

**CITRUS COUNTY LANDFILL
WATER QUALITY SAMPLING DATA REPORT**

Prepared For

CITRUS COUNTY
Department of Public Works
Lecanto, Florida

Prepared By

LAW ENVIRONMENTAL, INC.
(Formerly Seaburn and Robertson)
Environmental and Water Resource Consultants
Tampa, Florida

January, 1988

D. J.

JAN 28 1988

SOUTH WEST DISTRICT



LAW ENVIRONMENTAL, INC.

5510 GRAY STREET, SUITE 118
TAMPA, FLORIDA 33609
P.O. BOX 23184
TAMPA, FLORIDA 33623
813-877-9182

January 18, 1988

PN 57-6208.01

Mr. Steve Morgan
Florida Department of Environmental Regulation
7601 Highway 301 North
Tampa, Florida 33610

RE: Citrus County Landfill, Ground-water Monitoring Report,
Permit No. MP09-112294

Dear Mr. Morgan:

Please find enclosed three copies of our data report of water quality sampling and analysis of ground-water from monitor wells at the Citrus County Landfill. This report includes field and laboratory data for the fourth quarter sampling event of 1987.

Please review the report at your convenience and do not hesitate to contact us if you have any questions or comments.

Sincerely,

LAW ENVIRONMENTAL, INC.

T. Jay McAllister
Project Hydrogeologist

Susan J. Metcalfe, CPGS
Senior Hydrogeologist

SJM/TJM/gws

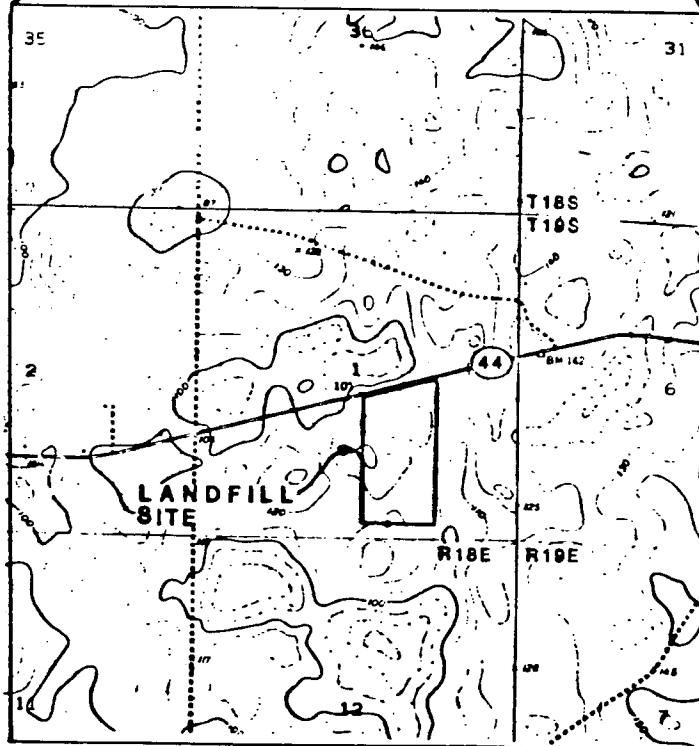
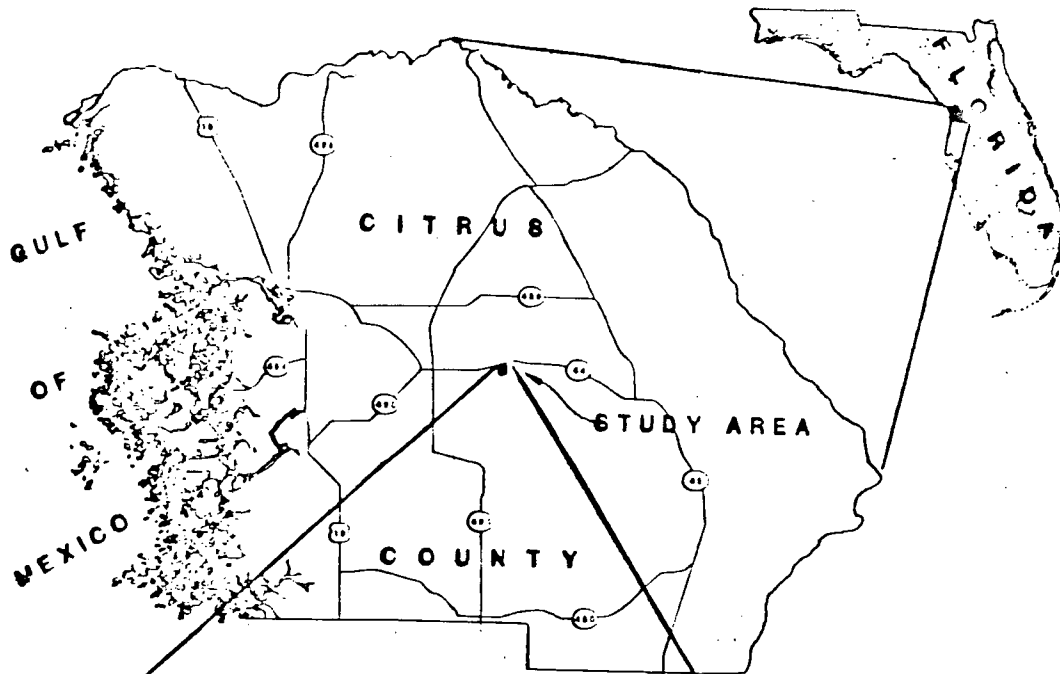
Enclosures

cc: Mr. Dick Berg - w/o enclosure
Citrus County

CITRUS COUNTY CENTRAL LANDFILL
WATER QUALITY SAMPLING DATA REPORT

INTRODUCTION

On December 17, 1986, Law Environmental, Inc., (formerly Seaburn and Robertson) was authorized by Citrus County to continue to sample, analyze and report groundwater quality at all monitor wells at the Citrus County Central Landfill (see Figure 1) on a quarterly basis for one year. This quarterly program is in compliance with Specific Conditions 5 and 6 of the Florida Department of Environmental Regulation (FDER) Permit Number MP09-112294. These Specific Conditions state that the permittee shall sample all ground-water monitoring wells annually for the Primary and Secondary Drinking Water Parameters included in Chapters 17-22, F.A.C. and sample quarterly for all Secondary Drinking Water Parameters with the addition of Nitrate, Sodium, Turbidity, Total Organic Carbon, Total Coliform, Temperature, Water Level (NGVD), Total Kjeldahl Nitrogen and Specific Conductance. Because of the continued detection of vinyl chloride in monitor well A (MW-A), the FDER requested that the sample analysis for all monitor wells include the volatile organic compounds in addition to the required parameters listed in the permit.



**CITRUS COUNTY BOARD
OF COUNTY
COMMISSIONERS**



**LAW ENVIRONMENTAL
INC.**

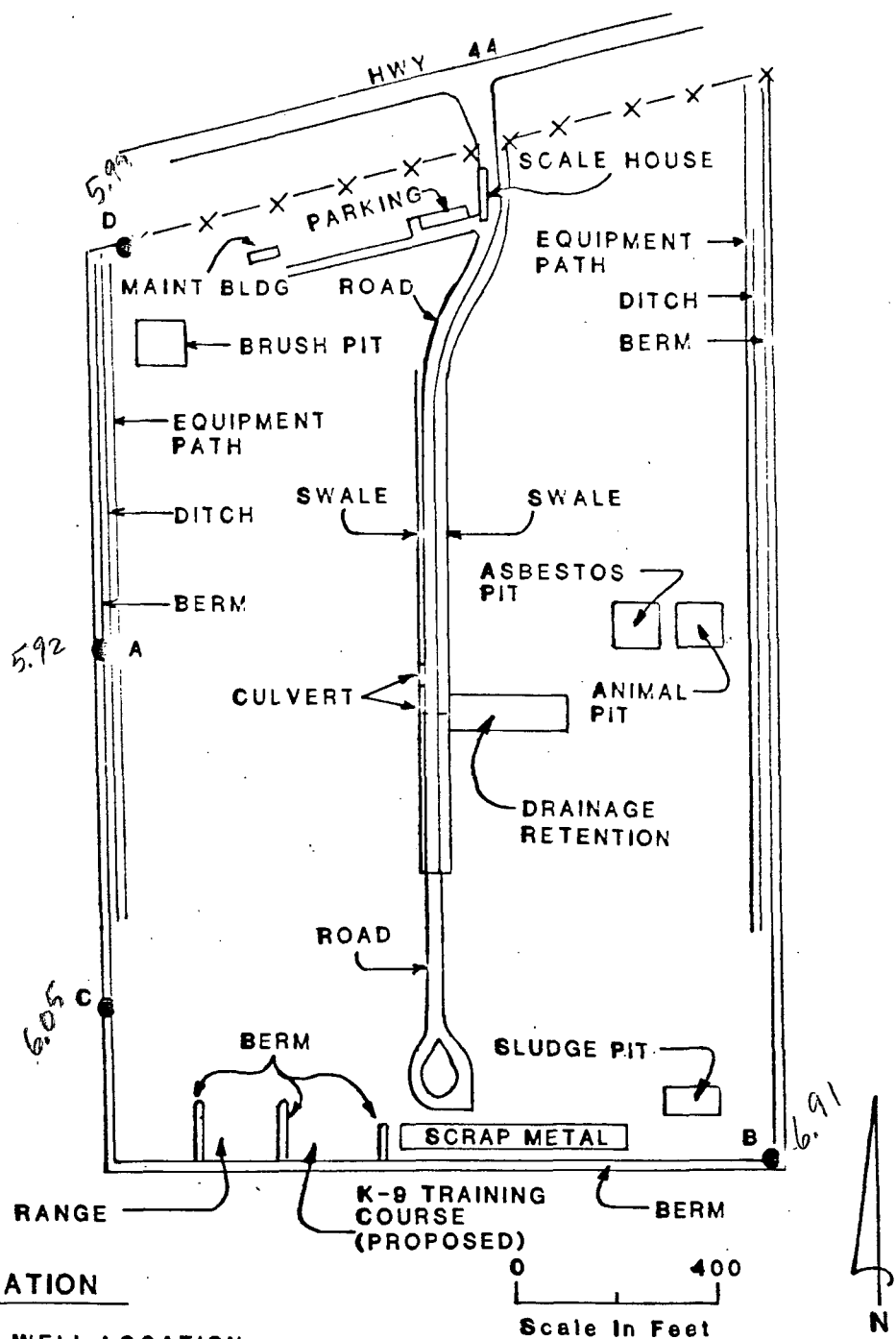
**CITRUS COUNTY LANDFILL
SITE LOCATION**

**JOB NO.
57620801**

FIGURE 1

Field Methods

Law Environmental, Inc., collected ground-water samples from four wells (see Figure 2) located at the county landfill near Lecanto on October 18, 1987. Additional samples for volatile organic analysis were collected from monitor wells B, C, and D on November 5, 1987. Prior to collection of water samples, ground-water levels were measured by the wetted steel tape method. The volume of water in the well casing was then calculated. Each well was pumped to remove stagnant water in the casing. Volumes equal to approximately 4.7 to 5.4 casings were removed with permanently installed submersible pumps. The submersible pumps at Wells A, B and C were powered by a Honda 3000 portable generator. The pump at Well D is wired to electrical power lines. Samples at Wells A, B and C were collected at the discharge valves located on top of the wells (see Figure 3). Samples at Well D were collected at a discharge valve on the outside of the well pumphouse. Field pH, temperature and specific conductance were measured in the sample retained for analysis. Table 1 lists results of the field measurements. Appropriate preservatives were placed in sampling bottles prior to sampling by the laboratory as part of sample kit preparation, and all samples were chilled during transportation to the



EXPLANATION

●^A MONITOR WELL LOCATION

SOURCE: CITRUS COUNTY, 1985

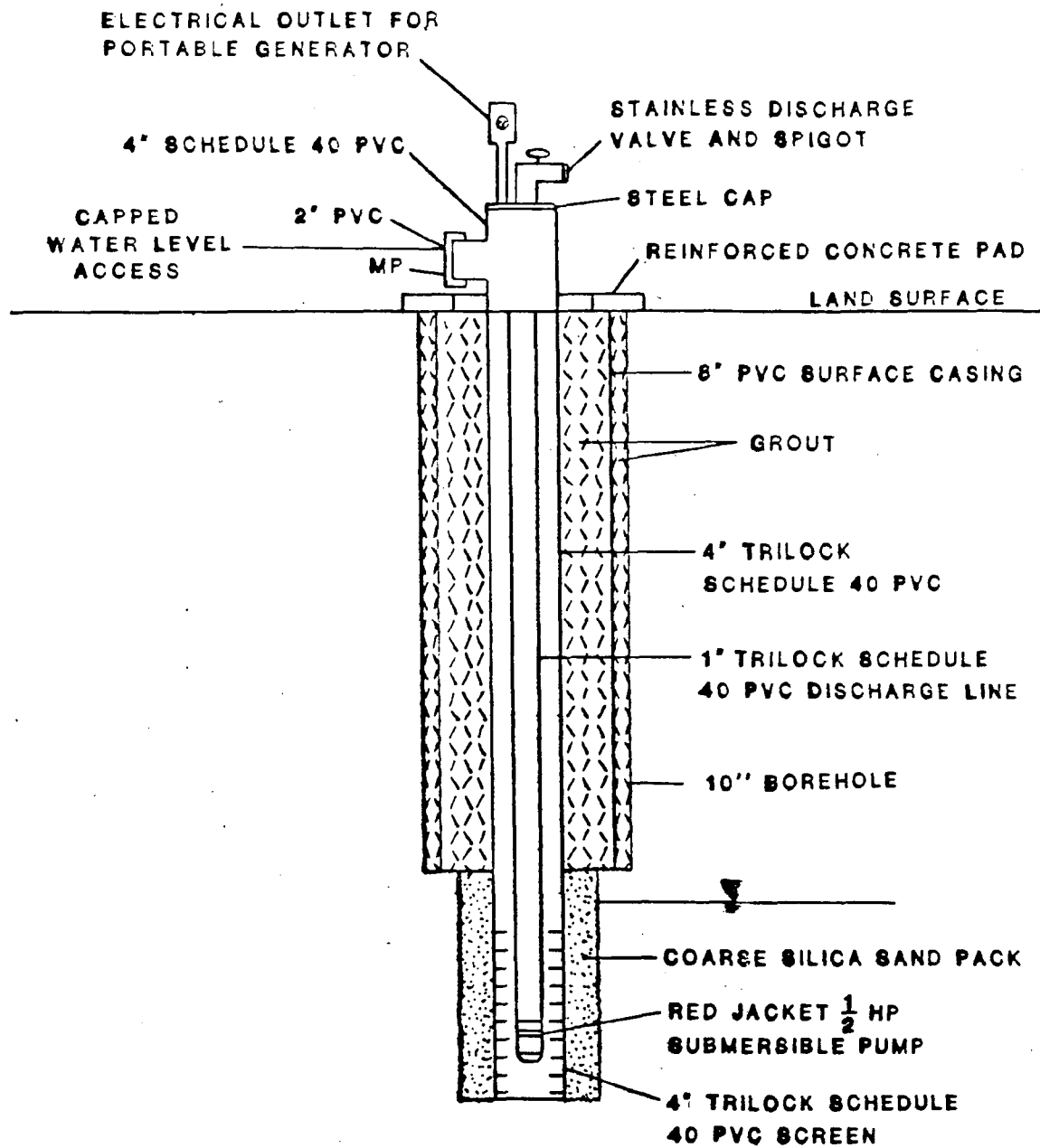
**CITRUS COUNTY BOARD
OF COUNTY
COMMISSIONERS**



**CITRUS COUNTY LANDFILL
MONITOR WELL LOCATIONS**

JOB NO.
57620801

FIGURE 2



CITRUS COUNTY BOARD
OF COUNTY
COMMISSIONERS



LAW ENVIRONMENTAL
INC.

CITRUS COUNTY LANDFILL
MONITOR WELL
CONSTRUCTION DETAILS

JOB NO.
57620801

FIGURE 3

Table 1. - October 28, 1987, Field Measurements - Citrus County Central Landfill.

Well	Total Depth (ft.)	Top of Measuring Point Above Land Surface (ft.)	Elevation of Measuring Point (ft. NGVD)	Depth to Water (ft.)	Elevation of Water Surface (ft. NGVD)	Casing Volume (gal)	Purge Volume(1) (gal)	Field pH (pH units)	Field Conductivity (umhos/cm)	Temperature (C)	Sample Appearance/Comments
NW-A	133	1.14	105.00	99.08	5.92	22.14	120	7.00	440	25.0	Clear, colorless, sl. effervescent, sl. odor
NW-B	128	1.25	112.46	105.55	6.91	14.66	69	5.05	30	23.0	V. Sl. turbid, V. lt. tan, no odor
NW-C	198	1.62	114.93	108.88	6.05	58.18	299	6.90	470	24.0	Clear sl. gray tint, sl. effervescent
NW-D	209	1.54	109.84	103.85	5.99	68.65	320	6.80	500	24.0	Clear and colorless, sl. odor

(1) Evacuated with permanent submersible pump.

laboratory. All samples were delivered to the water quality laboratory the day after the samples were collected, except for samples collected for total coliform which were delivered to a local laboratory the same day they were collected.

Water Quality

Results of the chemical analysis of the ground-water by Orlando Laboratories, Inc., were received on December 17, 1987. Appendix A lists the results of analyses on the four samples for the list of parameters designated by the FDER in Permit Number MPO9-112294 for quarterly monitoring, plus the volatile organic compounds included in Chapters 17-22 of the Florida Administrative Code. Laboratory quality assurance data is also presented. Appendix B is a transcription of the data onto the FDER report forms.

Field and laboratory measurements of pH indicated that monitor well B, the upgradient well which is completed in a sand unit, had a lower than acceptable (acid) pH. The reported value for corrosivity was -3.6 Langlier units, indicating that the sample is corrosive with respect to calcium carbonate.

Samples from monitor wells A, C, and D, the downgradient wells are completed in limestone units and were found to have positive Langlier values indicating that the samples are scale forming. Manganese exceeded the FDER standard in samples from wells A, C, and D.

The standard for vinyl chloride was exceeded at Monitor Well A. This was the fourth time that the the FDER standard for vinyl chloride has been exceeded at the Citrus County Landfill's monitor well A.

APPENDIX A

RECEIVED DEC 17 1987



Orlando Laboratories, Inc.

P. O. Box 19127 • Orlando, Florida 32814 • 305/895-6645

REPORT OF ANALYSIS

Seaburn & Robertson
Attn: Jay McAllister
Post Office Box 23184
Tampa, Florida 33623

Report #: 51133 (4196, 4262)
Sample submitted by: Client (TJM/KCS) *
Date sampled: 10/28-11/05/87 *
Date received: 10/29 & 11/06/87
Date reported: 12-15-87

Page 1 of 8

PURPOSE: To analyze the samples for listed parameters

AUTHORIZATION: Sample Identification Form received from J. McAllister

SAMPLE IDENTIFICATION: Samples submitted and identified by client as:

Citrus County Landfill: MW-A - 10-28-87 @ 1200 hrs.
MW-B 86208-001 - 11-05-87 @ 1335 hrs.
MW-C 86208-001 - 11-05-87 @ 1220 hrs.
MW-D 86208-001 - 11-05-87 @ 1125 hrs.

PROCEDURE: EPA METHOD 624

RESULTS:

RESULTS, mg/l

<u>PURGEABLE ORGANICS BY GC/MS</u>	<u>MW-A</u>	<u>MW-B</u>	<u>MW-C</u>	<u>MW-D</u>
Benzene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Bromodichloromethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Bromoform	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Bromomethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Carbon Tetrachloride	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Chlorobenzene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Chloroethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
2-Chloroethylvinyl ether	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Chloroform	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Chloromethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Dibromochloromethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1-Dichloroethane	0.002	ND(0.001)	ND(0.001)	ND(0.001)
1,2-Dichloroethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1-Dichloroethene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
trans-1,2-Dichloroethene	0.010	0.010	0.004	ND(0.001)
1,2-Dichloropropane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
cis-1,3-Dichloropropene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
trans-1,3-Dichloropropene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)

* Sampling information based on data supplied by client.
ND = None detected to the levels in parentheses.

Respectfully submitted,
ORLANDO LABORATORIES, INC.

B. Vanderstar
Laboratory Manager

Jeffery Richards
Quality Control

Seaburn & Robertson
Attn: Jay McAllister

Report #: 51133 (4196,3262)
Page 2 of 8

<u>PURGEABLE ORGANICS BY GC/MS - Cont.</u>	<u>MW-A</u>	<u>MW-B</u>	<u>MW-C</u>	<u>MW-D</u>
Styrene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1,2,2-Tetrachloroethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Tetrachloroethene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Toluene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1,1-Trichloroethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
1,1,2-Trichloroethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Trichloroethene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Trichlorofluoromethane	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Vinyl Chloride	0.004	ND(0.001)	ND(0.001)	ND(0.001)
meta - Xylene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
ortho, para - Xylene	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)

GC/MS VOLATILE SCAN

Acrolein	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Acrylonitrile	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
n-Hexane	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)

PROCEDURE: EPA METHOD FHRS
RESULTS:

MISCELLANEOUS PRIORITY POLLUTANTS

Ethylene Dibromide, ug/l	-----	ND(0.02)	ND(0.02)	ND(0.02)
--------------------------	-------	----------	----------	----------

Seaburn & Robertson
Attn: Jay McAllister

Report: 51133 (4196, 4262)
Page 3 of 8

PURPOSE: To analyze sample for Secondary Drinking Water Regulations

PROCEDURE: This water was analyzed according to "Standard Methods for the Examination for Water and Wastewater", 16th Edition, APHA, AWWA, and WPCF (1985).

RESULTS:

<u>SECONDARY ANALYSIS</u>	<u>(MCL)</u>	<u>MW-A</u>	<u>UNITS</u>
Chloride, Cl	(250)	4.2	mg/l
Color, PCU	(15)	<5	PCU
Copper, Cu	(1.0)	<0.01	mg/l
Foaming Agents, (MBAS)	(0.5)	<0.1	mg/l
Iron, Fe	(0.3)	<0.100	mg/l
Manganese, Mn	(0.05)	0.269	mg/l
Sulfate, SO ₄	(250)	<1	mg/l
Zinc, Zn	(5)	<0.05	mg/l
Total Dissolved Solids	(500)	255	mg/l
pH (Laboratory)	(6.5-8.5)	7.5	units
Odor Threshold	(3)	1	units
Corrosivity	(-0.2 to +0.2)	0.4	units

GENERAL WATER ANALYSIS

Phenolphthalein Alkalinity, CaCO ₃	0	mg/l
Total Alkalinity, CaCO ₃	260	mg/l
Carbonate Alkalinity, CaCO ₃	0	mg/l
Bicarbonate Alkalinity, CaCO ₃	260	mg/l
Carbonates, CaCO ₃	0	mg/l
Bicarbonates, HCO ₃	317	mg/l
Hydroxides, as OH	0	mg/l
Carbon Dioxide, CO ₂	10.6	mg/l
Fluoride, F	<0.05	mg/l
Nitrate Nitrogen, NO ₃ -N	<0.03	mg/l
Turbidity, NTU	0.5	NTU
pHs	7.1	units
Stability Index	6.7	units
Total Hardness, CaCO ₃	208	mg/l
Magnesium Hardness, CaCO ₃	20.3	mg/l
Calcium Hardness, CaCO ₃	188	mg/l
Calcium, Ca	755	mg/l
Magnesium, Mg	4.94	mg/l
Specific Conductance, umhos	330	umhos
Hydrogen Sulfide, H ₂ S (F-F)	<0.1	mg/l
Sodium, Na	3.6	mg/l
Total Organic Carbon, TOC	17.3	mg/l
Total Kjeldahl Nitrogen, TKN	0.75	mg/l

MCL - Maximum Contaminant Level.

< = Less Than

Best Available Copy

THORNTON LABORATORIES, INC.

TWX 810 876-9134
THORNT LAB TPA

1145 EAST CASS STREET
TAMPA, FLORIDA 33601 - 2880
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES
HRS #84147 & HRS #E84100

TELEPHONE (813) 223-9702
P.O. BOX 2880

November 4, 1987

Laboratory Number 870780
Sample of Water
Date Received October 28, 1987
For Seaburn and Robertson
P.O. Box 23184
Tampa, Florida 33623
Attention Jay McAllister

Remarks: Project No. 86208. Location: Citrus County Landfill. Sample No. 1. Well No. MW-A. Sampled by TJK on 10/28/87 @ 1215. Water Depth: 99 ft., Field pH: 7.0. Field Temperature: 25.0°C. Field Conductance: 440 umhos/cm. Volume Removed Before Sampling: 109 gallons.

CERTIFICATE OF ANALYSIS

Total Coliform (MF/100c)

<3

Analysis according to "Standard Methods for the Examination of Water & Wastewater" APHA, Latest Edition.

FDHRS LABORATORY ID #84147 and E84100

THORNTON LABORATORIES, INC.

Laure H. Taylor

Seaburn & Robertson
Attn: Jay McAllister

Report: 51133 (4196, 4262)
Page 4 of 8

<u>SECONDARY ANALYSIS</u>	<u>(MCL)</u>	<u>MW-B</u>	<u>UNITS</u>
Chloride, Cl	(250)	5.2	mg/l
Color, PCU	(15)	<5	PCU
Copper, Cu	(1.0)	<0.01	mg/l
Foaming Agents, (MBAS)	(0.5)	<0.1	mg/l
Iron, Fe	(0.3)	<0.100	mg/l
Manganese, Mn	(0.05)	<0.050	mg/l
Sulfate, SO ₄	(250)	<1	mg/l
Zinc, Zn	(5)	0.11	mg/l
Total Dissolved Solids	(500)	22	mg/l
pH (Laboratory)	(6.5-8.5)	6.4	units
Odor Threshold	(3)	1	units
Corrosivity	(-0.2 to +0.2)	-3.6	units

GENERAL WATER ANALYSIS

Phenolphthalein Alkalinity, CaCO ₃	0	mg/l
Total Alkalinity, CaCO ₃	13	mg/l
Carbonate Alkalinity, CaCO ₃	0	mg/l
Bicarbonate Alkalinity, CaCO ₃	13	mg/l
Carbonates, CaCO ₃	0	mg/l
Bicarbonates, HCO ₃	15	mg/l
Hydroxides, as OH	0	mg/l
Carbon Dioxide, CO ₂	10.0	mg/l
Fluoride, F	<0.05	mg/l
Nitrate Nitrogen, NO ₃ -N	0.38	mg/l
Turbidity, NTU	0.5	NTU
pHs	10.0	units
Stability Index	13.6	units
Total Hardness, CaCO ₃	<7.71	mg/l
Magnesium Hardness, CaCO ₃	<4.12	mg/l
Calcium Hardness, CaCO ₃	3.59	mg/l
Calcium, Ca	1.44	mg/l
Magnesium, Mg	<1.00	mg/l
Specific Conductance, umhos	25	umhos
Hydrogen Sulfide, H ₂ S (F-F)	<0.1	mg/l
Sodium, Na	3.8	mg/l
Total Organic Carbon, TOC	7.2	mg/l
Total Kjeldahl Nitrogen, TKN	0.39	mg/l

Best Available Copy

THORNTON LABORATORIES, INC.

TWX 810 876-9134
THORNT LAB TPA

1145 EAST CASS STREET
TAMPA, FLORIDA 33601 - 2880
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES
HRS #84147 & HRS #E84100
November 4, 1987

TELEPHONE (813) 223-9702
P.O. BOX 2880

Laboratory Number: 670733
Sample of: Water
Date Received: October 28, 1987
For: Seaburn and Robertson
P.O. Box 28184
Tampa, Florida 33623
Attention: JAY McAllister

Marks: Project No. 86208, Location: Citrus County Landfill, Sample No. 2, Well No. MW-B, Sampled by TJM on 10/28/87 @ 1130, Water Depth: 105.5 ft., Field pH: 5.0, Field Temperature: 23.0°C, Field Conductance: 30 umhos/cm, Volume Removed Before Sampling: 73 gallons.

CERTIFICATE OF ANALYSIS

Total Coliform (MF/100c)

<3

Analysis according to "Standard Methods for the Examination of Water & Wastewater" APHA, Latest Edition.

FDHRS LABORATORY ID #84147 and E84100

THORNTON LABORATORIES, INC.

Lawrence H. Taylor

Seaburn & Robertson
Attn: Jay McAllister

Report: 51133 (4196, 4262)
Page 5 of 8

<u>SECONDARY ANALYSIS</u>	<u>(MCL)</u>	<u>MW-C</u>	<u>UNITS</u>
Chloride, Cl	(250)	4.2	mg/l
Color, PCU	(15)	5	PCU
Copper, Cu	(1.0)	<0.01	mg/l
Foaming Agents, (MBAS)	(0.5)	<0.1	mg/l
Iron, Fe	(0.3)	<0.100	mg/l
Manganese, Mn	(0.05)	0.265	mg/l
Sulfate, SO ₄	(250)	<1	mg/l
Zinc, Zn	(5)	<0.05	mg/l
Total Dissolved Solids	(500)	325	mg/l
pH (Laboratory)	(6.5-8.5)	7.2	units
Odor Threshold	(3)	1	units
Corrosivity	(-0.2 to +0.2)	0.3	units

GENERAL WATER ANALYSIS

Phenolphthalein Alkalinity, CaCO ₃	0	mg/l
Total Alkalinity, CaCO ₃	275	mg/l
Carbonate Alkalinity, CaCO ₃	0	mg/l
Bicarbonate Alkalinity, CaCO ₃	275	mg/l
Carbonates, CaCO ₃	0	mg/l
Bicarbonates, HCO ₃	336	mg/l
Hydroxides, as OH	0	mg/l
Carbon Dioxide, CO ₂	30.0	mg/l
Fluoride, F	<0.05	mg/l
Nitrate Nitrogen, NO ₃ -N	0.07	mg/l
Turbidity, NTU	0.5	NTU
pHs	6.9	units
Stability Index	6.6	units
Total Hardness, CaCO ₃	298	mg/l
Magnesium Hardness, CaCO ₃	21.8	mg/l
Calcium Hardness, CaCO ₃	276	mg/l
Calcium, Ca	111	mg/l
Magnesium, Mg	5.29	mg/l
Specific Conductance, umhos	410	umhos
Hydrogen Sulfide, H ₂ S (F-F)	<0.1	mg/l
Sodium, Na	2.6	mg/l
Total Organic Carbon, TOC	15.2	mg/l
Total Kjeldahl Nitrogen, TKN	0.28	mg/l

BEST AVAILABLE COPY

THORNTON LABORATORIES, INC.

TWX 810 876-9134
THORNT LAE TPA

1145 EAST CASS STREET
TAMPA, FLORIDA 33601 - 2860
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES
HRS #84147 & HRS #E84100
November 4, 1987

TELEPHONE (813) 223-9702
P.O. BOX 2860

Laboratory Number 670734
Sample of Water
Date Received October 28, 1987
For Esbunn and Robertson,
P.O. Box 23184
Tampa, Florida 33623
Attention Jay McAllister

Remarks: Project No. E620E-001. Location: Citrus County Landfill. Sample No. 3.
Well No. MW-C, Sampled by TJM/KCS on 10/28/87 @ 1320, Water Depth:
105 ft.

CERTIFICATE OF ANALYSIS

Total Coliform (MF/100c)

<3

Analysis according to "Standard Methods for the Examination of Water & Wastewater"
APHA, Latest Edition.

FDHRS LABORATORY ID #84147 and E84100

THORNTON LABORATORIES, INC.

Laure H. Taylor

Seaburn & Robertson
Attn: Jay McAllister

Report: 51133 (4196, 4262)
Page 6 of 8

<u>SECONDARY ANALYSIS</u>	<u>(MCL)</u>	<u>MW-D</u>	<u>UNITS</u>
Chloride, Cl	(250)	7.1	mg/l
Color, PCU	(15)	5	PCU
Copper, Cu	(1.0)	<0.01	mg/l
Foaming Agents, (MBAS)	(0.5)	<0.1	mg/l
Iron, Fe	(0.3)	0.171	mg/l
Manganese, Mn	(0.05)	1.71	mg/l
Sulfate, SO ₄	(250)	<1	mg/l
Zinc, Zn	(5)	0.14	mg/l
Total Dissolved Solids	(500)	355	mg/l
pH (Laboratory)	(6.5-8.5)	7.4	units
Odor Threshold	(3)	1	units
Corrosivity	(-0.2 to +0.2)	0.6	units

GENERAL WATER ANALYSIS

Phenolphthalein Alkalinity, CaCO ₃	0	mg/l
Total Alkalinity, CaCO ₃	321	mg/l
Carbonate Alkalinity, CaCO ₃	0	mg/l
Bicarbonate Alkalinity, CaCO ₃	321	mg/l
Carbonates, CaCO ₃	0	mg/l
Bicarbonates, HCO ₃	391	mg/l
Hydroxides, as OH	0	mg/l
Carbon Dioxide, CO ₂	24.0	mg/l
Fluoride, F	<0.05	mg/l
Nitrate Nitrogen, NO ₃ -N	<0.03	mg/l
Turbidity, NTU	0.4	NTU
pHs	6.8	units
Stability Index	6.2	units
Total Hardness, CaCO ₃	287	mg/l
Magnesium Hardness, CaCO ₃	21.7	mg/l
Calcium Hardness, CaCO ₃	265	mg/l
Calcium, Ca	106	mg/l
Magnesium, Mg	5.27	mg/l
Specific Conductance, umhos	450	umhos
Hydrogen Sulfide, H ₂ S (F-F)	<0.1	mg/l
Sodium, Na	4.6	mg/l
Total Organic Carbon, TOC	23.4	mg/l
Total Kjeldahl Nitrogen, TKN	0.51	mg/l

Best Available Copy

THORNTON LABORATORIES, INC.

TWX 810 876-9134
THORNT LAB TPA

1145 EAST CASS STREET
TAMPA, FLORIDA 33601 - 2860
MARINE, ANALYTICAL AND ENVIRONMENTAL SERVICES
HRS #84147 & HRS #E84100
NO. 2860

TELEPHONE (813) 223-9702
P.O. BOX 2860

Laboratory Number 670733
Sample of Water
Date Received October 28, 1997
For Seaburn and Robertson
F.O. Box 23184
Tampa, Florida 33623
Attention: Jay McAllister

Marks: Project No. 86206-001. Location: Citrus County Landfill. Sample No. 4.
Well No. NW-D, Sampled by TJN/KCS on 10/28/97 @ 1010; Water Depth:
103.5 ft., Field pH: 6.80, Field Temperature: 24°C, Field Conductance:
600 umhos/cm, Volume Removed Before Sampling: 300 gallons.

CERTIFICATE OF ANALYSIS

Total Coliform (MF/100c)

<3

Analysis according to "Standard Methods for the Examination of Water & Wastewater"
APHA, Latest Edition.

FDHRS LABORATORY ID #84147 and E84100

THORNTON LABORATORIES, INC.

Laura H. Taylor

Seaburn & Robertson
Attn: Jay McAllister

Report #: 51133 (4196, 4262)
Page 7 of 8

QUALITY CONTROL DATA SHEET

DUPLICATES:

PARAMETER	% DIFFERENCE	DATE	ANALYST
Chloride	5.0	11-13-87	R.P.
MBAS	<1.0	11-12-87	K.C.
Sulfate	1.8	11-12-87	E.P.
Total Dissolved Solids	2.9	11-17-87	B.D.
pH	<1.0	11-12-87	P.S.
Odor	<1.0	11-18-87	B.D.
Total Alkalinity	<1.0	11-12-87	P.S.
Fluoride	3.0	11-19-87	C.L.
Hydrogen Sulfide	<1.0	11-18-87	B.D.
Nitrates	14.3	11-12-87	C.L.
Sodium	<1.0	11-23-87	C.L.
Specific Conductance	<1.0	11-16-87	B.D.
Total Kjeldahl Nitrogen	6.6	11-18-87	C.L.
Total Organic Carbon	<1.0	11-23-87	K.C.
Calcium	1.3	11-17-87	M.S.
Magnesium	<1.0	11-17-87	M.S.
Iron	<1.0	11-23-87	M.S.
Manganese	<1.0	11-20-87	M.S.
Copper	1.0	11-18-87	C.G.
Zinc	<1.0	11-16-87	C.G.
Ethylene Dibromide	0.1	11-16-87	B.V.
Ethylene Dibromide	7.6	11-16-87	B.V.
Ethylene Dibromide	3.1	11-16-87	B.V.

Seaburn & Robertson
Attn: Jay McAllister

Report #: 51133 (4196, 4262)
Page 8 of 8

QUALITY CONTROL DATA SHEET

SPIKES:

PARAMETER	% RECOVERY	DATE	ANALYST
Chloride	99.9	11-13-87	R.P.
MBAS	100	11-12-87	K.C.
Sulfate	91	11-12-87	E.P.
Total Alkalinity	91.0	11-12-87	P.S.
Fluoride	104	11-19-87	C.L.
Hydrogen Sulfide	120	11-18-87	B.D.
Nitrates	98.1	11-12-87	C.L.
Sodium	100	11-23-87	C.L.
Total Kjeldahl Nitrogen	90.3	11-18-87	C.L.
Total Organic Carbon	98.4	11-23-87	K.C.
Calcium	102	11-17-87	M.S.
Magnesium	102	11-17-87	M.S.
Iron	100	11-23-87	M.S.
Manganese	101	11-20-87	M.S.
Copper	95	11-18-87	C.G.
Zinc	97	11-16-87	C.G.
Ethylene Dibromide	98/98	11-16-87	B.V.
Ethylene Dibromide	94/102	11-16-87	B.V.
Ethylene Dibromide	95/92	11-16-87	B.V.

APPENDIX B

PARAMETER MONITORING REPORT
(Rule 17-3.402, 17-3.404 - 17-3.406)

GMS # 4009C00086

Sample Date 10/28/87

Monitoring Well # MW-A

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater G-2, Floridan

Well Developed* Prior to Sample Collection (Yes/No) yes

Ground Water Elevation (above MSL) 5.92 f

STORE# Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Preser- vatives Added
00942	Chloride	Grab	S.M. 407.A	4.2	mg/l	Unfiltered	None
00081	Color	Grab	S.M. 204.A	<5.0	PCU	Unfiltered	None
01042	Copper	Grab	EPA 220.1	<0.01	mg/l	Unfiltered	None
---	Corrosivity	Grab	Calculation	0.4	Units	Unfiltered	None
38260	MBAS	Grab	EPA 425.1	<0.1	mg/l	Unfiltered	None
01045	Iron	Grab	EPA 200.7	<0.100	mg/l	Unfiltered	None
01055	Manganese	Grab	EPA 243.1	0.269	mg/l	Unfiltered	None
00945	Sulfate	Grab	EPA 375.4	<1.0	mg/l	Unfiltered	None
00530	TDS	Grab	EPA 160.2	255.0	mg/l	Unfiltered	None
01092	Zinc	Grab	EPA 289.1	<0.05	mg/l	Unfiltered	None
00403	pH (Lab)	Grab	EPA 150.1	7.5	pH Unit	Unfiltered	None
00085	Odor	Grab	EPA 140.1	1.0	TON	Unfiltered	None
00630	Nitrate-N	Grab	EPA 353.2	<0.03	mg/l	Unfiltered	H ₂ SO ₄
00625	TKN	Grab	EPA 351.2	0.75	mg/l	Unfiltered	None
00095	Spec. Cond.	Grab	EPA 120.1	330.0	umhos/cm	Unfiltered	None
00929	Sodium	Grab	S.M. 325.B	3.6	mg/l	Unfiltered	HNO ₃
00680	TOC	Grab	EPA 415.1	17.3	mg/l	Unfiltered	H ₂ SO ₄
00076	Turbidity	Grab	EPA 180.1	0.5	NTU	Unfiltered	None
31502	T. Coliform	Grab	S.M. 909.A	<3.0	MPN/100c	Unfiltered	None

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. ora 17-1.216(2)
 Effective January 1, 1983

*All samples cooled to 4°C.

PARAMETER MONITORING REPORT
(Rule 17-3.402, 17-3.404 - 17-3.406)

WCS # 4009C00086

Sample Date 10/28/87

Monitoring Well # MV-A

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater Floridan Aquifer G-2

Well Developed* Prior to Sample Collection (Yes/No) yes

Ground Water Elevation (above MSL) 5.92 ft

STORE # Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Preservatives Added
39180	Trichloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34475	Tetrachloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
32102	Carbon Tetrachloride	Grab	EPA 264	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
39175	Vinyl Chloride	Grab	EPA 624	0.004	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34506	1,1,1-Trichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34531	1,2-Dichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34010	Benzene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
77651	Ethylene Dibromide	Grab	HRS 501.2	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. ora 17-1.216(2)
 (Effective January 1, 1983)

*All samples cooled to 4°C

PARAMETER MONITORING REPORT
(Rule 17-3.402, 17-3.404 - 17-3.406)

GMS # 4009C00086

Sample Date 10/28/87

Monitoring Well # MW-B

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater G-2, Floridan

Well Developed* Prior to Sample Collection (Yes/No) yes

Ground Water Elevation (above MSL) 6.91 ft

STORET Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Preservatives Added
00942	Chloride	Grab	S.M. 407.A	5.2	mg/l	Unfiltered	None
00081	Color	Grab	S.M. 204.A	<5.0	PCU	Unfiltered	None
01042	Copper	Grab	EPA 220.1	<0.01	mg/l	Unfiltered	None
---	Corrosivity	Grab	Calculation	-3.6	Units	Unfiltered	None
38260	MEAS	Grab	EPA 425.1	<0.1	mg/l	Unfiltered	None
01045	Iron	Grab	EPA 200.7	<0.100	mg/l	Unfiltered	None
01055	Manganese	Grab	EPA 243.1	<0.050	mg/l	Unfiltered	None
00945	Sulfate	Grab	EPA 375.4	<1.0	mg/l	Unfiltered	None
00530	TDS	Grab	EPA 160.2	22.0	mg/l	Unfiltered	None
01092	Zinc	Grab	EPA 289.1	0.11	mg/l	Unfiltered	None
00403	pH (Lab)	Grab	EPA 150.1	6.4	pH Unit	Unfiltered	None
00085	Odor	Grab	EPA 140.1	1.0	TON	Unfiltered	None
00630	Nitrate-N	Grab	EPA 353.2	0.38	mg/l	Unfiltered	H ₂ SO ₄
00625	TKN	Grab	EPA 351.2	0.39	mg/l	Unfiltered	None
00095	Spec. Cond.	Grab	EPA 120.1	25.0	umhos/cm	Unfiltered	None
00929	Sodium	Grab	S.M. 325.B	3.8	mg/l	Unfiltered	HNO ₃
00680	TOC	Grab	EPA 415.1	7.2	mg/l	Unfiltered	H ₂ SO ₄
00076	Turbidity	Grab	EPA 180.1	0.5	NTU	Unfiltered	None
31502	T. Coliform	Grab	S.M. 909.A	<3.0	MPN/100c	Unfiltered	None

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. ors 17-1.216(2)
(Effective January 1, 198)

*All samples cooled to 4°C.

PARAMETER MONITORING REPORT
(Rule 17-3.402, 17-3.404 - 17-3.406)

GMS # 4009C00086

Sample Date 11/5/87

Monitoring Well # MW-B

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater Florida Aquifer G-2

Well Developed* Prior to Sample Collection (Yes/No) YES

Ground Water Elevation (above MSL) 6.91

STORE# Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Precipitates Added
39180	Trichloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34475	Tetrachloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
32102	Carbon Tetrachloride	Grab	EPA 264	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
39175	Vinyl Chloride	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34506	1,1,1-Trichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34531	1,2-Dichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34010	Benzene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
77651	Ethylene Dibromide	Grab	HRS 501.2	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. ora 17-1.216(2)
 (Effective January 1, 1983)

*All samples cooled to 4°C

PARAMETER MONITORING REPORT
(Nule 17-3.602, 17-3.604 - 17-3.606)

GMS # 4009C00086

Sample Date 10/28/87

Monitoring Well # MW-C

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Classification of Groundwater G-2, Floridan

Well Developed* Prior to Sample Collection (Yes/No) Yes

Ground Water Elevation (above MSL) 6.05

STORE Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Preservatives Added
00942	Chloride	Grab	S.M. 407.A	4.2	mg/l	Unfiltered	None
00081	Color	Grab	S.M. 204.A	5.0	PCU	Unfiltered	None
01042	Copper	Grab	EPA 220.1	<0.01	mg/l	Unfiltered	None
---	Corrosivity	Grab	Calculation	0.3	Units	Unfiltered	None
38260	MBAS	Grab	EPA 425.1	<0.1	mg/l	Unfiltered	None
01045	Iron	Grab	EPA 200.7	<0.100	mg/l	Unfiltered	None
01055	Manganese	Grab	EPA 243.1	0.265	mg/l	Unfiltered	None
00945	Sulfate	Grab	EPA 375.4	<1.0	mg/l	Unfiltered	None
00530	TDS	Grab	EPA 160.2	325.0	mg/l	Unfiltered	None
01092	Zinc	Grab	EPA 289.1	<0.05	mg/l	Unfiltered	None
00403	pH (Lab)	Grab	EPA 150.1	7.2	pH Unit	Unfiltered	None
00085	Odor	Grab	EPA 140.1	1.0	TON	Unfiltered	None
00030	Nitrate-N	Grab	EPA 353.2	0.07	mg/l	Unfiltered	H ₂ SO ₄
00025	TKN	Grab	EPA 351.2	0.28	mg/l	Unfiltered	None
00095	Spec. Cond.	Grab	EPA 120.1	410.0	umhos/cm	Unfiltered	None
00929	Sodium	Grab	S.M. 325.B	2.6	mg/l	Unfiltered	HNO ₃
00080	TOC	Grab	EPA 415.1	15.2	mg/l	Unfiltered	H ₂ SO ₄
00076	Turbidity	Grab	EPA 180.1	0.5	NTU	Unfiltered	None
31502	T. Coliform	Grab	S.M. 909.A	<3.0	MPN/100c	Unfiltered	None

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DC. ora 17-1.216(2)
 Effective January 1, 198)

*All samples cooled to 4°C.

PARAMETER MONITORING REPORT
(Rule 17-3.402, 17-3.404 - 17-3.406)

GWS # 4009C00086

Sample Date 11/5/87

Monitoring Well # MW-C

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater Floridan Aquifer G-2

Well Developed* Prior to Sample Collection (Yes/No) yes

Ground Water Elevation (above MSL) 6.05

STORML Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Precipitates Added
39180	Trichloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34475	Tetrachloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
32102	Carbon Tetrachloride	Grab	EPA 264	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
39175	Vinyl Chloride	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34506	1,1,1-Trichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34531	1,2-Dichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34010	Benzene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
77651	Ethylene Dibromide	Grab	HRS 501.2	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DC. ora 17-1.216(2)
(effective January 1, 1983)

*All samples cooled to 4°C

PARAMETER MONITORING REPORT
(Nule 17-3.602, 17-3.604 - 17-3.606)

GMS # 4009C00086

Sample Date _____

Monitoring Well # MW-D

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater C-2, Floridan

Well Developed* Prior to Sample Collection (Yes/no) yes

Ground Water Elevation (above MSL) 5.99

STORET Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample filtered/Unfiltered	Preservatives Added
00942	Chloride	Grab	S.M. 407.A	7.1	mg/l	Unfiltered	None
00081	Color	Grab	S.M. 204.A	5.0	PCU	Unfiltered	None
01042	Copper	Grab	EPA 220.1	<0.01	mg/l	Unfiltered	None
---	Corrosivity	Grab	Calculation	0.6	Units	Unfiltered	None
38260	MSAS	Grab	EPA 425.1	<0.1	mg/l	Unfiltered	None
01045	Iron	Grab	EPA 200.7	0.171	mg/l	Unfiltered	None
01055	Manganese	Grab	EPA 243.1	1.71	mg/l	Unfiltered	None
00945	Sulfate	Grab	EPA 375.4	<1.0	mg/l	Unfiltered	None
00530	TDS	Grab	EPA 160.2	355.0	mg/l	Unfiltered	None
01092	Zinc	Grab	EPA 289.1	0.14	mg/l	Unfiltered	None
00403	pH (Lab)	Grab	EPA 150.1	7.4	pH Unit	Unfiltered	None
00085	Odor	Grab	EPA 140.1	1.0	TON	Unfiltered	None
00630	Nitrate-N	Grab	EPA 353.2	<0.03	mg/l	Unfiltered	H ₂ SO ₄
00625	TKN	Grab	EPA 351.2	0.51	mg/l	Unfiltered	None
00095	Spec. Cond.	Grab	EPA 120.1	450.0	umhos/cm	Unfiltered	None
00929	Sodium	Grab	S.M. 325.B	4.6	mg/l	Unfiltered	HNO ₃
00680	TOC	Grab	EPA 415.1	23.4	mg/l	Unfiltered	H ₂ SO ₄
00076	Turbidity	Grab	EPA 180.1	0.4	NTU	Unfiltered	None
31502	T. Coliform	Grab	S.M. 909.A	<3.0	MPN/100c	Unfiltered	None

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. ora 17-1.216(2)
 (Effective January 1, 198)

*All samples cooled to 4°C.

PARAMETER MONITORING REPORT
(Rule 17-3.002, 17-3.004 - 17-3.006)

WWS # 4009C00086

Sample Date 11/5/87

Monitoring Well # MW-D

Well Type: Background
 Site Boundary
 Intermediate
 Compliance

Well Name _____

Classification of Groundwater Floridan Aquifer G-2

Well Developed* Prior to Sample Collection (Yes/No) yes

Ground Water Elevation (above MSL) 5.99

STOWE Code	Parameter Monitored	Sampling Method	Analysis Method	Analysis Result	Units	Sample Filtered/Unfiltered	Preservatives Added
39180	Trichloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34475	Tetrachloroethene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
32102	Carbon Tetrachloride	Grab	EPA 264	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
39175	Vinyl Chloride	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34506	1,1,1-Trichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34531	1,2-Dichloroethane	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
34010	Benzene	Grab	EPA 624	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6
77651	Ethylene Dibromide	Grab	HRS 501.2	ND(0.001)	mg/l	Unfiltered	Na ₂ S ₂ O ₃ 6

*Well development is the process of pumping the well prior to sampling in order to obtain representative ground water sample.

DE. are 17-1.216(2)
(Effective January 1, 1983)

*All samples cooled to 4°C