
RTS Waste Water Recycling System Report Gainesville, Florida

Prepared for

Paul Starling
City of Gainesville
Regional Transit System
100 SE 10th Avenue
Gainesville, Florida 32602

Prepared by

Water & Air Research, Inc.
6821 S.W. Archer Road
Gainesville, Florida 32608

June 2005
05-5373-06

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1 Introduction

This report summarizes results and findings of recent soil and groundwater assessment conducted in the vicinity of the former waste water recycling system at the City of Gainesville Regional Transit System (RTS) property (also referred to as the subject property). The subject property address is 100 SE 10th Avenue, Gainesville, Florida. The subject property and approximate location of the former waste water recycling system on the property is shown in Figure 2. The assessment area is beneath a small wastewater recycling system that was formerly used to treat water generated during bus maintenance activities.

Soil and groundwater assessment activities were initiated following recent removal of the system and underlying pavement. The assessment was required by the Alachua County Environmental Protection Department (ACEPD). The ACEPD also approved the workscope.

The objective of this work was to screen the area underneath the former system for the presence of soil and groundwater impacts resulting from past discharges.

2 Site History

Groundwater and soil assessment activities were conducted to the east of the specified area when an overflow of contaminated water occurred several years ago. The area underlying the concrete pad (the area of interest in this report), was not addressed at the time due to the presence of equipment and limited access.

Previous testing identified soil contaminated by total petroleum hydrocarbons (TPH) and limited groundwater impacts. Contaminated soil was excavated, removed, and documented in previous reports. The remediated area was granted a Site Rehabilitation Completion Order from the ACEPD.

As discussed in Section 1, the ACEPD has reviewed and approved the proposal by Water & Air to perform limited soil and groundwater assessment in the vicinity of the former wastewater recycling system.

3 Site Assessment Activities

Site assessment activities were conducted on May 10, 2005. Site features and sample locations are provided in Figure 3.

The following technical activities were completed as part of environmental testing:

- Created a grid with 11 foot by 19 foot spacing overlying the former location of the waste water recycling system.
- Collected soil samples at 2-foot vertical intervals down to shallow groundwater at the grid points for field screening using an organic vapor meter (OVM).
- Installed and sampled a single temporary groundwater monitoring well at an area exhibiting the highest OVM reading or near the center of the former location of the recycling system.

3.1 Soil Screening and Sampling Methodology

A soil grid was created overlying the area. The size and extent of the impacted area did not change based on OVM screening data. Fifteen soil borings, labeled as A1 through C5, were installed overlying the site. Two samples were collected from each location for a total of 30 samples. One soil boring, labeled as WR-W-1/WR-SB-1, was installed near the center of the site where soil was collected for vapor screening and laboratory analysis and a shallow monitoring well was installed. Sample names were derived from the grid point location and sample depth. For example, A1-2 indicates the sample was collected from grid location A1 at 2 feet below land surface (ft-bls).

Soil borings were installed using a stainless steel hand auger. Samples were collected and screened at 2-foot vertical intervals beginning at the land surface to 4-ft-bls.

During soil boring installation, non-saturated soil was collected for field screening using the OVM to detect the presence of petroleum vapors. Soil screening was performed using an OVM equipped with a Photo Ionization Detector (PID). Soil headspace testing procedures included calibrating the PID using 245-ppm isobutylene standard calibration gas. The response factor for the OVM was set at 1.80.

At each sampling interval, soil was placed into separate 16-ounce glass jars, filled to approximately half-capacity, and covered to obtain 50 percent headspace above the soil sample. After collection, samples were allowed to equilibrate for at least five minutes before screening.

A single temporary groundwater monitoring well was installed in the center of the recycling system since no OVM readings were identified above background or 0 parts per million (ppm) except in soil boring C-4-4' which generated a response of 1- ppm. The center of the area is expected to be representative of the worst case scenario underneath the former wastewater recycling system pump.

Based on the lack of soil vapor headspace screening results, only one soil sample was collected for laboratory analysis rather than three samples representative of low, medium, and high OVM screening results. Soil sample WR-SB-1 was collected at 3.5 ft-bls and analyzed for total recoverable petroleum hydrocarbons (TPH) by the FL-PRO Method. Only TPH was selected as it was the only documented soil contaminant identified during previous assessment of the area to the east of the wastewater recycling system.

PC&B Environmental Laboratories, Inc. (PC&B), of Oviedo, Florida, provided laboratory analytical services. Figure 3 depicts soil screening testing locations. Laboratory data sheets and chains-of-custody (COC) are provided in Appendix B.

3.2 Temporary Monitoring Well Installation

Because shallow groundwater was present less than 5 ft-bls, temporary monitoring well WR-W-1 was installed to determine if groundwater impacts were present at the site. The well was installed using a stainless steel hand auger due to the shallow depth to groundwater. Groundwater was encountered at approximately 4.45 ft-bls during the installation of monitoring well WR-W-1.

The well was installed to 7.10 ft-bls using 5 feet of 2-inch diameter, Schedule 40, machine slotted screen and 3 feet of 2-inch diameter, Schedule 40 riser.

After inserting the well materials into the boring, the annular space was backfilled with 20/30 silica sand filter pack. Well WR-W-1 was developed after installation to remove fines generated during installation activities.

3.3 Groundwater Sampling Methodology

Groundwater purging and sampling was conducted at the well using a variable-speed peristaltic pump with dedicated, disposable high-density polyethylene (HDPE) tubing. Prior to sampling, the wells were purged of approximately 4.0 gallons of groundwater.

The well was developed until turbidity measured below 20 NTUs. Groundwater extracted during well development and purging activities was discharged onto an asphalt surface near the well to permit volatilization. Groundwater samples collected from WR-W-1 were analyzed to detect all volatile organic compounds (VOC) and PAH by EPA Methods 8021 and 8310, respectively, and for TPH by the FL-PRO Method.

Groundwater samples for VOCs were collected by removing the drop tube from the well and evacuating liquid from the HDPE tubing through reversing the pump direction. This method is used to prevent sample water from interacting with the silicone tubing in the pump head. Groundwater samples collected for PAH and TPH analysis were collected using Teflon® inline vacuum trap caps secured directly to the sample tubing prior to the pump.

After collection, groundwater samples were placed in a cooler containing wet ice and sent to the laboratory with the completed COC form. PC&B provided laboratory analytical services.

4 Results and Findings

Soil excavation was not needed according to a soil and groundwater assessment conducted on May 10, 2005, in the vicinity of the wastewater recycling system at the Regional Transit System.

4.1 Soil Vapor Screening and Laboratory Verification Results and Findings

All soil vapor readings were 0-ppm with the exception of C-4-4', which generated a response of 1-ppm. Soil boring C-4-4' was collected from the east corner of the sample grid. This low level is likely the result of fluctuation of the meter relative to background. If caused by organic vapors, this concentration is well below regulatory action levels.

Laboratory analysis of soil sample WR-SB-1 detected TPH at a concentration of 67.1 mg/kg, below the FDEP Soil Cleanup Target Level (SCTL) for TPH of 340 mg/kg.

4.2 Groundwater Analytical Results

The only analyte detected in well WR-W-1 was TPH at a concentration of 1.3 mg/L, which is below the TPH Groundwater Cleanup Target Level (GCTL) of 5 mg/L. No VOCs and PAHs were identified above laboratory detection limits. Laboratory analytical results and COCs are provided in Appendix B. Groundwater sampling field forms are provided in Appendix C.

5 Conclusions

- No evidence of soil contamination based on OVM screening was encountered at the former wastewater recycling system.
- Impacts from TPH were encountered at concentrations below regulatory cleanup target levels.
- TPH was the only analyte detected in groundwater at a concentration below its regulatory cleanup target level. No other analytes were identified above laboratory detection limits.

6 Recommendations

Results and findings from soil and groundwater assessment underneath the former wastewater recycling system did not identify soil or groundwater contamination exceeding applicable cleanup target levels. Based on these findings, Water & Air

recommends that no additional environmental testing of this area is necessary and the site can be considered for a "Site Rehabilitation Completion Order".

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- 1 Aerial Photograph showing the Campus Expansion System Area and Regional Transit System Station 5, Gainesville, Florida.
- 2 Site Layout showing Groundwater and Soil Sampling Locations, Regional Transit System Station 5, 100 SE 10th Avenue, Gainesville, Florida.
- 3 Soil Groundwater Testing Locations at the Former Wastewater Recycling System, Regional Transit System Station 5, 100 SE 10th Avenue, Gainesville, Florida.

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- 1Soil Screening Summary
- 2 Groundwater Analytical Data
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Appendices

- A Soil and Groundwater Laboratory Results
- B Site Photographs

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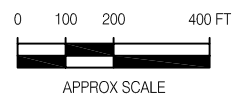
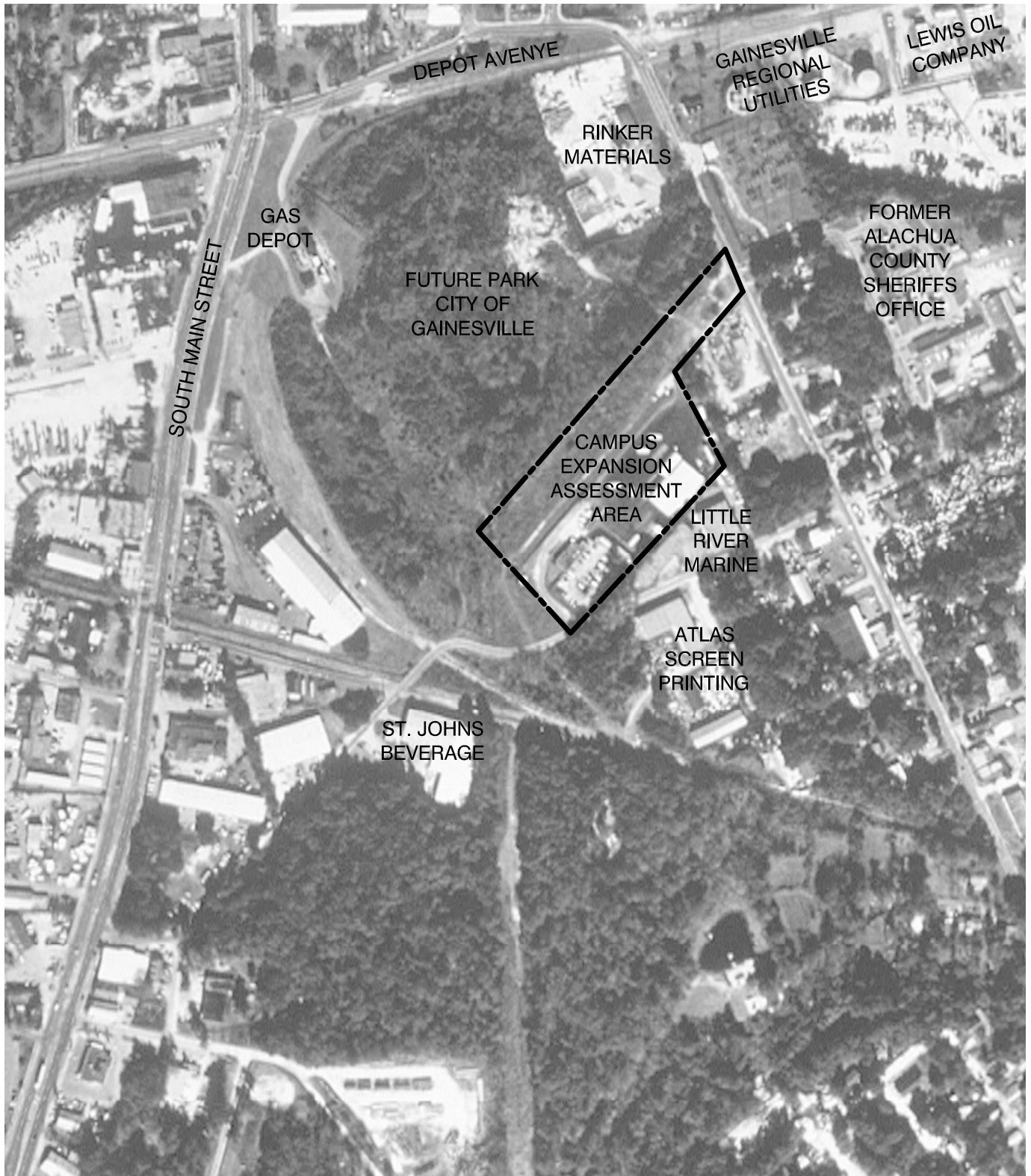


FIGURE 1.
1999 AERIAL PHOTOGRAPH SHOWING
THE CAMPUS EXPANSION ASSESSMENT AREA AND VICINITY, REGIONAL TRANSIT SYSTEM
GAINESVILLE, FLORIDA

Source: LABINS, 1999; Water & Air Research, Inc., 2004.



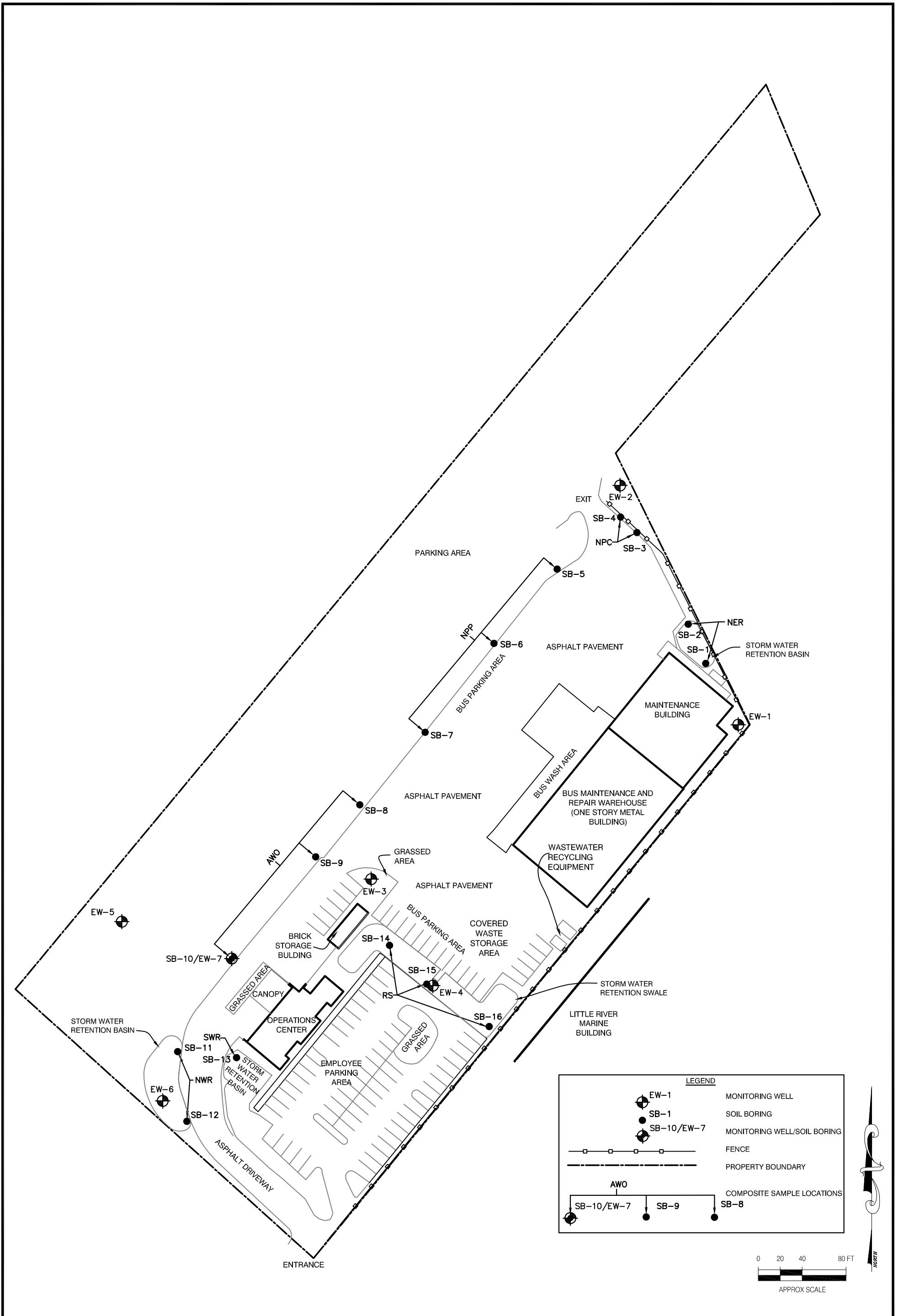


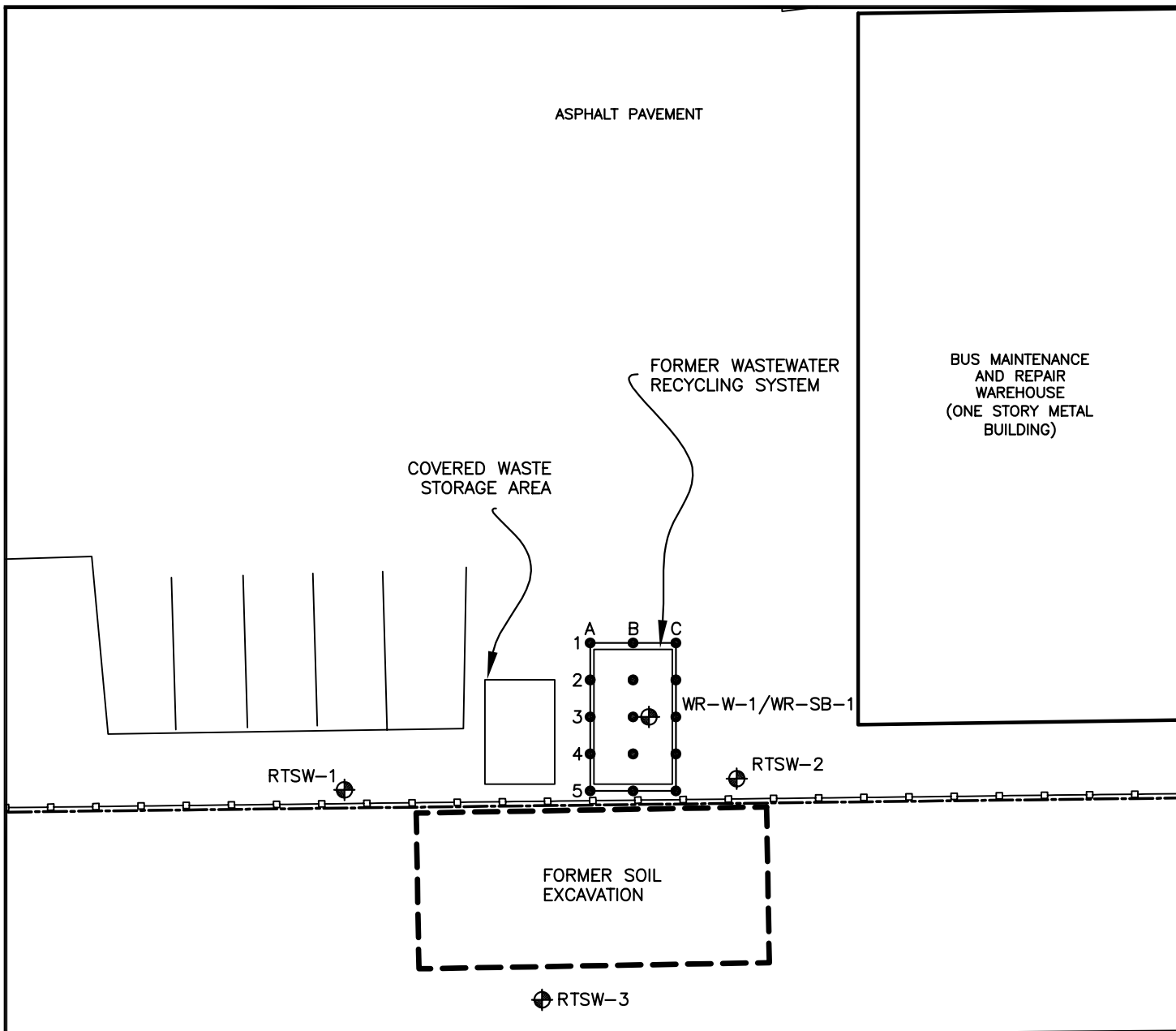
FIGURE 2.
SITE LAYOUT SHOWING GROUNDWATER AND SOIL SAMPLING LOCATIONS
REGIONAL TRANSIT SYSTEM CAMPUS EXPANSION
GAINESVILLE, FLORIDA

Source: Water & Air Research, Inc., 2004.



water & air
RESEARCH, INC.

J:\03-5720101\dwg\DWG_2005\FIG_03.dwg, FIGURE 3, 12/15/2006 3:00:55 PM, mcheaney



LITTLE RIVER MARINE BUILDING

LEGEND

RTSW-3 MONITORING WELL

WR-W-1/WR-SB-1 TEMPORARY MONITORING WELL/
SOIL BORING LOCATION

ORGANIC VAPOR METER SCREENING LOCATION

GRAPHIC SCALE

0 5 10 20 FT

SCALE IN FEET (APPROXIMATE)



FIGURE 3.
 SOIL GROUNDWATER TESTING LOCATIONS AT THE FORMER WASTEWATER RECYCLING SYSTEM,
 REGIONAL TRANSIT SYSTEM STATION 5, 100 S.E. 10th AVENUE
 GAINESVILLE, FLORIDA

Source: Water & Air Research, Inc., 2002-2005.



Tables

TABLE 1: SOIL SCREENING SUMMARY

Facility Name: RTS Waster Water Recycling System

BORING NO.	DATE COLLECTED	SAMPLE DEPTH (ft)	TOTAL READING (ppm)	BACKGROUND READING (ppm)	CORRECTED READING (ppm)	COMMENTS
A-1	05/10/05	2	0	0		
	05/10/05	4	0	0		
A-2	05/10/05	2	0	0		
	05/10/05	4	0	0		
A-3	05/10/05	2	0	0		
	05/10/05	4	0	0		
A-4	05/10/05	2	0	0		
	05/10/05	4	0	0		
A-5	05/10/05	2	0	0		
	05/10/05	4	0	0		
B-1	05/10/05	2	0	0		
	05/10/05	4	0	0		
B-2	05/10/05	2	0	0		
	05/10/05	4	0	0		
B-3	05/10/05	2	0	0		
	05/10/05	4	0	0		
B-4	05/10/05	2	0	0		
	05/10/05	4	0	0		
B-5	05/10/05	2	0	0		
	05/10/05	4	0	0		
C-1	05/10/05	2	0	0		
	05/10/05	4	0	0		
C-2	05/10/05	2	0	0		
	05/10/05	4	0	0		
C-3	05/10/05	2	0	0		
	05/10/05	4	0	0		
C-4	05/10/05	2	0	0		
	05/10/05	4	1	0		
C-5	05/10/05	2	0	0		
	05/10/05	4	0	0		

TABLE 2: GROUNDWATER ANALYTICAL DATA

Facility Name: RTS Waste Water Recycling System

Sample		Laboratory Analytes									
Location	Date	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE	TRPH	Naphthalene	1-Methyl-Naphthalene	2-Methyl-Naphthalene	Acenaphthylene
GCTLs		1	40	30	20	50	5000	20	20	20	210
WR-W-1	05/10/05	<1	<1	<1	<1	<5	1300	<1	<0.12	<0.17	<0.45

*GCTL = Groundwater Clean-up Target Level (ug/L)

*All analytes reported in ug/L

TABLE 3: SOIL ANALYTICAL DATA

Facility Name: RTS Waste Water Recycling System

Sample		OVA			
Boring No.	Date Collected	Sample Depth (fbls)	Net OVA Reading (ppm) SCTLs	TRPHs (mg/kg) 340	Comments
WR-SB-1	5/10/2005			67.1	

SCTLs = Soil Cleanup Target Levels as Referenced in F.A.C. 62-777 Table II

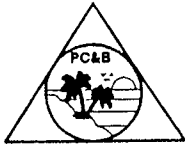
NR = Not Referenced in F.A.C. 62-777 Table II

Bold Values Indicate SCTL Exceedences

NS = Not sampled

Appendix A

Soil and Groundwater Laboratory Results



PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765
Phone: 407-359-7194 Fax: 407-359-7197

05-17-2005

Scott Burgard
Water and Air Research, Inc.
6821 S. W. Archer Road
Gainesville, FL 32608-

Dear Scott Burgard:

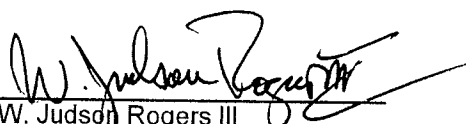
Enclosed are the results of the analysis of your samples received 05/11/2005.

Our laboratory is NELAP certified by the Florida DOH (Lab #E83239) and operates under an NELAP approved Quality Assurance Plan. Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983, or later and/or Standard Methods for the examination of Water and Wastewater, 20th Edition 1999, or later and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995, or later), unless stated otherwise in our ComQapp under method modifications.

Test results meet all of the requirements of the NELAC Standards.

If you have any questions, please do not hesitate to give me a call.

Sincerely,


W. Judson Rogers III
Quality Assurance Officer

PC&B Environmental Laboratories, Inc.

210 Park Road
Oviedo, FL 32765-8801
407-359-7194 - (FAX) 407-359-7197

Case Narrative

Scott Burgard
Water and Air Research, Inc.
6821 S. W. Archer Road
Gainesville, FL 32608-

CASE NARRATIVE for Work Order: 205050109
Project Number:
Project Name: RTS Waste Water Recycling Sys

This Case Narrative is a summary of events and/or problems encountered with this Work Order.

For samples requesting EPA 8021 analysis, the GCMS method EPA 8260 was substituted in order to generate the highest quality data possible at no additional cost.

Definition of Flags

A = Value reported is an average of 2 or more determinations
DL = No surrogate result due to dilution or matrix interference.
H = Value based on field kit determination, results may not be accurate
I = The reported value is between MDL and PQL
J = Estimated Value, value not accurate.
J1 = Estimated value surrogate limits have been exceeded
J4 = Estimated value matrix interference
K = Off scale low
L = Off-scale high. Actual value is greater than value given. Above calibration curve.
M = Presence of material is verified but not quantified. Should be lab PQL
N = Presumptive evidence of presence of material
Q = Sample analyzed beyond the accepted holding time.
T = Value less than the lab MDL
T2 = Analysis from an unpreserved or improperly preserved sample
V = Analyte was both detected in the method blank and sample.
Y = Analysis from an unpreserved or improperly preserved sample

PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765-8801
PHONE: 407-359-7194
FAX: 407-359-7197

Report of Analysis
Volatile Organics

CLIENT NAME: Water and Air Research, Inc.
PROJECT NAME: RTS Waste Water Recycling Sys
PROJECT NUMBER:
DATE RECEIVED: 05/11/2005
ANALYTICAL PROTOCOL: EPA 8021by 8260

Lab Reference Number	205050109-1
Client Sample ID	WR-W-1
Date/Time Sampled	05/10/2005 14:27
Date/Time Extracted	05/11/2005
Date/Time Analyzed	05/11/2005 20:34
Sample Matrix (as Received)	Water
Analysis Confirmed	GCMS
Dilution Factor	1
Result Units	ug/l

MTBE	5.0 U
m & p-Xylene	1.0 U
1,2-Dibromoethane	1.0 U
o-Xylene	1.0 U
(Surr) 1,2-Dichloroethane-d4 (%)	120
(Surr) Toluene-d8 (%)	98
(Surr) 4-Bromofluorobenzene (%)	100

U = Undetected. The value preceding the 'U' is the RL for the analyte, based on dilution. Results reported on a Wet Weight basis.

NELAP- FDOH Certification # E83239

Reviewed by : _____



PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765-8801
PHONE: 407-359-7194
FAX: 407-359-7197

Report of Analysis
PAH's by HPLC

CLIENT NAME: Water and Air Research, Inc.
PROJECT NAME: RTS Waste Water Recycling Sys
PROJECT NUMBER:
DATE RECEIVED: 05/11/2005
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	205050109-1
Client Sample ID	WR-W-1
Date/Time Sampled	05/10/2005 14:27
Date/Time Extracted	05/11/2005
Date/Time Analyzed	05/12/2005 19:59
Sample Matrix (as Received)	Water
Analysis Confirmed	No
Dilution Factor	1
Result Units	ug/l

Acenaphthene	0.52 U
Acenaphthylene	0.45 U
Anthracene	0.02 U
Benzo(a)anthracene	0.02 U
Benzo(a)pyrene	0.03 U
Benzo(b)fluoranthene	0.01 U
Benzo(ghi)perylene	0.05 U
Benzo(k)fluoranthene	0.02 U
Chrysene	0.03 U
Dibenzo(ah)anthracene	0.20 U
Fluoranthene	0.03 U
Fluorene	0.14 U
Indeno (1,2,3-c,d) pyrene	0.04 U
Naphthalene	0.29 U
1-Methyl naphthalene	0.12 U
2-Methyl naphthalene	0.17 U
Phenanthrene	0.06 U
Pyrene	0.08 U
(Surr) Decafluorobiphenyl (%)	0 ND

U = Undetected. The value preceding the 'U' is the RL for the analyte, based on dilution. Results reported on a Wet Weight basis.

NELAP- FDOH Certification # E83239

Reviewed by : 

PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765-8801
PHONE: 407-359-7194
FAX: 407-359-7197

Report of Analysis
Petroleum Hydrocarbons

CLIENT NAME: Water and Air Research, Inc.
PROJECT NAME: RTS Waste Water Recycling Sys
PROJECT NUMBER:
DATE RECEIVED: 05/11/2005
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number	205050109-1
Client Sample ID	WR-W-1
Date/Time Sampled	05/10/2005 14:27
Date/Time Extracted	05/11/2005
Date/Time Analyzed	05/12/2005 15:10
Sample Matrix (as Received)	Water
Analysis Confirmed	No
Dilution Factor	1
Result Units	mg/l

Total PHS	1.3
(Surr) C-39 (%)	84
(Surr) OTP (%)	105

U = Undetected. The value preceding the 'U' is the RL for the analyte, based on dilution. Results reported on a Wet Weight basis.

NELAP- FDOH Certification # E83239

Reviewed by : _____



PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765-8801
PHONE: 407-359-7194
FAX: 407-359-7197

Report of Analysis
Petroleum Hydrocarbons

CLIENT NAME: Water and Air Research, Inc.
PROJECT NAME: RTS Waste Water Recycling Sys
PROJECT NUMBER:
DATE RECEIVED: 05/11/2005
ANALYTICAL PROTOCOL: FL-PRO

Lab Reference Number	205050109-2
Client Sample ID	WR-SB-1
Date/Time Sampled	05/10/2005 13:50
Date/Time Extracted	05/12/2005
Date/Time Analyzed	05/13/2005 11:33
Sample Matrix (as Received)	Soil
Analysis Confirmed	No
Dilution Factor	1
Percent Moisture	18.0
Result Units	mg/kg

Total PHS	67.1
(Surr) C-39 (%)	123
(Surr) OTP (%)	110

U = Undetected. The value preceding the 'U' is the RL for the analyte, based on dilution. Results reported on a Dry Weight basis.

NELAP- FDOH Certification # E83239

Reviewed by : _____



PC&B Environmental

210 Park Road, Oviedo, FL 32765
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order: 205050109

Date: 5/10/05 Page 1 of 1

COMPANY: Water and Air Research Inc

ADDRESS: 6821 SW Archer Rd

SAMPLED BY: David Dilati SIGN: [Signature]

PHONE: 352-372-1500 FAX: 352-372-1560

#	SAMPLE ID	DATE/TIME	MATRIX				PRESERVATION	ANALYSIS REQUESTED
			AIR	WATER	SLUDGE	SOIL/SOLID		
1	WR-U-1	5/10/05 1427		X				
2	WR-SB-1	5/10/05 1350				X		
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

RELINQUISHED BY: [Signature] DATE/TIME: 5/10/05 1500

RECEIVED BY: [Signature] DATE/TIME: 5-11-05 10:30

PROJECT NAME: Waste Water Recycling System

PROJECT #: 5-11-05

SITE ADDRESS: Cainville Fl

PROJECT MANAGER: [Signature]

INVOICE TO: [Signature]

COOLER RECEIVED @ 3°C

PROJECT INFORMATION

SAMPLE RECEIPT

Total # of Containers

Chain of Custody Seals

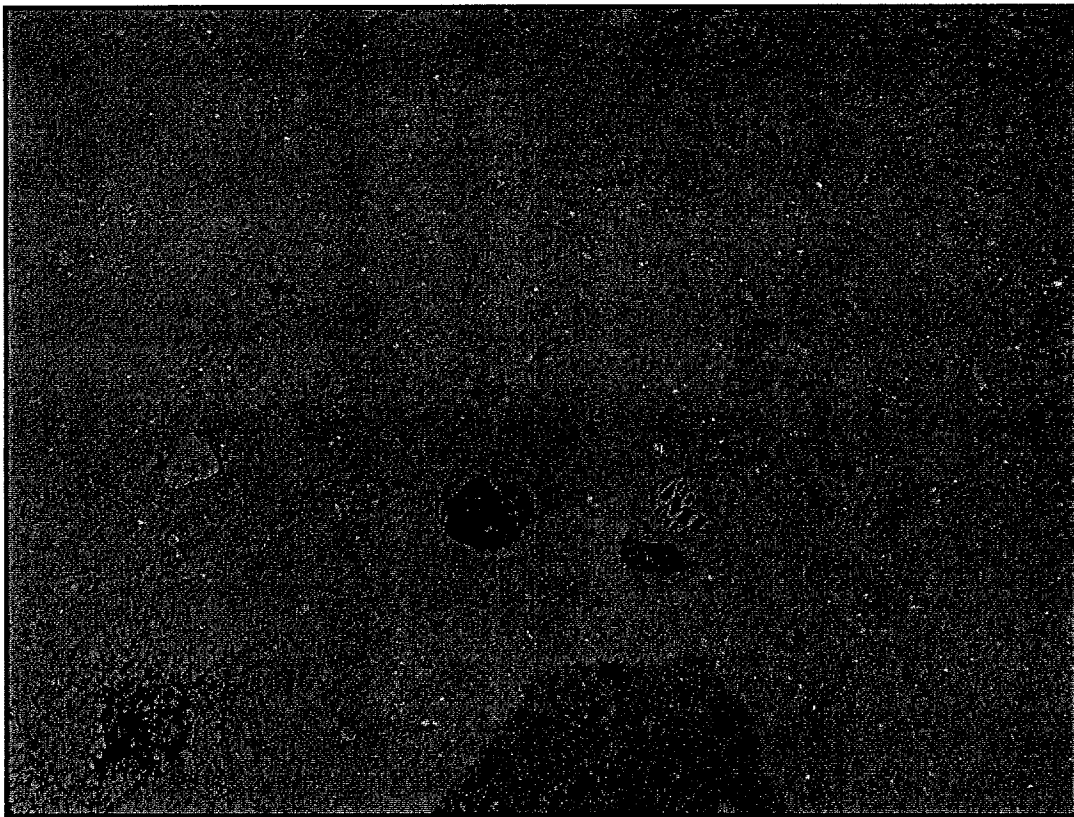
Rec'd In Good Condition

PO #:

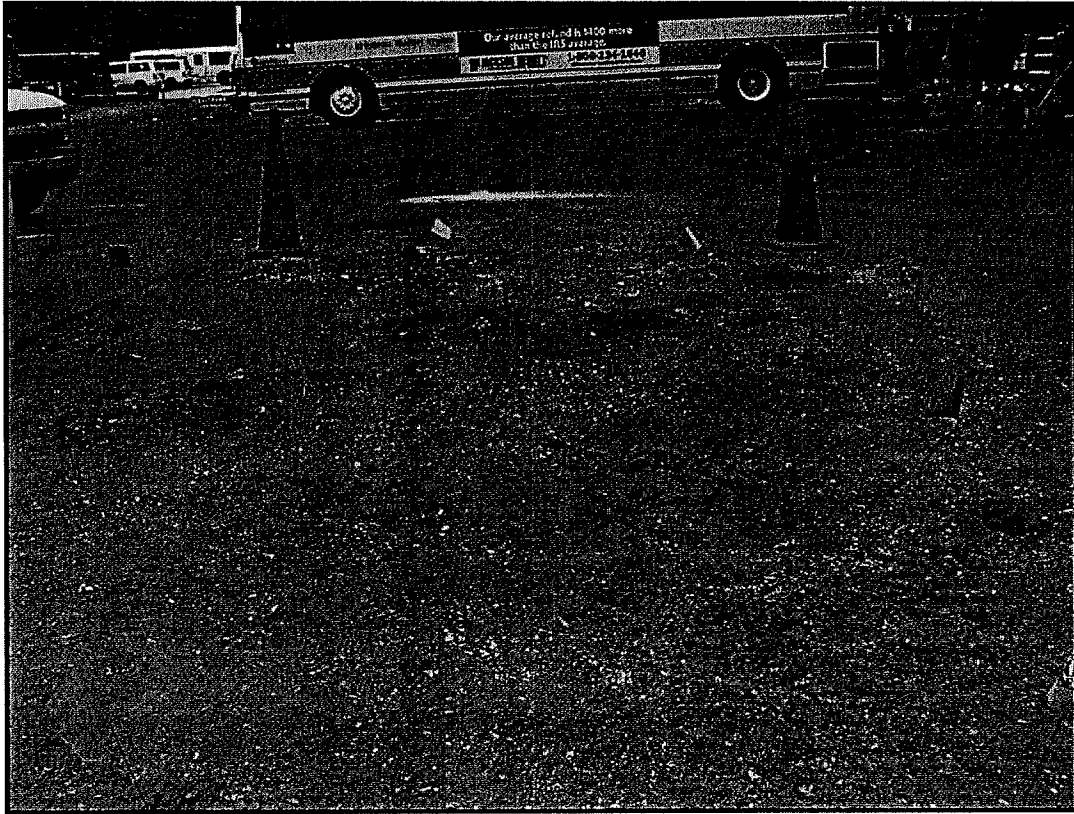
Appendix B
Site Photographs



Soil Grid Overlying Waste Water Recycling Area



Soil Boring in Recycling Area at RTS Waste Water System



Soil Grid at RTS Waste Water Recycling System looking towards site from fence