	30	U

METHOD BLANK: 2721952

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Total Phosphorus (as P)	mg/Kg	8.9	8.9	U

QC Batch: DGMm/1329 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3050B Prepared: 05/24/2018 11:05
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

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QUALITY CONTROL DATA

Workorder: M1801972 SFEC Nutrient Center

METHOD BLANK: 2723930

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Arsenic	mg/Kg	0.10	0.10	U
Beryllium	mg/Kg	0.0058	0.0058	U
Cadmium	mg/Kg	0.0082	0.0082	U
Chromium	mg/Kg	0.18	0.18	U
Nickel	mg/Kg	0.12	0.12	U
Lead	mg/Kg	0.051	0.051	U
Antimony	mg/Kg	0.088	0.088	U
Zinc	mg/Kg	0.39	0.39	U

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
METALS				
Copper	mg/Kg	0.15	0.15	U

QC Batch: DGMm/1330 Analysis Method: SW-846 6010
QC Batch Method: SW-846 3010A Prepared: 05/25/2018 11:00
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

METHOD BLANK: 2724267

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Aluminum	mg/L	0.080	0.080	U
Lead	mg/L	0.0011	0.0011	U
Zinc	mg/L	0.0050	0.0050	U

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Copper	mg/L	0.0025	0.0025	U

QC Batch: WCAm/2525 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Prepared:
Associated Lab Samples: M1801972001, M1801972002, M1801972003, M1801972004, M1801972005, M1801972006, M1801972007,

METHOD BLANK: 2726250

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
WET CHEMISTRY				
Nitrate + Nitrite	mg/Kg	1.0	1.0	U

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QUALITY CONTROL DATA

Workorder: M1801972 SFEC Nutrient Center

METHOD BLANK: 2726250

QUALITY CONTROL DATA QUALIFIERS

Workorder: M1801972 SFEC Nutrient Center

QUALITY CONTROL 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

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Fax: (954)889-2281

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801972 SFEC Nutrient Center

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801972001	805 Nu Fine roots w/loose muck			SM 2540G	WCAm/2387
M1801972002	820 Co Fine roots w/loose muck			SM 2540G	WCAm/2387
M1801972003	822 P-C muck with fine roots			SM 2540G	WCAm/2387
M1801972004	824-825 fine roots w/loose muc			SM 2540G	WCAm/2387
M1801972005	827-830			SM 2540G	WCAm/2387
M1801972006	833 W-1			SM 2540G	WCAm/2387
M1801972007	817-818 fine roots w/loose muc			SM 2540G	WCAm/2387
M1801972008	837-840 fine roots with muck			SM 2540G	WCAm/2387
M1801972001	805 Nu Fine roots w/loose muck	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972002	820 Co Fine roots w/loose muck	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972003	822 P-C muck with fine roots	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972004	824-825 fine roots w/loose muc	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972005	827-830	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972006	833 W-1	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972007	817-818 fine roots w/loose muc	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972008	837-840 fine roots with muck	SW-846 7471A	DGMj/1551	SW-846 7471A	CVAj/1136
M1801972001	805 Nu Fine roots w/loose muck			SM 2540G	WCAm/2426
M1801972002	820 Co Fine roots w/loose muck			SM 2540G	WCAm/2426
M1801972003	822 P-C muck with fine roots			SM 2540G	WCAm/2426
M1801972004	824-825 fine roots w/loose muc			SM 2540G	WCAm/2426
M1801972005	827-830			SM 2540G	WCAm/2426
M1801972006	833 W-1			SM 2540G	WCAm/2426
M1801972007	817-818 fine roots w/loose muc			SM 2540G	WCAm/2426
M1801972008	837-840 fine roots with muck			SM 2540G	WCAm/2426
M1801972001	805 Nu Fine roots w/loose muck	SW-846 3550B	EXTm/1472	SW-846 8270C (SIM)	MSSm/1199

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: M1801972 SFEC Nutrient Center

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801972002	820 Co Fine roots w/loose muck	SW-846 3550B	EXTm/1472	SW-846 8270C (SIM)	MSSm/1199
M1801972003	822 P-C muck with fine roots	SW-846 3550B	EXTm/1472	SW-846 8270C (SIM)	MSSm/1199
M1801972004	824-825 fine roots w/loose muc	SW-846 3550B	EXTm/1472	SW-846 8270C (SIM)	MSSm/1199
M1801972005	827-830	SW-846 3550B	EXTm/1472	SW-846 8270C (SIM)	MSSm/1199
M1801972006	833 W-1	SW-846 3550B	EXTm/1476	SW-846 8270C (SIM)	MSSm/1200
M1801972007	817-818 fine roots w/loose muc	SW-846 3550B	EXTm/1476	SW-846 8270C (SIM)	MSSm/1200
M1801972008	837-840 fine roots with muck	SW-846 3550B	EXTm/1476	SW-846 8270C (SIM)	MSSm/1200
M1801972001	805 Nu Fine roots w/loose muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972002	820 Co Fine roots w/loose muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972003	822 P-C muck with fine roots	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972004	824-825 fine roots w/loose muc	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972005	827-830	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972006	833 W-1	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972007	817-818 fine roots w/loose muc	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972008	837-840 fine roots with muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 365.4	WCAm/2503
M1801972001	805 Nu Fine roots w/loose muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972002	820 Co Fine roots w/loose muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972003	822 P-C muck with fine roots	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972004	824-825 fine roots w/loose muc	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972005	827-830	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972006	833 W-1	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972007	817-818 fine roots w/loose muc	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972008	837-840 fine roots with muck	Copper Sulfate Digestion Solid	WCAm/2473	EPA 351.2	WCAm/2504
M1801972001	805 Nu Fine roots w/loose muck	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341

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Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801972002	820 Co Fine roots w/loose muck	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972003	822 P-C muck with fine roots	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972004	824-825 fine roots w/loose muc	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972005	827-830	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972006	833 W-1	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972007	817-818 fine roots w/loose muc	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972008	837-840 fine roots with muck	SW-846 3050B	DGMm/1329	SW-846 6010	ICPm/1341
M1801972001	805 Nu Fine roots w/loose muck	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972002	820 Co Fine roots w/loose muck	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972003	822 P-C muck with fine roots	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972004	824-825 fine roots w/loose muc	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972005	827-830	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972006	833 W-1	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972007	817-818 fine roots w/loose muc	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972008	837-840 fine roots with muck	SW-846 3010A	DGMm/1330	SW-846 6010	ICPm/1342
M1801972001	805 Nu Fine roots w/loose muck			EPA 9056	WCAm/2525
M1801972002	820 Co Fine roots w/loose muck			EPA 9056	WCAm/2525
M1801972003	822 P-C muck with fine roots			EPA 9056	WCAm/2525
M1801972004	824-825 fine roots w/loose muc			EPA 9056	WCAm/2525
M1801972005	827-830			EPA 9056	WCAm/2525
M1801972006	833 W-1			EPA 9056	WCAm/2525
M1801972007	817-818 fine roots w/loose muc			EPA 9056	WCAm/2525
M1801972008	837-840 fine roots with muck			EPA 9056	WCAm/2525
M1801972001	805 Nu Fine roots w/loose muck	Calculation	CLCm/	Calculation	CLCm/
M1801972002	820 Co Fine roots w/loose muck	Calculation	CLCm/	Calculation	CLCm/

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Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
M1801972003	822 P-C muck with fine roots	Calculation	CLCm/	Calculation	CLCm/
M1801972004	824-825 fine roots w/loose muc	Calculation	CLCm/	Calculation	CLCm/
M1801972005	827-830	Calculation	CLCm/	Calculation	CLCm/
M1801972006	833 W-1	Calculation	CLCm/	Calculation	CLCm/
M1801972007	817-818 fine roots w/loose muc	Calculation	CLCm/	Calculation	CLCm/
M1801972008	837-840 fine roots with muck	Calculation	CLCm/	Calculation	CLCm/

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3: 4955 SW 41st Blvd. • Gainesville, FL 32608 • 352.377.2349 • Fax 352.395.6639
0200 USA Today Way, Miramar, FL 33025 • 954.889.2289 • Fax 954.889.2281
10 Princess Palm Ave. • Tampa, FL 33619 • 813.630.9616 • Fax 813.630.4327

M1801972

Client Name: Andrew Gottlieb
Address: 30 S M Street, Lake Worth, FL 33460
Phone: 561-635-4374
FAX:
Contact:
Sampled By: A Gottlieb
Turn Around Time: ☒ STANDARD ☐ RUSH
AEL Profile #:

Project Name: SFEC Nutrient Conta
Project Number:
PO Number:
FDEP Facility No:
FDEP Facility Address:
Special Instructions: See attached note for sample 827-830.
☐ ADaPT ☐ EQuIS ☐ Other

BOTTLE SIZE & TY
ANALYSIS REQUIRED
Preservation
Field-Filtered?
LABORATORY I.D. NUMBER

SAMPLE ID	SAMPLE DESCRIPTION	Grab Comp	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. COUNT
805 NW	Fine roots w/loose muck	G	5-8-18		Plant/soil	
820 Cat	Fine roots w/ muck	G	5-8-18		Plant/soil	
822 P-C	Muck w/ fine roots	G	5-8-18		Plant/soil	
824-825	Fine roots w/ loose muck	C	5-8-18		Plant/soil	
827-830	Cattail roots + leaves detritus	C	5-18-18		Plant/soil	
833 W/	Muky peat w/ fine roots	G	5-8-18		Plant/soil	
817-818	Fine roots w/loose muck	C	5-8-18		Plant/soil	
837-840	Fine roots w/ muck	C	5-8-18		Plant/soil	

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)_____ °C

DCN: AD-051 Form last revised 06/19/2017

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]	5-15-18	1310	[signature]	5-15-18	1310
2						
3						
4						

FOR DRINKING WATER USE:
(When PWS Information not otherwise supplied) PWS ID:_____
Contact Person:_____ Phone:_____
Supplier of Water:_____
Site-Address:_____

May 15, 2018

Please note that we did not have enough bottles with pre-marked labels for the contaminant suite. We used a nutrient bottle for sample #827-830. This sample should be analyzed for the same suite of contaminants that the other seven samples will be analyzed for. Please feel free to contact me with any questions. Thank you.

Regards,

Andy

Andrew Gottlieb, Ph.D.

SFEC

(561) 635-4374

Appendix E
FWC Evaluation of Potential Upland Disposal Sites

Appendix E

FWC Evaluation of Potential Upland Disposal Sites

Drawdown and Habitat Enhancement of East Lake Tohopekaliga

January 2019

Analysis of Potential Upland Disposal Sites for East Lake Tohopekaliga Project

An evaluation of alternatives is required under both National Environmental Policy Act (NEPA) and the Section 404(b)(l) Guidelines. NEPA requires consideration of a reasonable range of alternatives, including the No-Action Alternative. Section 404 Guidelines states that practicability of alternatives be taken into consideration and that no alternative may be permitted if there is a less environmentally damaging practicable alternative. To achieve the practicable objective, an alternative must be available, achieve the project purpose (as defined by U.S. Army Corps of Engineers), and be feasible when considering cost, logistics and technology.

The Florida Fish and Wildlife Conservation Commission (FWC) evaluated ten parcels of land identified for potential upland disposal sites (Figure 1) in response to the NEPA guidance. The sites were selected to receive organic sediments that would be removed from the littoral zone of East Lake Toho. Each parcel was required to be greater than 121 acres in size to accommodate the anticipated 100,000 cubic yards of organic sediments to be disposed. Also the parcel was required to be within a 3-mile radius of the Chisholm Park boat ramp located within Chisolm Park (i.e., lake access site for the Project) to be economically feasible. The hauling distance range included hauling from the southernmost end of the scrape site immediately adjacent to the ramp (no additional miles) to the northernmost end of the scrape site (additional 2.7 miles). FWC evaluated the ten land parcels and each was eliminated for the reasons stated below.

Parcel #18: Hauling (on lake bottom and on-road) distance is 4.53 to 7.23 miles. Approximately 75 percent of the property is currently under development (residential housing) or is wetlands or forest. There may also be issues getting to the non-developed area of the parcel (would have to go through the area in which houses are being constructed and a retention pond may be blocking access).

Parcel #58: Hauling distance is 2.2 to 4.9 miles. Parcel is currently part of a working cattle ranch and has wetlands within the parcel. The last 0.95 mile to the disposal site is dirt roads that will require upkeep/maintenance by the contractor. Landowner (Center Lake Properties) will not take any material.

Parcel #59: Hauling distance is 2.7 to 5.4 miles. Approximately two-thirds of the property is forested and the remaining third has some wetlands. The same 0.95 mile of dirt road will require upkeep/maintenance as in #58. Travel through parcel #58 is necessary to gain access to this parcel. Landowner (Center Lake Properties) will not take any material.

Parcel #63: 90 percent of the parcel is forested or wetlands.

Parcel #55: Hauling distance is 2.63 to 5.33 miles. Requires hauling over another private-property owner's pasture for 0.51 mile and part of the hauling distance (0.87 miles) is dirt roads that will require contractor upkeep/maintenance. Approximates 75 percent of the parcel is forest or wetlands. Landowner (Center Lake Properties) will not take any material.

Parcels #77 & #79: Need to be combined to get non-forested acreage. Hauling distance is 3.58 to 6.28 miles. Requires travel through private pasture (0.51 mile) and through parcel

#55 to gain access. Landowner (Center Lake Properties) will not take any material.

Parcel #56: Approximately 90 percent forest or ditched wetlands.

Parcel #24: Approximately 90% forest or wetlands.

Parcel #0: Hauling distance is 4.23 to 6.93 miles, if the property directly is directly accessed off Highway 192 (slight ditch). If the property cannot be accessed from Highway 192, an additional 0.82 miles hauling (5.05 to 7.75 miles total) must be added to the hauling distance. Landowner (Live Oak Ranch) would not respond to requests (requests were sent via certified letter) and has not been willing to accept any material associated with past projects.

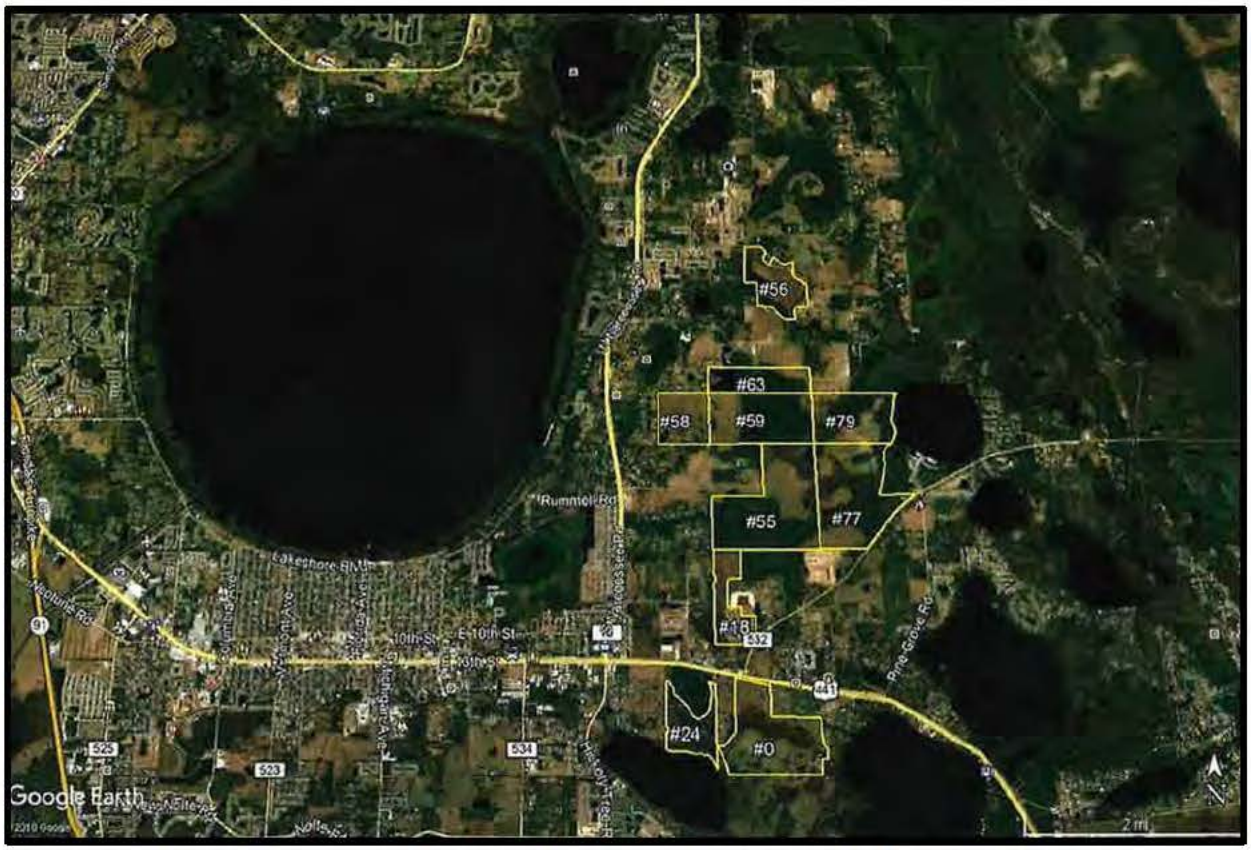


Figure 1-Land Parcels Identified by FWC for Possible Upland Disposal Sites of Organic Sediments Removed from East Lake Toho

Appendix F
Best Management Practices
for
East Lake Tohopekaliga Project

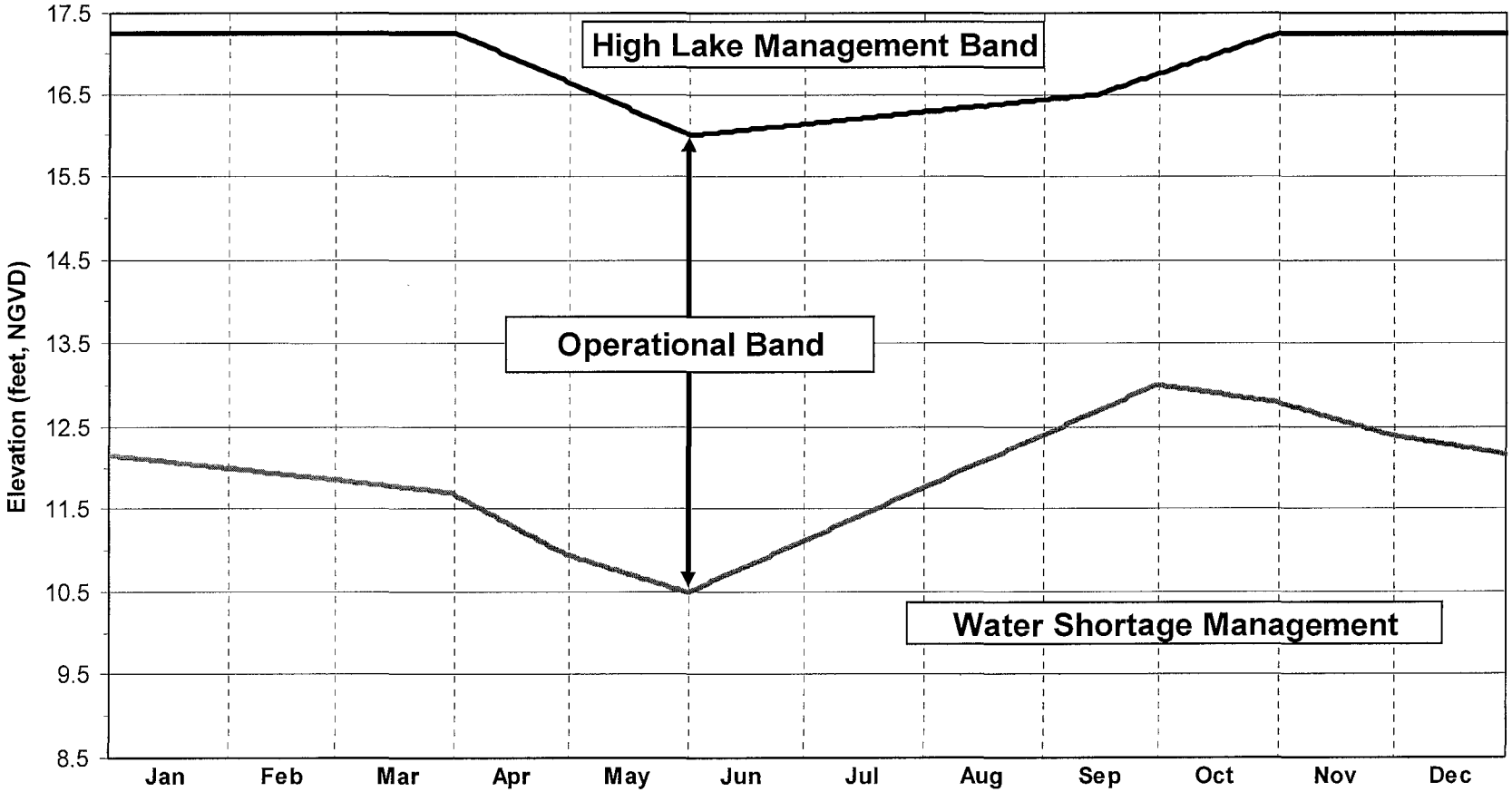
East Lake Toho Project Phase	Best Management Practices to be Implemented
Staging area	• Equipment would not be mobilized under adverse weather conditions (e.g., high wind or rain) • Silt fence would be installed adjacent to equipment staging area • Snail Kite, Indigo Snake, and Caracara precautions would be followed (details noted under threatened and endangered specific BMPs below
Lake level drawdown	• Draw down would be rescheduled under extreme wet or dry conditions (e.g., upper and/or lower quartile of rainfall and stage distribution) • Project would be postponed if snail kites are nesting at the onset of the proposed project (October and November 2019)
Pump usage to facilitate lake drawdown	• Fuel spill plan would be established prior to implementation • Intake structure will be designed to minimize mobilization and transport of sediment to downstream receiving body, Lake Tohopekaliga • Turbidity monitoring would occur at discharge location within Lake Tohopekaliga downstream of the established mixing zone
Scrapping of eastern shore littoral zone	• All work would be coordinated under supervision of the FWC project manager • Trained FWC representative would be onsite to monitor project progress and to affirm BMPs are being utilized • All work would cease if federally threatened or endangered species (e.g., snail kite, indigo snake, crested caracara, or other) are present on work site; threatened and endangered species would not be disturbed and work would only commence once species leave of their own volition • No work will be conducted in standing water • No work would be conducted outside of the designated scrape area; scrape area would be clearly delineated on both the lakeward and shore sides of the polygon (either digitally or in field) • No work would be conducted under high wind conditions to minimize entrainment of soil/sediment and possible water quality impacts • Silt fence would be installed on the lakeward boundary of the proposed scrape polygon • Material scraped would be limited to organic sediments; scraping would not affect mineral soils • Scrape would not be deeper than 36" of organic material or until the mineral layer is reached, whichever is less. • Invasive exotic vegetation (ie *Panicum repens* and *Scleria lacustris*) within and adjacent to scrape polygon would be identified and treated with herbicide to promote growth of desirable native vegetation (prior to lake refill and during the subsequent growing season)

Burning of woody vegetation gathered from eastern shore scraping	• Public notice would be provided prior to burning and would include planned burn schedule and contact information for the FWC project manager • Burning would not be initiated under adverse wind conditions: winds blowing from the northwest, west, or southwest, or under high wind conditions • Burning would be coordinated with the Florida Department of Forestry • Smoke, ash, and health concerns from burning of woody vegetation would be monitored by FWC with the support of the State of Florida Forestry Department and Osceola County
Cattail Spray and Burn (N&W)	• Public notice will be provided prior to spraying and burning and will include planned schedule and contact information of FWC project manager. • Spray and burn will not occur under high wind conditions or if winds are blowing from the E or S (when working in the W and N spray areas, respectively) • Invasive exotic vegetation (ie *Panicum repens* and *Scleria lacustris*) within and adjacent to scrape polygon would be identified and treated with herbicide to promote growth of desirable native vegetation (prior to lake refill and during the subsequent growing season)
Spoil island construction and maintenance	• Install floating turbidity curtain to limit water quality impacts prior to island construction. Curtain should be long enough to accommodate the change in water level with lake refill • Installation of silt fence prior to construction adjacent to island in areas that are not inundated (primarily for S island but also as relevant for proposed N spoil island) • Maximize littoral shelf of spoil islands during construction • Cover island with vegetation-permeable geofabric to stabilize soils • Seed with native, non-invasive grass or sedge seed to further stabilize sediments • Re-seed with native grass or sedge seeds to stabilize sediments, if necessary • Cypress trees would be planted along the front edge of spoil islands to improve stability, as well as provide improved aesthetic conditions
Lake refill operations	• Snail Kite nesting and general threatened and endangered species surveys would be conducted prior to refill within the lake littoral zone • If snail kite nests are present or other threatened or endangered species are present, USFWS would be contacted for guidance/coordination prior to initiating lake refill • Turbidity curtains would be installed prior to ascension adjacent to all work areas on the eastern shore • Areas of the lake where invasive exotic vegetation has expanded significantly, relative to the before project conditions, will be treated
Water quality monitoring plan	• At a minimum three paired (control, impact) transects would be established within the eastern work area to evaluate potential impacts

	to water quality (Nutrients - TP, SRP, TN, TKN, turbidity and dissolved oxygen); two of those pairs would be located near the proposed spoil islands locations • Pre project, construction monitoring, and post project monitoring would be conducted; at a minimum 4 to 5 sample stations would be established for each transect • Two additional transects would be established within the proposed spray areas, one on the north side of the lake and one on the west side; these would be individual transects rather than the paired transects associated with the scrape component • Turbidity monitoring would be conducted as required by permits • Detailed monitoring design would be developed contingent upon USACE approval; draft monitoring plan would be reviewed by USEPA prior to implementation • Baseline monitoring would be implemented as soon as possible to collect replicate samples prior to project implementation • Goals of the water quality plan are two-fold, (1) monitor any nutrient loading to the lake by the spoil islands over time and (2) document water quality project benefits in and around the scrape zone • Dissolved oxygen sampling would need to begin well prior to project initiation and would ideally be measured continuously to statistically distinguish project effects from diurnal cycling and diffusion
Cultural resources/tribal interests	• A FWC staff member with archaeological resource management training would be onsite to monitor project progress • Project manager would be notified upon discovery of archaeological resources and work would cease until guidance is provided; FWC would consult with the Florida SHPO
Threatened and endangered species	• All work would cease if federally threatened or endangered species (e.g., snail kite, indigo snake, crested caracara, or other) are present on work site; threatened and endangered species would not be disturbed and work would only commence once species leave of their own volition • Project would be postponed if snail kites are nesting at the onset of the proposed project (October and November 2019) • The timing of the Project (work window) is such that water level manipulation would occur prior to the peak snail kite nesting period (February to June) • As recommended by USFWS, water would be lowered beyond the extent of (most) herbaceous vegetation prior to February 1 • Project would not be implemented if extreme wet or extreme dry conditions exist throughout the Kissimmee Chain of Lakes and into critical snail kite nesting areas to the south. • T&E surveys would be conducted prior to lake ascension

	• Water level ascension in June would be conducted sufficiently slowly (less than 1 foot per month) to promote vegetation stability and survival of snail kites • Create and distribute educational materials regarding eastern indigo snake identification, biology and habitat requirements to all relevant staff and all contractors • FWC project manager will confirm that all contractors have had appropriate T&E species training prior to performing work. • All efforts to keep herbicide toxic to wildlife from entering wetlands and waterways shall be taken particularly in areas adjacent to recent caracara observations. • To protect water quality (prevent violations of state water quality standards) and habitat resources and to avoid secondary environmental damage to adjacent wetlands, best management practices (BMPs) (as noted above) would be employed throughout the Project (Permit No: SAJ-2015-00644 [SP-SLR], drawing 47/52) (USACE 2016)

Appendix G
Lake Okeechobee Regulation Schedule Information



NOTES:

High Lake Management Band: Outlet canals may be maintained above their optimum water management elevations.
Operational Band: Outlet canals should be maintained within their optimum water management elevations.
Water Shortage Management Band: Outlet canals may be maintained below optimum water management elevations.

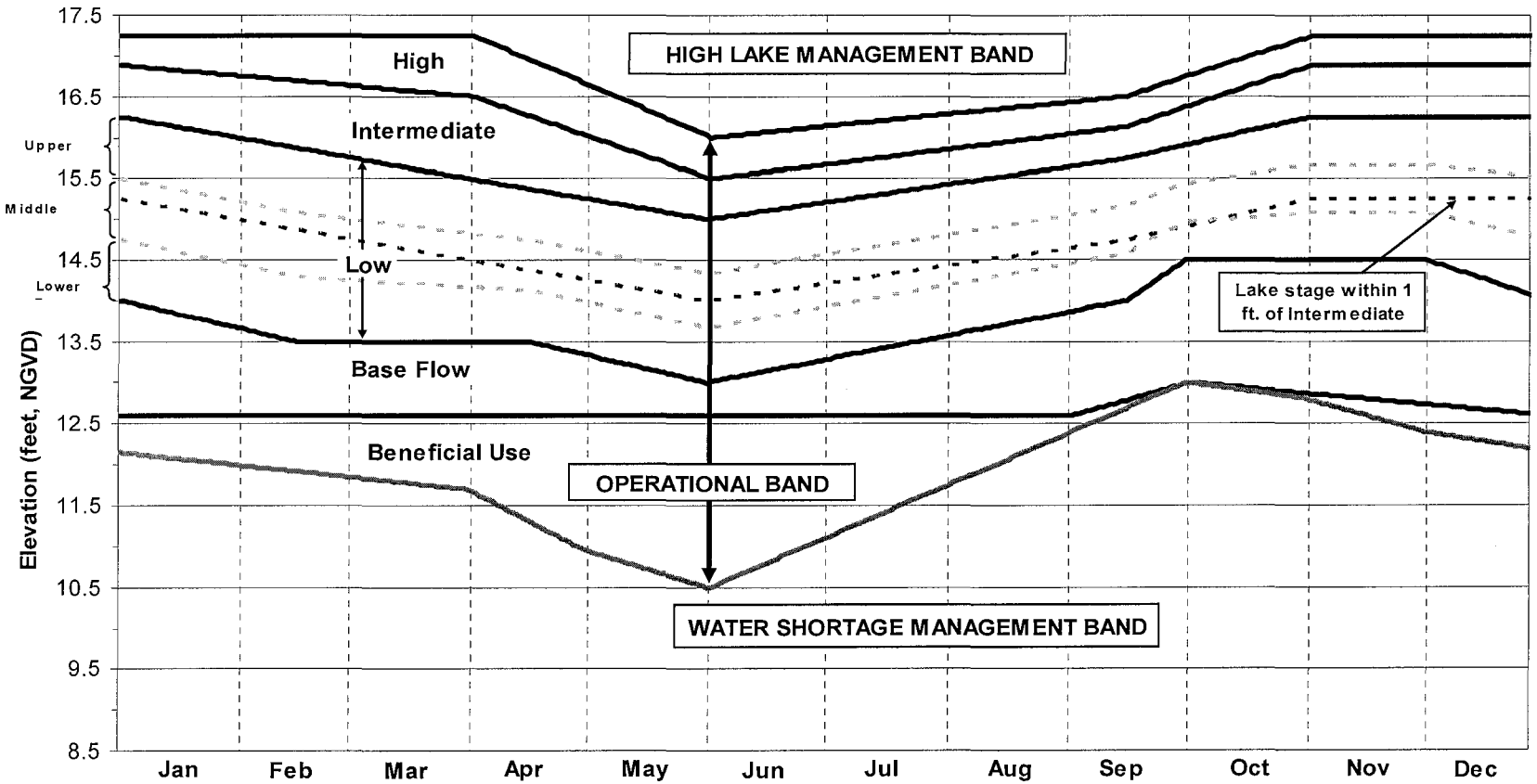
CENTRAL AND SOUTHERN FLORIDA PROJECT

2008 LAKE OKEECHOBEE
INTERIM REGULATION SCHEDULE

PART A

DATED: March 2008
DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA

FIGURE 1



NOTES:

High Lake Management Band: Outlet canals may be maintained above their optimum water management elevations.
Operational Band: Outlet canals should be maintained within their optimum water management elevations.
Water Shortage Management Band: Outlet canals may be maintained below optimum water management elevations.

CENTRAL AND SOUTHERN FLORIDA PROJECT

2008 LAKE OKEECHOBEE
INTERIM REGULATION SCHEDULE
PART B

DATED: March 2008
DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA

FIGURE 2

2008 LORS

Part C: Establish Allowable Lake Okeechobee Releases to the Water Conservation Areas

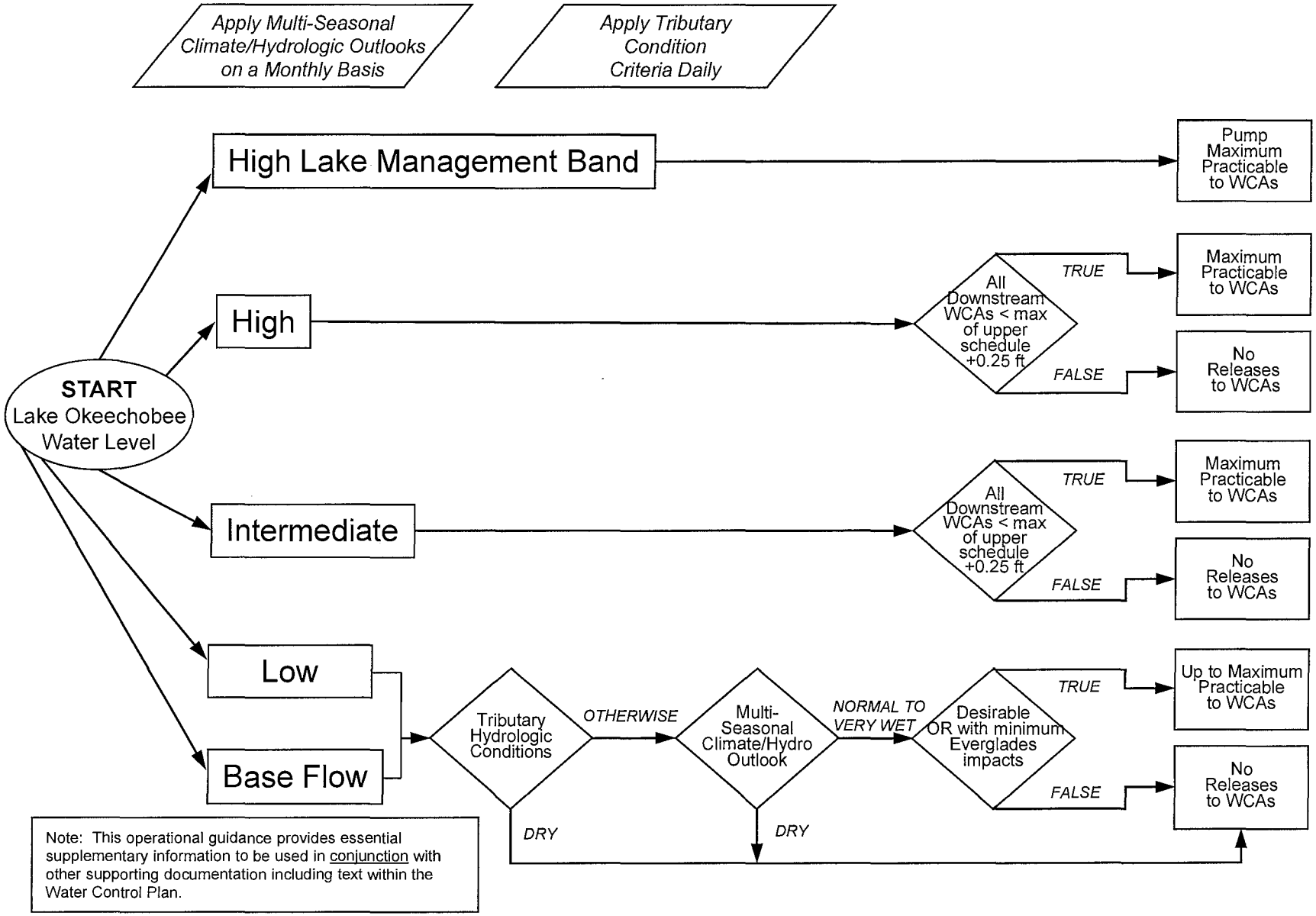
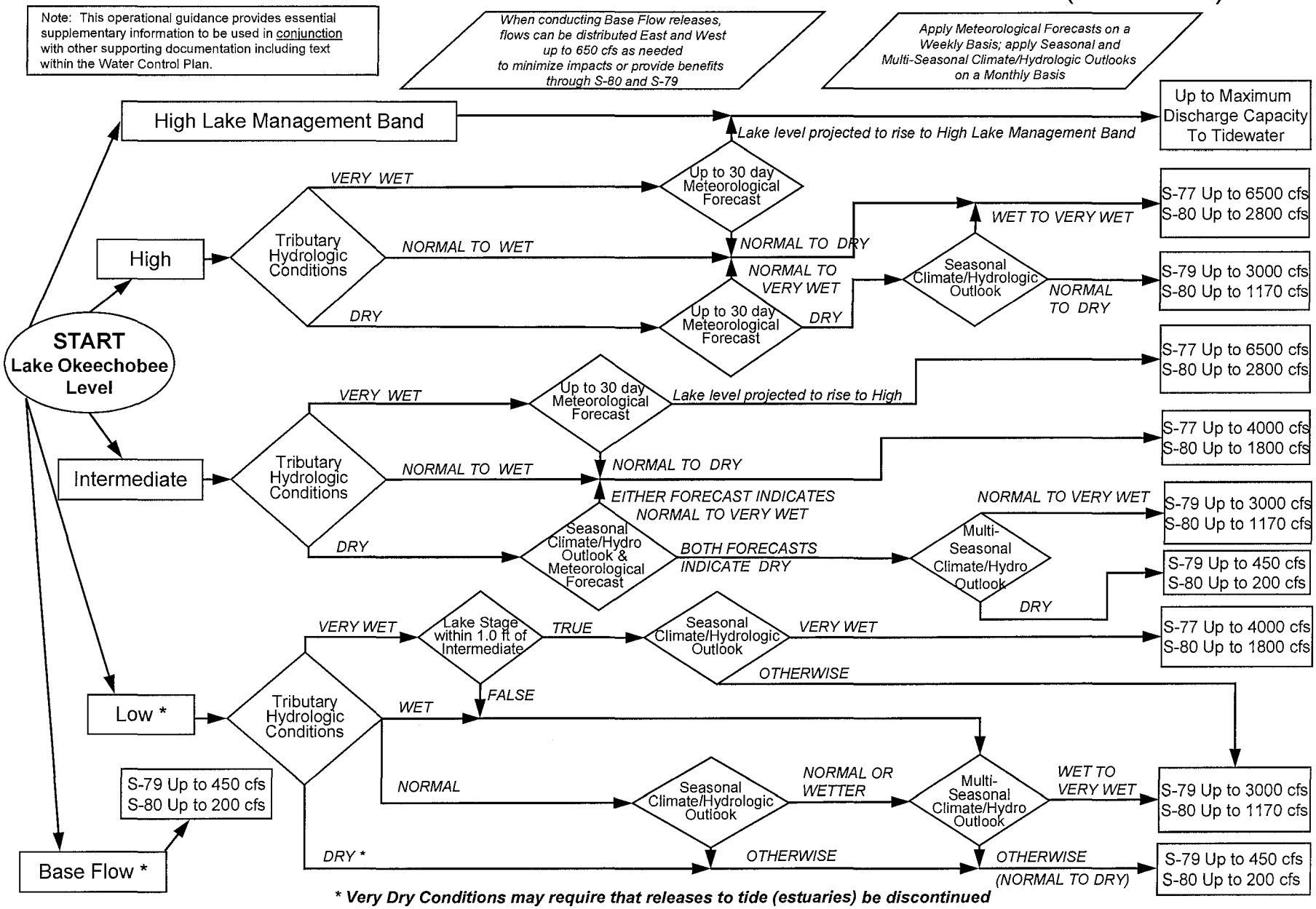


FIGURE 3

2008 LORS

Part D: Establish Allowable Lake Okeechobee Releases to Tide (Estuaries)



*** Very Dry Conditions may require that releases to tide (estuaries) be discontinued**

FIGURE 4