



TIERRA CONSULTING GROUP, INC.
ENVIRONMENTAL ENGINEERING & CONSULTING
5815 N. ANDREWS WAY, SUITE B, FT. LAUDERDALE, FL 33309
TELEPHONE (954) 202-9226 FAX (954) 202-9227

LICENSED ENGINEERING, ASBESTOS & GEOLOGICAL BUSINESS

Ms. Linda A. Brien, P.G.
Underground Injection Control – Southeast District
Florida Department of Environmental Protection
3301 Gun Club Road
MSC 7210-1
West Palm Beach, FL 33406

October 19, 2015

Subject: Reasonable Assurance Report
Gerry Curtis Park, 1901 NW 24th Avenue, Miami, Florida 33125
Class V, Group 6, Stormwater Drainage Well
FDEP Permit File No. _____
TCG Project No. 16053

Dear Ms. Brien:

At the request of Jaffer Well Drilling, Tierra Consulting Group, Inc. (TCG) is pleased to provide this report of reasonable assurance for the above-referenced property. The project site is addressed as 1901 NW 24th Avenue, Miami, Florida 33125. Four stormwater drainage wells are proposed for installation by Jaffer Well Drilling as specified on SCS Engineers *Paving Grading and Drainage Plan* sheet C-7.2.

Site Location & Description

The project site is comprised of two parcels bisected by NW North River Drive, bordered to the north by NW 20th Street, to the east by a combination of multi-family residential and commercial/municipal parcels, to the south by the Miami River, and to the west by NW 24th Avenue. The approximate GPS coordinates of the center of the site are 25°47'32.59" N and 80°14'03.85" W. The nearest surface waters are the brackish waters of the Miami River located directly south of the project site. Ground surface elevation is approximately +5 feet relative to the National Geodetic Vertical Datum (NGVD).

A site topographic map (**Figure 1**), aerial photograph depicting the site location (**Figure 2**), and a photocopy of the Miami-Dade County Property Appraiser Summary Report are presented in **Appendix I**.

UIC Class V Non-ASR Well Review

| <u>Facility ID</u> | <u>Facility Name</u> | <u>Type of Well</u> | <u>Well No.</u> | <u>UIC Status</u> |
|--------------------|-----------------------------|--------------------------|-----------------|-------------------|
| 64150 | Marine Park Construction | Stormwater Drainage Well | 1 | Active |
| 56493 | Local Drainage Project E-68 | Stormwater Drainage Well | S-19 | Active |
| 56493 | Local Drainage Project E-68 | Stormwater Drainage Well | S-21 | Active |

The existing FDEP permitted Marine Park Construction Well 1 at Gerry Curtis Park is currently active. Local Drainage Project E-68 (FDEP Permit No UC 13-202880) Well S-19 and S-21 are currently active. All three wells are expected to remain active.

Geologic Data

Site-specific geologic data was collected during core drilling activities performed by Geo-X Geotechnical and Environmental Exploration, Inc. on October 1, 2015 (**Appendix II**). A borehole was drilled from the ground surface to a depth of 120 feet below land surface (bls). The subsurface strata were observed to consist of sand and limestone materials consistent with the Pamlico Sand, Miami Limestone, Anastasia, Key Largo Limestone, and Tamiami Formations. Visual examination of subsurface core materials encountered at the following approximate depth intervals bls are detailed below:

0' to 2': Compacted fill with organics and sand. N value = 34

2' to 13.5': Fine grain calcareous sand with limestone fragments. N value range = 3 to 12

13.5' to 28.5': Light brown limestone with fine grain sand. N value range = 6 to 12

28.5' to 43.5': Light gray limestone with fine sand. N value range = 10 to 28

43.5' to 58.5': Light brown fossiliferous limestone with fine sand. N-value range = 17 to >50

58.5' to 83.5': Very hard brown sandy limestone with fine sand. N-values = >50

83.5' to 98.5': Light gray sandy limestone with fine sand. N-value range = 18 to >50

98.5' to 120': Competent, dense limestone with lenses of fine sand. N-value range = 30 to >50

Based upon site lithology observed beneath the project site, competent layers of sandy limestone strata that exhibit high N-values (>50 blows per foot) are present at depths below 58.5 feet bls (equivalent to -53.5 feet NGVD) and include lenses of competent fine sand to the total borehole depth of 120 feet bls, equivalent to -115 feet NGVD. These dense, semi-confining strata are expected to sufficiently abate vertical flow of buoyant stormwater discharged at depth.

Hydrogeologic Data

Site-specific hydrogeologic characterization for the Gerry Curtis Park project site was based on depth-specific groundwater samples collected at 65', 70', 75', and 80 feet bls (equivalent to -60', -65', -70' and -75' feet NGVD). Groundwater samples were submitted for laboratory analysis of Total Dissolved Solids (TDS) via EPA Method TDS SM 2540C at Florida Spectrum Environmental Services, Inc. Analytical results for these samples are reported in the following table, and photocopies of the laboratory analytical results and chain of custody documentation are included in **Appendix III**.

| Groundwater Sample Depth | | Total Dissolved Solids |
|--------------------------|-------------|------------------------|
| (feet bls) | (feet NGVD) | (mg/L) |
| 65 | -60 | 10300 |
| 70 | -65 | 17200 |
| 75 | -70 | 15700 |
| 80 | -75 | 18200 |

Notes

mg/L - milligrams per liter or parts per million (PPM)

Laboratory analytical results indicate that the G-II/G-III aquifer interface occurs at a depth shallower than 65 feet bls (equivalent to -60 feet NGVD) at the project site.

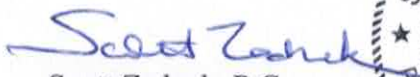
Conclusions & Recommendation

Geologic and hydrogeologic conditions at the Gerry Curtis Park project site demonstrate that the proposed use of Class V, Group 6, Stormwater Drainage Wells to be permitted by FDEP is an appropriate and prudent stormwater management option.

A recommended minimum casing setting depth of 85 feet bls (equivalent to -80 feet NGVD) will provide at least twenty feet of separation among the G-II/G-III aquifer interface and the proposed bottom of steel well casing. This recommended minimum casing setting depth allows for the well casing to penetrate into and beneath dense semi-confining layers of limestone strata that minimize the potential for vertical migration, mounding, or spring effects in conformance with the reasonable assurances necessary for permit approval. The overlying G-II aquifer and surface water bodies of the vicinity are therefore sufficiently buffered from buoyant stormwater discharged at depth.

In an effort to expedite the review and approval of the proposed stormwater drainage well permit, please feel free to contact me directly for any clarifications at (954) 202-9226.

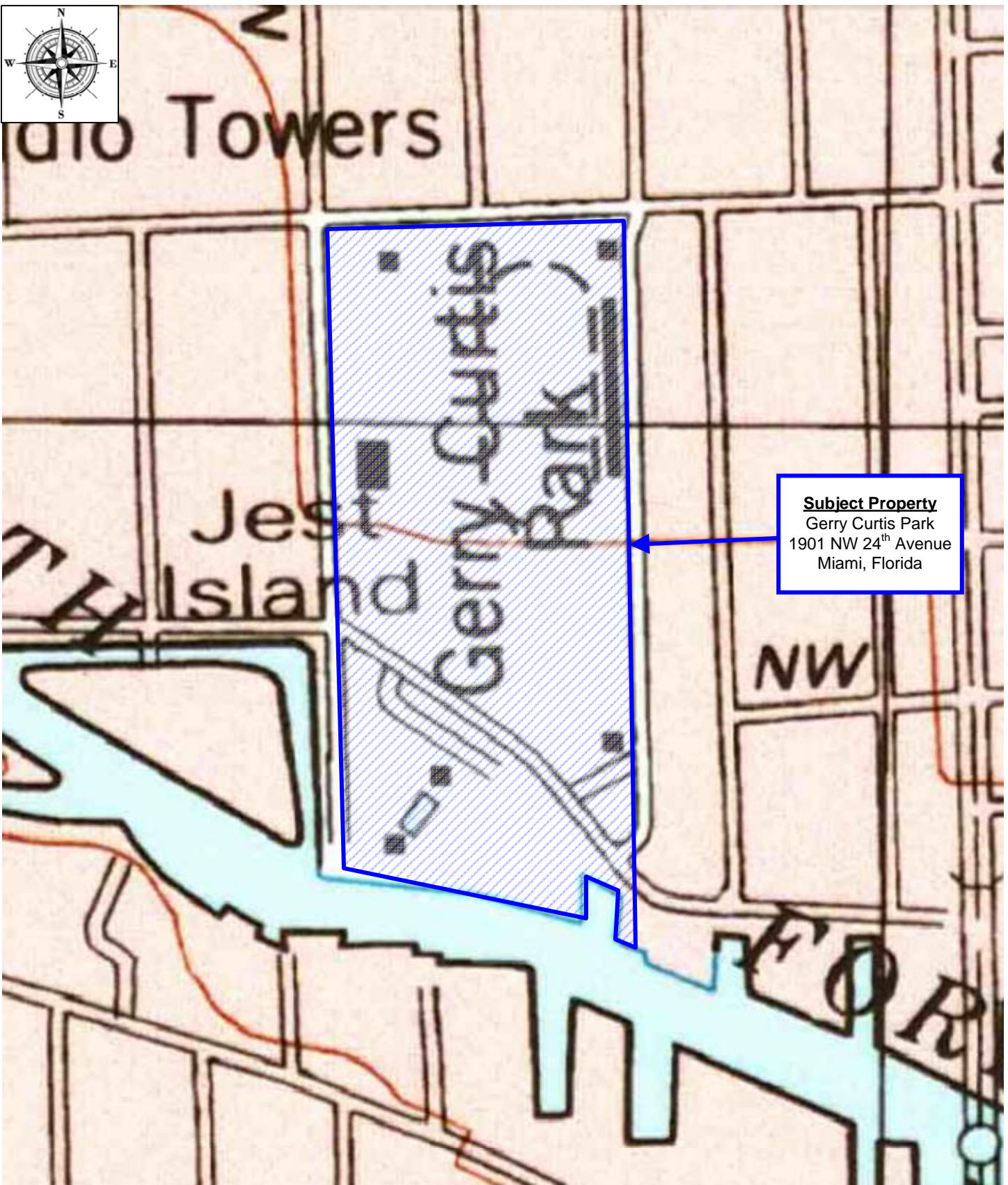
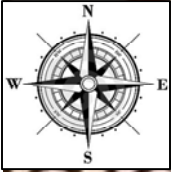
Sincerely:


Scott Zednek, P.G.
Florida License No. 0002086



APPENDIX I

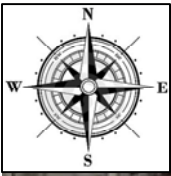
SITE FIGURES AND PROPERTY APPRAISER DATA



Subject Property
Gerry Curtis Park
1901 NW 24th Avenue
Miami, Florida

| | | |
|---|--------------------------|------------------------------|
| Project Location: 1901 NW 24 th Avenue, Miami, Florida 33125 | | Client: Jaffer Well Drilling |
| Figure 1: USGS Topographic Map | Approx. Scale: 1" = 300' | Drawn by: JMM 10/12/15 |





Subject Property
Gerry Curtis Park
1901 NW 24th Avenue
Miami, Florida



Test Boring
Location

Proposed
Drainage Well
DW-2

Proposed
Drainage Well
DW-4

Proposed
Drainage Well
DW-3

Proposed
Drainage Well
DW-1

| | | |
|---|--------------------------|------------------------------|
| Project Location: 1901 NW 24 th Avenue, Miami, Florida 33125 | | Client: Jaffer well Drilling |
| Figure 2: Aerial Photograph | Approx. Scale: 1" = 250' | Drawn by: JMM 10/14/15 |





OFFICE OF THE PROPERTY APPRAISER

Summary Report

Generated On : 10/14/2015

| Property Information | |
|----------------------|--|
| Folio: | 01-3134-000-0330 |
| Property Address: | 1901 NW 24 AVE 1901 NW 24 AVE 1901 NW 24 AVE 1901 NW 24 AVE 1901 NW 24 AVE 1901 NW 24 AVE |
| Owner | CITY OF MIAMI-DEPT OF P&D ASSET MANAGEMENT DIVISION |
| Mailing Address | 444 SW 2 AVE STE #325 MIAMI , FL 33130-1910 |
| Primary Zone | 8002 PARKS & RECREATION |
| Primary Land Use | 8940 MUNICIPAL : MUNICIPAL |
| Beds / Baths / Half | 0 / 0 / 0 |
| Floors | 1 |
| Living Units | 0 |
| Actual Area | Sq.Ft |
| Living Area | Sq.Ft |
| Adjusted Area | 13,790 Sq.Ft |
| Lot Size | 1,081,595 Sq.Ft |
| Year Built | 1949 |



| Assessment Information | | | |
|------------------------|--------------|--------------|--------------|
| Year | 2015 | 2014 | 2013 |
| Land Value | \$10,815,950 | \$11,356,748 | \$11,356,748 |
| Building Value | \$449,292 | \$700,000 | \$700,000 |
| XF Value | \$267,193 | \$0 | \$0 |
| Market Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |
| Assessed Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |

| Benefits Information | | | | |
|----------------------|-----------|--------------|--------------|--------------|
| Benefit | Type | 2015 | 2014 | 2013 |
| Municipal | Exemption | \$11,532,435 | \$12,056,748 | \$12,056,748 |

Note: Not all benefits are applicable to all Taxable Values (i.e. County, School Board, City, Regional).

| Short Legal Description |
|--------------------------------|
| 34 53 41 24.83 AC |
| W1/2 OF E1/2 OF NW1/4 N OF RIV |
| LESS 50FT FOR RD LESS N20FT & |
| LESS W25FT OF N142FT FOR |
| STS & RIV R/W |

| Taxable Value Information | | | |
|---------------------------|--------------|--------------|--------------|
| | 2015 | 2014 | 2013 |
| County | | | |
| Exemption Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |
| Taxable Value | \$0 | \$0 | \$0 |
| School Board | | | |
| Exemption Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |
| Taxable Value | \$0 | \$0 | \$0 |
| City | | | |
| Exemption Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |
| Taxable Value | \$0 | \$0 | \$0 |
| Regional | | | |
| Exemption Value | \$11,532,435 | \$12,056,748 | \$12,056,748 |
| Taxable Value | \$0 | \$0 | \$0 |

| Sales Information | | | |
|-------------------|-------|--------------|---------------------------|
| Previous Sale | Price | OR Book-Page | Qualification Description |

The Office of the Property Appraiser is continually editing and updating the tax roll. This website may not reflect the most current information on record. The Property Appraiser and Miami-Dade County assumes no liability, see full disclaimer and User Agreement at <http://www.miamidade.gov/info/disclaimer.asp>

Version:

APPENDIX II
GEOLOGIC DATA

APPENDIX III
HYDROGEOLOGIC DATA



NELAP Certificate No. E86006



1460 West McNab Road
Fort Lauderdale, FL 33309
1-800-ANALYTE Phone
(954) 978-6400 Phone
(954) 978-2233 Fax

12 October 2015

Lab Work Order (COC): 15J0063

Jean M. Mazza
Tierra Consulting Group Inc.
5815 North Andrews Way, Suite B
Fort Lauderdale, FL 33309

RE: 16053 Gerry Curtis Park

Project Location: 1901 NW 24th Avenue, Miami, FL 33124

Dear Jean M. Mazza:

This report details the analytical results of samples collected at the above-referenced project location as well as the results of any associated quality control samples. These samples were received by Florida Spectrum Environmental Services at **10/02/2015 14:00**.

All Analyses were performed according to the TNI/NELAP standard unless indicated by a "~" on the report.

Your samples will be retained by Florida Spectrum Environmental for a period of at least 30 days following sample receipt or until the longest of the preparation and/or analytical hold times expires, whichever is shorter. After that time, they will be properly disposed without further notice, unless there exists an explicit contractual agreement to the contrary. We reserve the right to return any unused samples, extracts, or related materials or solutions to you if we consider it necessary. Examples might include those samples identified as hazardous wastes, submissions where the sample sizes significantly exceed those required for analysis, samples containing controlled substances, etc.

We thank you for selecting Florida Spectrum Environmental to serve your analytical needs. Should you have any questions or require additional information regarding any of the information in this report, please feel free to contact us at any time. We appreciate the opportunity to be of service.

Florida Spectrum Environmental Inc.



Report To:
Jean M. Mazza
Tierra Consulting Group Inc.
5815 North Andrews Way, Suite B
Fort Lauderdale FL, 33309

Page 2 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
1901 NW 24th Avenue, Miami, FL 33124

DETECTED ANALYTE SUMMARY

| <u>Client Sample ID</u> | <u>Laboratory ID</u> | <u>Matrix</u> | <u>Analyte</u> | <u>Result</u> | <u>Units</u> | <u>Collection Date</u> | <u>Collection Time</u> |
|-------------------------|----------------------|---------------|------------------------|---------------|--------------|------------------------|------------------------|
| 65 Feet | 15J0063-01 | Water | Total Dissolved Solids | 10300 | mg/L | 10/1/2015 | 11:15 |
| 70 Feet | 15J0063-02 | Water | Total Dissolved Solids | 17200 | mg/L | 10/1/2015 | 11:20 |
| 75 Feet | 15J0063-03 | Water | Total Dissolved Solids | 15700 | mg/L | 10/1/2015 | 11:30 |
| 80 Feet | 15J0063-04 | Water | Total Dissolved Solids | 18200 | mg/L | 10/1/2015 | 11:35 |

Florida-Spectrum Environmental Services, Inc.
1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
528 Gooch Rd.
Fort Mead, FL 33841

Big Lake Laboratory
610 Parrot Ave. N.
Okeechobee, FL 34972

Spectrum Laboratories
630 Indian St.
Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 3 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Lab ID: 15J0063-01
Client Sample ID: 65 Feet
Matrix: Water

Collection Date: 10/01/15 11:15
Received Date: 10/02/15 14:00
Collected By: Thomas Knox

Laboratory Analysis Report

| Parameter | Result | QC | Units | Dil | MDL | PQL | Method | Date Ext. | Date Analy. | Analyst |
|-----------|--------|----|-------|-----|-----|-----|--------|-----------|-------------|---------|
|-----------|--------|----|-------|-----|-----|-----|--------|-----------|-------------|---------|

Wet Chemistry

| | | | | | | | | | | |
|------------------------|-------|--|------|---|------|------|--------------|-------------|-------------|-----|
| Total Dissolved Solids | 10300 | | mg/L | 1 | 10.0 | 30.0 | TDS SM 2540C | 10/05 11:30 | 10/06 12:10 | YBR |
|------------------------|-------|--|------|---|------|------|--------------|-------------|-------------|-----|

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 4 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Lab ID: 15J0063-02
Client Sample ID: 70 Feet
Matrix: Water

Collection Date: 10/01/15 11:20
Received Date: 10/02/15 14:00
Collected By: Thomas Knox

Laboratory Analysis Report

| Parameter | Result | QC | Units | Dil | MDL | PQL | Method | Date Ext. | Date Analy. | Analyst |
|------------------------|--------|----|-------|-----|------|------|--------------|-------------|-------------|---------|
| Wet Chemistry | | | | | | | | | | |
| Total Dissolved Solids | 17200 | | mg/L | 1 | 10.0 | 30.0 | TDS SM 2540C | 10/05 11:30 | 10/06 12:10 | YBR |

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 5 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Lab ID: 15J0063-03
Client Sample ID: 75 Feet
Matrix: Water

Collection Date: 10/01/15 11:30
Received Date: 10/02/15 14:00
Collected By: Thomas Knox

Laboratory Analysis Report

| Parameter | Result | QC | Units | Dil | MDL | PQL | Method | Date Ext. | Date Analy. | Analyst |
|------------------------|--------|----|-------|-----|------|------|--------------|-------------|-------------|---------|
| Wet Chemistry | | | | | | | | | | |
| Total Dissolved Solids | 15700 | | mg/L | 1 | 10.0 | 30.0 | TDS SM 2540C | 10/05 11:30 | 10/06 12:10 | YBR |

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 6 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Lab ID: 15J0063-04
Client Sample ID: 80 Feet
Matrix: Water

Collection Date: 10/01/15 11:35
Received Date: 10/02/15 14:00
Collected By: Thomas Knox

Laboratory Analysis Report

| Parameter | Result | QC | Units | Dil | MDL | PQL | Method | Date Ext. | Date Analy. | Analyst |
|------------------------|--------|----|-------|-----|------|------|--------------|-------------|-------------|---------|
| Wet Chemistry | | | | | | | | | | |
| Total Dissolved Solids | 18200 | | mg/L | 1 | 10.0 | 30.0 | TDS SM 2540C | 10/05 11:30 | 10/06 12:10 | YBR |

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 7 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Wet Chemistry - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|-----------------|-------|-------------|--|------|-------------|------|-----------|-------|
| Batch 1510085 - Default Prep GenChem | | | | | | | | | | |
| Blank (1510085-BLK1) | | | | | Prepared: 10/05/2015 Analyzed: 10/06/2015 | | | | | |
| Total Dissolved Solids | ND | 30.0 | mg/L | | | | | | | U |
| LCS (1510085-BS1) | | | | | Prepared: 10/05/2015 Analyzed: 10/06/2015 | | | | | |
| Total Dissolved Solids | 488 | 30.0 | mg/L | 500.0 | | 97.6 | 70-130 | | | |
| Duplicate (1510085-DUP1) | | | | | Source: 15J0062-02 Prepared: 10/05/2015 Analyzed: 10/06/2015 | | | | | |
| Total Dissolved Solids | 10800 | 30.0 | mg/L | | 10600 | | | 2.24 | 20 | |
| Duplicate (1510085-DUP2) | | | | | Source: 15J0072-04 Prepared: 10/05/2015 Analyzed: 10/06/2015 | | | | | |
| Total Dissolved Solids | 390 | 30.0 | mg/L | | 384 | | | 1.55 | 20 | |

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401



Report To:
 Jean M. Mazza
 Tierra Consulting Group Inc.
 5815 North Andrews Way, Suite B
 Fort Lauderdale FL, 33309

Page 8 of 8
Report Printed: 10/12/2015
Work Order # 15J0063
Project: 16053 Gerry Curtis Park
 1901 NW 24th Avenue, Miami, FL 33124

Notes and Definitions

- U Indicated that the compound was analyzed for but not detected. This shall be used to indicate that the specific component was not detected. The value associated with the qualifier shall be the laboratory method detection limit.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the detection limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- V Indicated that the analyte was detected in both the sample and the associated method blank.
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- Z Too many colonies were present for accurate counting.

QC=Qualifier Codes as defined by DEP 62-160
 Unless indicated, soil results are reported on actual (wet) weight basis.
 Work performed by outside (subcontracted) labs denoted by SUB in Analyst Field.
 Results relate only to this sample.

Enrique Ochoa - CSM

Authorized CSM Signature (954) 978-6400
 Florida-Spectrum Environmental Services, Inc.
 Certification# E86006

All NELAP certified analysis are performed in accordance with Chapter 64E-1 Florida Administrative code, which has been determined to be equivalent to NELAC standards. Analysis certified by programs other than NELAP are designated with a "~".

Florida-Spectrum Environmental Services, Inc.
 1460 W. McNab Road, Fort Lauderdale, FL 33309

Pembroke Laboratory
 528 Gooch Rd.
 Fort Mead, FL 33841

Big Lake Laboratory
 610 Parrot Ave. N.
 Okeechobee, FL 34972

Spectrum Laboratories
 630 Indian St.
 Savannah, GA 31401

