CDM

City of Clewiston, Florida

Water Treatment Plant Injection Well System Request for Operational Testing

FDEP Permit No. 249635-001-UC

July 2007

6365 N.W. 6th Way, Suite 200
Fort Lauderdale, Florida 33309
tel: 954 776-1731
fax: 954 928-1649

July 9, 2007

Mr. David Rhodes, P.G.
Water Facilities
Florida Department of Environmental Protection
South District
2295 South Victoria Avenue
Fort Myers, Florida 33901

Subject: City of Clewiston Water Treatment Plant
Concentrate Injection Well System
Request to Commence Operational Testing
FDEP File No. 249635-001-UC

Dear Mr. Rhodes:

On behalf of the City of Clewiston, it is requested that the Underground Injection Control Technical Advisory Committee (TAC) authorize the commencement of operational testing for the above referenced facility. The basis for this request is that the City has completed the criteria to commence operational testing as required in Specific Conditions 6. a., b., and c. of the Construction Permit. The supporting data listed in these conditions has either been submitted previously or is included as an attachment to this letter. Table 1, which is attached, provides a summary as to the submittal status of the data supporting this request.

Based on the submittals, it is believed that the injection well system has satisfied the requirements to begin operational testing, with the exception of field verification by the TAC. The timely review and approval of this submittal would be appreciated as the City is scheduled to start operations by August 30, 2007. Your office will be contacted in the near future to schedule a site visit so that the facilities may be inspected. In the interim, if there are any questions or if additional information is needed, please contact our office.

Very truly yours,

Stewart J. Magenheimer, P.G.
Camp Dresser & McKee Inc.

SJM/
Attachments

File No. 27335 45307 002.DIW-[9]

c: Kevin McCarthy, City of Clewiston
Steve Anderson, SFWMD
Joe Haberfeld, FDEP-Tal
Ron Reese, USGS

TABLE 1
City of Clewiston
Concentrate Injection Well System
Summary of Construction Related Submittals Through 7/9/07

Permit Item Reference	Description	Status
6.a.	Notice of completion of construction	Enclosed
6.b.	Short term injection test	Completed on 11/10/06
6.c.(1)	Copy of borehole television survey 975 to 2,100 feet bpl 2,100 to 3,500 feet bpl	 Submitted in letter dated 5/18/06 Submitted in letter dated 7/10/06
6.c.(2)	Geophy. logs 0-253 feet bpl Geophy. logs 250 – 1,000 feet bpl Geophy. logs 1,000 – 2,100 feet bpl Geophy. logs 2,100 – 3,505 feet bpl Cement Bond and Stage Logs	Submitted in Weekly Rpt. 4/14/06 Submitted in Weekly Rpt. 4/21/06 Submitted in letter dated 5/18/06 Submitted in letter dated 7/10/06 Submitted in Weekly Rpt. 8/18/06
6.c.(3)	Mechanical integrity test data	Submitted in letter dated 11/6/06
6.c.(4)	Short term injection test data	Enclosed with analysis
6.c.(5)	Confining zone data	Submitted in letter dated 7/10/06; geotechnical analysis of core plugs enclosed
6.c.(6)	Background water quality data for injection and monitor zones	Enclosed
6.c.(7)	Wastestream analysis	Unavailable until plant starts operations; estimate submitted in injection well construction permit application
6.c.(8)	As-built well construction specifications	Record drawings submitted as part of draft O&M manual (enclosed)
6.c.(9)	Draft operations & maintenance manual with emergency procedures	Enclosed
6.c.(10)	Other data	Well Completion Report subsequent submittal

Permit Item Reference 6.a.
Notice of Completion of Construction

McCafferty Brinson Consulting, LLC

4050 West Broward Boulevard
Plantation, Florida 33317
Telephone: (954) 797.7100

Florida License No. 26952
www.mbconsulting.us

July 3, 2007

Mr. David Rhodes, P.G.
Water Facilities
Florida Department of Environmental Protection
South District
2295 South Victoria Avenue
Fort Myers, Florida 33901

Subject: City of Clewiston Water Treatment Plant
Concentrate Injection Well System
Completion of Construction Certification
FDEP File No. 249635-001-UC

Dear Mr. Rhodes:

The purpose of this letter is to provide a completion of construction certification for Injection Well IW-1, Dual Zone Monitor Well DZMW-1, and the associated surface equipment for the above referenced facility. The City of Clewiston's concentrate injection well system was constructed in accordance with the UIC construction permit and the approved engineering plans and specifications, or that to the best of my knowledge and belief, any deviations from the construction permit and approved engineering plans and specifications will not prevent this facility from functioning in compliance with Chapter 62-528 of the Florida Administrative Code. This certification is based upon on-site project observation of construction conducted by me or by a project representative under my direct supervision, and if applicable, upon review of shop drawings, test results/records, and record drawings performed by me or by a project representative under my direct supervision.

Very truly yours,

7/3/07

Frank A. Brinson, P.E.
Vice President
Florida P.E. No. 51313
McCafferty Brinson Consulting, LLC

File No. 27335 45307 002.DIW-[1]

c. Kevin McCarthy, Clewiston

Permit Item Reference 6.c.(4)
Short Term Injection Test Data

Injection Test

A constant rate injection test was performed on injection well IW-1 in order to evaluate the hydraulic characteristics of the well and the injection zone. During a constant rate injection test, the system is tested by pumping fluid at a rate equal to or greater than the expected maximum and permitted operating rate. The pumping rate is maintained as constant as feasibly possible throughout the injection phase of the test.

Prior to the start of the test, data control points were established to monitor the effects of injection on the injection well and the dual-zone monitor well zones. These control points included wellhead pressure and pressure (head) in both monitor zones. The control points and monitoring methods are summarized in **Table 1**.

Table 1: Injection test control points

Control point/ monitored zone	Parameters monitored	Collection methods
Injection well IW-1 wellhead	Pressure	Pressure gauge & Pressure transducer
Monitor well, upper zone	Pressure	Pressure transducer
Monitor well, lower zone	Pressure	Pressure transducer
Barometric data	Atmospheric pressure	Pressure transducer
Flowmeter	Injection rate and total flow	Flowmeter (manually read)

Injection test procedures

The IW-1 injection test consisted of three phases: a background data collection phase, an injection phase, and a recovery phase. The background data collection phase was started on Tuesday, November 7, 2006. From 1100 hours to 1234 hours on Wednesday, November 8, 2006, a preliminary injection test was performed to determine operating pressures and pumping rates. The background data collection proceeded for an additional 27 hours following cessation of the preliminary injection test.

The injection phase was performed on Thursday, November 9, 2006, starting at 1600 hours and lasted for approximately 12 hours. Reclaimed water from on-site storage ponds was injected using a temporary pump station and piping to the injection well. The effluent is disinfected with chlorine via an inline injector pump prior to discharge to the retention ponds. The average flow rate during the 12 hour injection period was approximately 2,850 gpm (4.10 Mgd). The recovery phase began immediately after the completion of the injection test and continued through the morning of Sunday, November 11, 2006.

Injection test results

A plot of the injection test data is included and The injection phase results are summarized in **Table 2**.

The background (static) wellhead pressure in injection well IW-1 ranged from 23 to 24 psi. Wellhead pressure, as measured on the wellhead pressure gauge, increased to approximately 58 psi during injection at 4.16 mgd, an increase of approximately 34 psi. Bottom hole pressure increased by approximately 23 psi. The difference between the increase in wellhead and bottom hole pressures are due to head losses within the injection well casing. No changes in pressures related to injection were detected in either the upper or lower zones of the dual-zone monitor well.

Table 2: Summary of injection test results (manual readings)

Time (11/9/06-11/10/06)	Elapsed time Since start of injection (hours)	Elapsed time since start of monitoring (hours)	IW-1 Wellhead pressure (psi)	Injection rate (Mgd)
1620	0	49.32	Start of injection	
1630	0.17	49.49	57.5	4.2
1700	0.67	49.99	57.5	4.2
1720	1.00	50.32	57.5	4.2
1820	2.00	51.32	57.5	4.1
1900	2.67	51.99	57.5	4.1
2000	3.67	52.99	58.0	4.1
2100	4.67	53.99	58.0	4.1
2200	5.67	54.99	58.0	4.1
2300	6.67	55.99	58.0	4.1
0000	7.67	56.99	58.0	4.1
0100	8.67	57.99	58.5	4.1
0200	9.67	58.99	58.5	4.1
0300	10.67	59.99	58.5	4.1
0400	11.67	60.99	58.5	4.1
0420	12.00	61.32	58.5	4.1
0430	12.17	61.49	58.5	4.1
0433	12.22	61.54	Stopped injection	

Injection test conclusions

The injection test results indicate that injection well IW-1 can efficiently accept its design capacity of flow of 4.1 mgd. The increase in wellhead pressure at an average injection rate of 4.16 mgd was 34 psi and the maximum increase in bottom-hole pressure was 29 psi.

The specific capacity of injection well IW-1, using the bottom hole pressure increase, is approximately 100 gpm/ft. The transmissivity of a confined aquifer can be estimated as 2000 times the specific injectivity (or specific capacity; Driscoll, 1986), which would give a value of 2.0×10^4 gpd/ft.

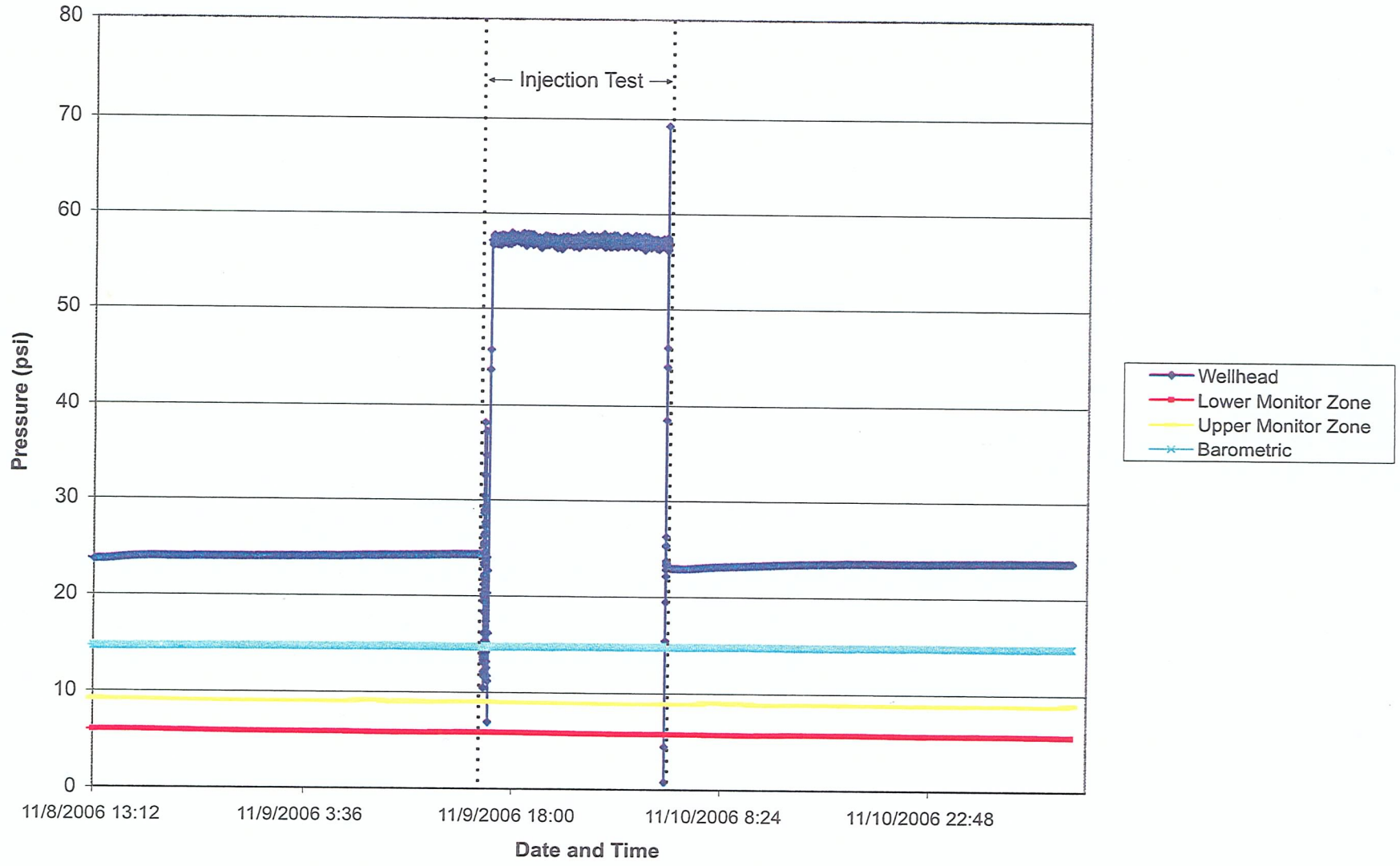

Figure N-1
Clewiston WTP Injection Well System
Injection Test

CDM

BLUE
RIBBON

Blue Ribbon Sales & Services
1940 Howell Branch Rd.
Winter Park, FL 32792

Phone: (877) 677-8899
Fax: (407) 657-6622
www.blueribboncorp.com

CALIBRATION CERTIFICATE
05/23/06

Youngquist Brothers, Inc
15465 Pine Ridge Rd.
Fort Myers, FL 33908

P.O. 19779

S/N: 040305-1

This certificate will certify that your gauge authorized for calibration on your Purchase Order 19779, tested this date, and is in calibration. The gauge tested is identified as a 6", McDaniels gauge 0-200 psi.

This gauge was tested on a Mansfield & Green Deadweight Tester model T-100 Serial Number 11353, certified by QUALITY SYSTEMS LAB, INC., on August 11, 2005 to be accurate to within +/-.25%, traceable to NIST standards.

The subject gauge performed to within +/-1.5% accuracy.

Sincerely,

Juan Nova

FINAL PRESSURE TEST RESULTS

WELL: IW-1 | PROJECT NO.: 27335-45307 | PAGE: 1 0f 1

SITE LOCATION: Clewiston | PERMIT NO.: 249635-001-UC | DATE: 8/21/06 (Day)

CASING SIZE: 16" OD x 0.50" wall | RECORDED BY: D. Legett

CASING DEPTH: 2749 ft. bpl | WITNESSED BY (FDEP): Doug Wells

PACKER DEPTH: 2726 ft. bpl

TIME (HOURS)	ELAPSED TIME (MINUTES)	CASING PRESSURE (PSI)	PRESSURE CHANGE (PSI)	CUMULATIVE PERCENT PRESSURE CHANGE (%)
0940	0	158.1		
0945	5	158.1	0.0	0.00
0950	10	158.0	0.1	0.06
0955	15	158.0	0.0	0.06
1000	20	158.0	0.0	0.06
1005	25	157.8	0.2	0.19
1010	30	157.6	0.2	0.32
1015	35	157.6	0.0	0.32
1020	40	157.4	0.2	0.44
1025	45	157.3	0.1	0.51
1030	50	157.1	0.2	0.63
1035	55	157.0	0.1	0.70
1040	60	156.8	0.2	0.82
	Total pressure change =		1.3 psi	

Witness signatures:

See original handwritten form for signature of Doug Well, FDEP-Ft. Myers

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TRIAL PRESSURE TEST RESULTS

WELL: IW-1 | PROJECT NO.: 27335-45307 | PAGE: 1 0f 1

SITE LOCATION: Clewiston | PERMIT NO.: 249635-001-UC | DATE: 8/21/06 (Day)

CASING SIZE: 16" OD x 0.50" wall | RECORDED BY: D. Legett

CASING DEPTH: 2749 ft. bpl | WITNESSED BY (FDEP): Doug Wells

PACKER DEPTH: 2726 ft. bpl

TIME (HOURS)	ELAPSED TIME (MINUTES)	CASING PRESSURE (PSI)	PRESSURE CHANGE (PSI)	CUMULATIVE PERCENT PRESSURE CHANGE (%)
0940	0	158.1		
0945	5	158.1	0.0	0.00
0950	10	158.0	0.1	0.06
0955	15	158.0	0.0	0.06
1000	20	158.0	0.0	0.06
1005	25	157.8	0.2	0.19
1010	30	157.6	0.2	0.32
1015	35	157.6	0.0	0.32
1020	40	157.4	0.2	0.44
1025	45	157.3	0.1	0.51
1030	50	157.1	0.2	0.63
1035	55	157.0	0.1	0.70
1040	60	156.8	0.2	0.82
	Total pressure change =		1.3 psi	

Witness signatures:

Wal Dlk FDEP

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PRESSURE TEST RESULTS
16-inch Casing / 11.7-inch Fiberglass Tubing Annulus

WELL: IW-1 **PROJECT NO:** 27335-45307 **PAGE:** 1 of 1

SITE: Clewiston **PERMIT NO:** 249635-001-UC **DATE:** 09/01/06

RECORDED BY: AMM

16" CASING DEPTH: 2749 ft bpl **WITNESSED BY:** Alyssa Mork

11.7" F/G DEPTH: 2742 ft bpl

DATE AND TIME	ELAPSED TIME (MINS)	CASING PRESSURE (PSI)	PRESSURE CHANGE	
			PSI	% CHANGE
9/01/06 0935	0.0	153.0	0.0	0.0
0940	5.0	153.0	0.0	0.0
0945	10.0	153.0	0.0	0.0
0950	15.0	153.0	0.0	0.0
0955	20.0	153.0	0.0	0.0
1000	25.0	153.0	0.0	0.0
1005	30.0	153.0	0.0	0.0
1010	35.0	153.0	0.0	0.0
1015	40.0	153.0	0.0	0.0
1020	45.0	153.0	0.0	0.0
1025	50.0	153.0	0.0	0.0
1030	55.0	153.0	0.0	0.0
1035	60.0	153.0	0.0	0.0

Witness Signatures:

(see handwritten form for signature)

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PRESSURE TEST RESULTS
16-inch Casing / 11.7inch Fiberglass Tubing Annulus

WELL: IW-1 **PROJECT NO: 27335-45307** **PAGE: 1 of 1**
SITE: Clewiston **PERMIT NO: 249635-001-UC** **DATE: 9/1/06**

~~CASING SIZE:~~
RECORDED BY: AMM
16" CASING DEPTH: 2749 ft bpl
WITNESSED BY: Alyssa Mork
F/G TUBING DEPTH: 2742 ft bpl

DATE AND TIME	ELAPSED TIME (MINS)	CASING PRESSURE (PSI)	PRESSURE CHANGE	
			PSI	% CHANGE
9/1/06 0935	0.0	153.0	—	—
0940	5.0	153.0	0.0	0
0945	10.0	153.0	0.0	0
0950	15.0	153.0	0.0	0
0955	20.0	153.0	0.0	0
1000	25.0	153.0	0.0	0
1005	30.0	153.0	0.0	0
1010	35.0	153.0	0.0	0
1015	40.0	153.0	0.0	0
1020	45.0	153.0	0.0	0
1025	50.0	153.0	0.0	0
1030	55.0	153.0	0.0	0
1035	60.0	153.0	0.0	0

Witness Signatures:

Alyssa Mork

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FINAL PRESSURE TEST RESULTS

WELL: DZMW-1 | PROJECT NO.: 27335-45307 | PAGE: 1 of 1

SITE LOCATION: Clewiston | PERMIT NO.: 249635-001-UC | DATE: 10/23/06 (Day)

CASING SIZE: 12" OD x 0.375" wall | RECORDED BY: J. Prewitt

CASING DEPTH: 1950 ft. bpl | WITNESSED BY (FDEP): Alyssa Mork

PACKER DEPTH: 1930 ft. bpl

TIME (HOURS)	ELAPSED TIME (MINUTES)	CASING PRESSURE (PSI)	PRESSURE CHANGE (PSI)	CUMULATIVE PERCENT PRESSURE CHANGE (%)
1340	0	68.0		
1355	15	68.0	0.0	0.00
1410	30	68.0	0.0	0.00
1420	40	68.0	0.0	0.00
1430	50	68.0	0.0	0.00
1440	60	68.0	0.0	0.00
		Total pressure change =	0.0 psi	

Witness signatures:

See daily log form for signature of Alyssa Mork, FDEP-Ft. Myers

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DAILY LOG

WEEK NO.: ENDING DATE:

WELL: IW-1 PROJECT NO.: 27335-45307 PAGE: 1

SITE LOCATION: Clewiston PERMIT NO.: 249635-001-UC CONTRACTOR: YOUNGQUIST

PREPARED BY: JMP DATE: 10/23/06 Day HOURS: 0700 - 1900

DATE/TIME	DESCRIPTION OF ACTIVITIES
10/23/06 0700	JMP On Site, Welder arrived on site
	Status: Pipe and packer in hole. Welding top on
0950	Packer Installed 520 psi set at 1936 ft. bgs.
10:29	Start pressure test 66.25 psi
10:59	pressure test - 66.75 psi FDEP contacted - ETA 13:00 pm
11:14	pressure test - 67.0 psi
11:29	pressure test - 67.25 psi 1.5% change over 1 hr.
11:59	pressure test 68.0 psi
12:14	pressure test 68.0 psi
12:29	pressure test 68.0 psi 1.1% change over 1 hr.
12:59	pressure test 68.0 psi
13:29	pressure test 68.0 psi 0 change over 1 hr
13:40	Allyssa Mork - FDEP On site Start Final pressure test
	68.0 psi - down hole 450 psi on packer
13:55	68.0 psi
14:10	68.0 psi
14:20	68.0 psi
14:30	68.0 psi
14:40	68.0 psi 0 change over 1 hr. A Mork - DEP
14:45	Obtained 4 Gal. water discharge from pressure release
	Begin tripping steel out of hole
17:10	JMP Off site
1900	JMP On Site

PRESSURE TEST RESULTS SHEET

WELL: DZMW-1 **PROJECT NUMBER:** 27335-45307 **PAGE:** 1 of 1

SITE LOCATION: Clewiston **PERMIT NO:** 249635-001-UC
WALL THICKNESS: 0.52" **CASING DEPTH:** 2132 ft bpl Drill Floor =
CASING DIAMETER: 6.5" OD **DATUM:** Pad Level = 19.78 ft NGVD 3.60 ft above pad

ELAPSED TIME (min)	CASING PRESSURE (psi)	CHANGE IN PRESSURE	PERCENT CHANGE	
0	69.75	0.00	0.00%	
15	69.75	0.00	0.00%	
30	69.75	0.00	0.00%	
45	69.75	0.00	0.00%	
55	69.75	0.00	0.00%	
60	69.75	0.00	0.00%	
Total Change	0.00		Percent Change - Total	0.00%

Permit Item Reference 6.c.(5)
Core Plug Analysis

Submittal Data
FROM

Youngquist Brothers, Inc.

15465 Pine Ridge Rd.
Ft. Myers, FL. 33908
239-489-4444 Fax: 239-489-4545

Project

City of Clewiston
Water System Improvements
Concentrate Disposal Injection Well

I have reviewed this submittal for general conformance with the design concepts and contract documents. Generally no conflict with materials or dimensions will arise from the approval of this shop drawing submittal.

Date: March 30, 2007 Number of Copies: 7

Submittal Number: 02856-002-A

Specification Section Number: 02856-002-A

Item Submitted: Core Lab Analysis

New Submittal: X Resubmitted:

Certification Statements: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar date and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.

Youngquist Brothers, Inc. Representative:

Shaun Skinner

- ☐ Approved
- ☐ Approved with changes
- ☐ Rejected
- ☐ Revise & Resubmit
- ☐ Not Reviewed

By:

Firm:

Date:

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

March 21, 2006
File Number 06-227

RECEIVED
MAR 23 2007

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft. Myers, FL 33908

Attention: Craig Brugger

Subject: Rock Core Testing, City of Clewiston Injection Well

Gentlemen:

As requested, vertical and horizontal permeability, unconfined compression and specific gravity tests have been completed on three limestone rock cores provided for testing by your firm. The initial samples were received on 11/28/06, and additional samples were received on 01/31/07. The designations for the samples are listed below.

Sample Number	Depth (feet)
11 -	2123 2124
7 -	2407 2410
5 -	2736 2734

Unconfined compression tests were performed in general accordance with ASTM Standard D 7012 "Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures" using the unconfined test method (Method C). The unconfined compression test results are presented on the attached test reports.

The permeability tests were performed in general accordance with ASTM Standard D 5084 "Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter" using the constant head test method (Method A). The permeability test results are presented on the attached test reports.

The specific gravity tests were performed in general accordance with ASTM Standard D 854 "Specific Gravity of Soil Solids by Water Pycnometer". The measured mineral specific gravities are presented on the attached reports.

The specimens were reported to be from the samples designated herein. The test results are indicative of only the specimens that were actually tested. The test results presented are based upon accepted industry practice as well as test method(s) listed. Ardaman & Associates, Inc. neither accepts responsibility for, nor makes claims to the final use and purpose of the material.

If you have any questions about the test results or require additional information, please contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

Thomas S. Ingra, P.E.
Laboratory Director
Florida License No. 31987

TSI/ed

G:\Projects\2006\06-227\06-227 Youngquist tsi 001.wpd

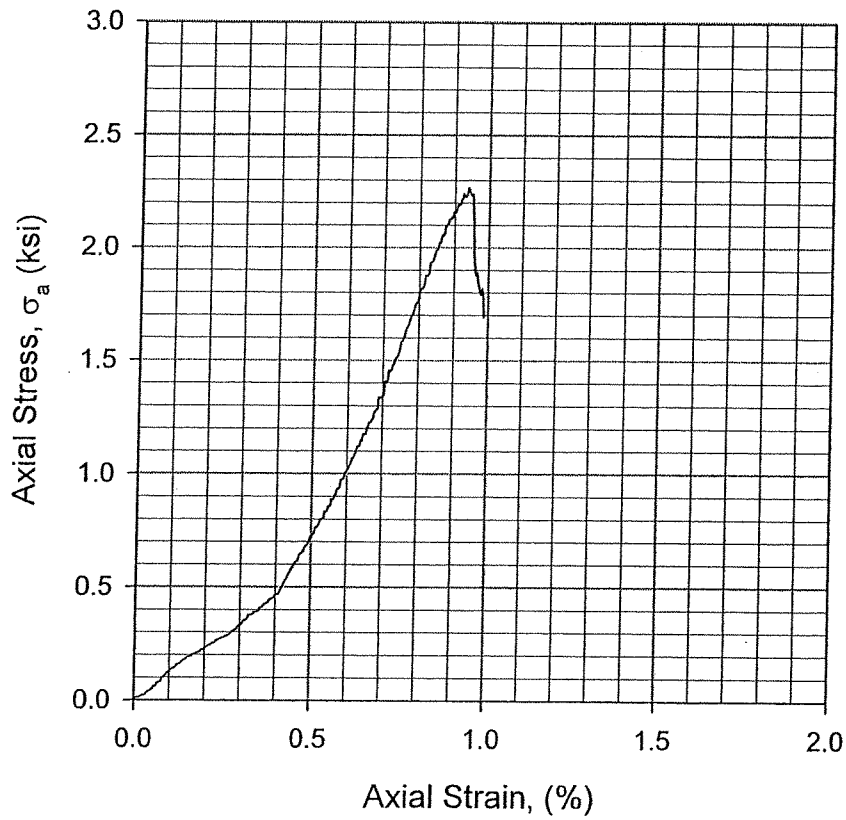
ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
PROJECT: City of Clewiston Injection Well
FILE NO.: 06-227

DATE SAMPLE RECEIVED: 02/01/07
DATE TEST SET-UP: 02/22/07
DATE REPORTED: 03/21/07

INCOMING SAMPLE NO.: 2124
BORING Core 1 SAMPLE -
DEPTH 2124 ☒ ft; ☐ m
LABORATORY IDENTIFICATION NO.: 06227/2124
SAMPLE DESCRIPTION: Light brown limestone

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)	Young's Modulus, E (lb/in^2)
H (cm)	D (cm)	H/D	w_c (%)	γ_d (lb/ft^3)	S (%)	$\dot{\varepsilon}$ (cm/minute)	$\dot{\varepsilon}$ (%/minute)			
6.81	3.26	2.1	6.1	126.4	48	0.013	0.19	5.0	2,270	3.1×10^5



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 20.0

Capping Material: ☐ None ☒ Lab-Stone ☐ Sulfur

Comments:

SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing: ☒ Yes ☐ No

G_s: 2.72 ☐ Assumed ☒ Measured

FAILURE SKETCH

Where: H = Specimen height; D = Specimen diameter; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\dot{\varepsilon}$ = Vertical displacement rate; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07 C:\Documents and Settings\jan.wildman\Documents\Projects\06\06-227\UC rock cores.wpd

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
PROJECT: City of Clewiston Injection Well
FILE NO.: 06-227

DATE SAMPLE RECEIVED: 02/01/07
DATE TEST SET-UP: 02/22/07
DATE REPORTED: 03/21/07

INCOMING SAMPLE NO.: 2410
BORING Core 1 SAMPLE -
DEPTH 2410 ☒ ft; ☐ m
LABORATORY IDENTIFICATION NO.: 06227/2410
SAMPLE DESCRIPTION: Brown dolomitic limestone

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)	Young's Modulus, E (lb/in^2)
H (cm)	D (cm)	H/D	w_c (%)	γ_d (lb/ft^3)	S (%)	$\dot{\varepsilon}$ (cm/minute)	$\dot{\varepsilon}$ (%/minute)			
6.65	3.27	2.0	1.1	163.8	36	0.013	0.19	Not measured	11,130	Not measured

No graph due to error in measuring deformation.

TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 20.0

Capping Material: ☐ None ☒ Lab-Stone ☐ Sulfur

Comments:

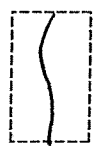
SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing: ☒ Yes ☐ No

G_s: 2.85 ☐ Assumed ☒ Measured

FAILURE SKETCH



Where: H = Specimen height; D = Specimen diameter; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\dot{\varepsilon}$ = Vertical displacement rate; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07 C:\Documents and Settings\jan.wildman\Documents\Projects\06\06-227\UC rock cores.wpd

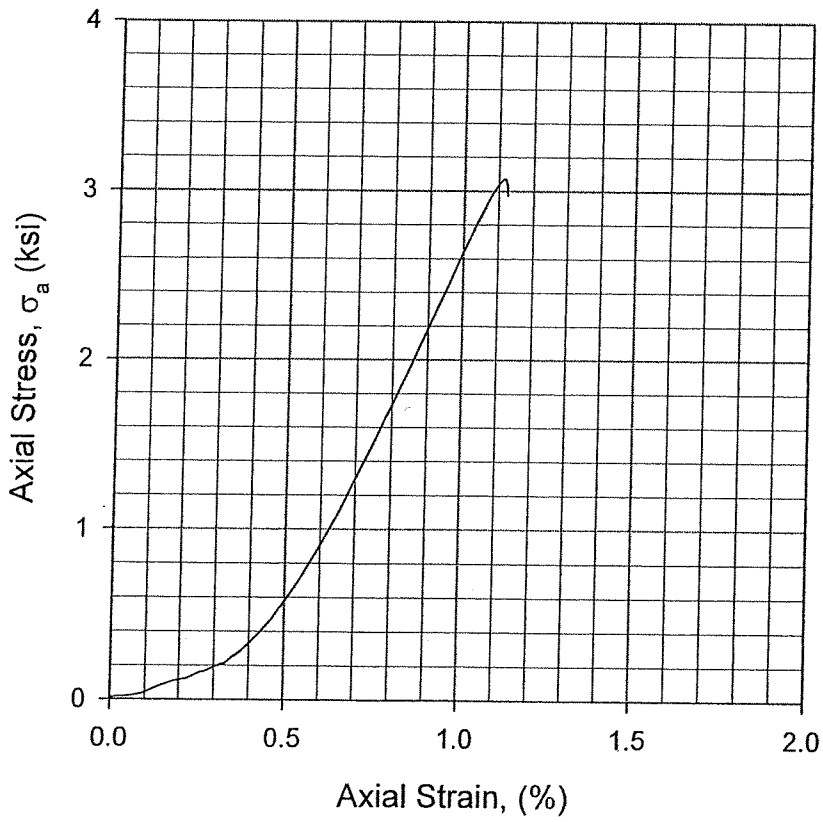
ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
PROJECT: City of Clewiston Injection Well
FILE NO.: 06-227

DATE SAMPLE RECEIVED: 02/01/07
DATE TEST SET-UP: 02/22/07
DATE REPORTED: 03/21/07

INCOMING SAMPLE NO.: 2734
BORING Core 1 SAMPLE -
DEPTH 2734 ☒ ft; ☐ m
LABORATORY IDENTIFICATION NO.: 06227/2734
SAMPLE DESCRIPTION: Mottled light brown limestone and brown dolomitic limestone

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)	Young's Modulus, E (lb/in^2)
H (cm)	D (cm)	H/D	w_c (%)	γ_d (lb/ft^3)	S (%)	$\dot{\varepsilon}$ (cm/minute)	$\dot{\varepsilon}$ (%/minute)			
9.45	5.02	1.9	3.5	136.9	37	0.013	0.14	8.3	3,070	4.2×10^5



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 20.0

Capping Material: ☐ None ☒ Lab-Stone ☐ Sulfur

Comments:

SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing: ☒ Yes ☐ No

G_s: 2.76 ☐ Assumed ☒ Measured

FAILURE SKETCH

Where: H = Specimen height; D = Specimen diameter; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\dot{\varepsilon}$ = Vertical displacement rate; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07 C:\Documents and Settings\jan.wildman\Documents\Projects\06\06-227\UC rock cores.wpd

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 01/29/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: S-11, 2123'

LABORATORY IDENTIFICATION NO.: 06227/S11-2123kV

SAMPLE DESCRIPTION: Light brown limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 96 %

- ☐ Beginning of Test;
- ☒ End of Test

$\Delta\sigma_c$ (psi): 4, 7, 10

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No

As-Received Length (inch): 3.6 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s: 2.72

- ☐ Assumed
- ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
9.19	9.96	715.74	10.8	129.3	0.238	94	30	160	11.2	2.3	1	1472.01	10.8	94	3.7×10^{-5}

COMMENTS: (1) Core sample selected for permeability testing was cut to length, air-dried, deaired under vacuum for a minimum of 24 hours, and then saturated with deaired tap water from the bottom up while still under vacuum. (2) Final w_c from horizontal permeability test specimen. WDS calculated from measured wet weight and final w_c.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: JM Date: 03/21/07

Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 02/06/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: **S-11, 2123'**

LABORATORY IDENTIFICATION NO.: 06227/S11-2123kH

SAMPLE DESCRIPTION: Light brown limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 98 %

- ☐ Beginning of Test;
- ☒ End of Test

$\Delta\sigma_c$ (psi): 3, 6, 9

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No

As-Received Length (inch): 3.6 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s: 2.72

- ☐ Assumed
- ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
6.74	5.01	133.15	10.8	130.4	0.232	97	30	160	34.5	4.6	1	278.11	10.8	97	4.7×10^{-5}

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07

Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 01/29/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: **S-7, 2407'**

LABORATORY IDENTIFICATION NO.: 06227/S7-2407kV

SAMPLE DESCRIPTION: Brown dolomitic limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 98 %

- ☐ Beginning of Test;
- ☒ End of Test

$\Delta\sigma_c$ (psi): 2, 7, 9

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No

As-Received Length (inch): 3.5 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s: 2.85

- ☐ Assumed
- ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
9.36	10.08	747.14	0.3	169.3	0.048	16	30	160	209.3	0.8	28	2022.00	0.6	31	9.9×10^{-11}

COMMENTS: (1) Core sample selected for permeability testing was cut to length, air-dried, deaired under vacuum for a minimum of 24 hours, and then saturated with deaired tap water from the bottom up while still under vacuum. (2) Final w_c from horizontal permeability test specimen. WDS calculated from measured wet weight and final w_c.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07

Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 03/09/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: **S-7, 2407'**

LABORATORY IDENTIFICATION NO.: 06227/S7-2407kVH

SAMPLE DESCRIPTION: Brown dolomitic limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 90 (stable) % ☐ Beginning of Test; ☒ End of Test

$\Delta\sigma_c$ (psi): 3, 6, 9

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No

As-Received Length (inch): 3.5 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s: 2.85 ☐ Assumed ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
6.59	5.01	129.98	0.5	170.2	0.043	31	30	160	30.3	1.0	4	354.87	0.6	41	2.4×10^{-9}

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07

Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 01/29/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: S-5, 2736'

LABORATORY IDENTIFICATION NO.: 06-227/S5-2736kV

SAMPLE DESCRIPTION: Light brown limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 89 (stable) % ☐ Beginning of Test; ☒ End of Test

$\Delta\sigma_c$ (psi): 4, 7, 10

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No

As-Received Length (inch): 4.5 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s: 2.76 ☐ Assumed ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
11.12	10.14	897.49	7.5	138.9	0.193	86	30	160	20.1	3.5	1	1997.49	7.5	86	5.9×10^{-7}

COMMENTS: (1) Core sample selected for permeability testing was cut to length, air-dried, deaired under vacuum for a minimum of 24 hours, and then saturated with deaired tap water from the bottom up while still under vacuum. (2) Final w_c from horizontal permeability test specimen. WDS calculated from measured wet weight and final w_c.

The test data and all associated project information presented hereon shall be held in confidence and disclosed to other parties only with the authorization of the Client or Ardaman & Associates, Inc. Physical and electronic records of each project are kept for a minimum of 7 years. Test samples are kept in storage for at least 10 working days after mailing of the test report, prior to being discarded, unless a longer storage period is requested in writing and accepted by Ardaman & Associates, Inc.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07

Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Clewiston Injection Well

FILE NO.: 06-227

DATE SAMPLE RECEIVED: 12/04/06 SET UP: 02/06/07

DATE REPORTED: 03/21/07

INCOMING LABORATORY SAMPLE NO.: **S-5, 2736'**

LABORATORY IDENTIFICATION NO.: 06-227/S5-2736kH

SAMPLE DESCRIPTION: Light brown limestone

ASTM D 5084 TEST METHOD:

- ☒ A - Constant Head
- ☐ B - Falling Head; Constant Tailwater
- ☐ C - Falling Head; Rising Tailwater
- ☐ F - Constant Volume; Falling Head - Rising Tailwater

B-FACTOR: 88 (stable) % ☐ Beginning of Test; ☒ End of Test

$\Delta\sigma_c$ (psi): 3, 6, 9

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No

As-Received Length (inch): 4.5 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s: 2.76 ☐ Assumed ☒ Measured (ASTM D 854)

PERMANENT: ☒ Deaired Tap Water ☐ Other

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm^3)	w_c (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm^3)	t (days)	WDS (g)	w_c (%)	S (%)	k_{20} (cm/sec)
7.18	5.03	142.36	5.0	150.4	0.127	94	30	160	74.8	0.6	1	342.69	5.0	94	3.9×10^{-7}

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.

Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); γ_d = Dry density; S = Saturation; $\bar{\sigma}_c$ = Isotropic effective confining stress; u_b = Back-pressure; i_{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k_{20} = Saturated hydraulicconductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 03/21/07

Form SR-2B: Rev. 0

Permit Item Reference 6.c.(6)
Background Water Quality Data for
Injection and Monitor Zones

SUBM[illegible]ION # 609-489

Logged in LIMS by MR

CSM assigned

CHAIN OF CUSTODY RECORD

Florida Environmental

1460 W. McNab Road Ft Laud. FL 33309 Tel: (954) 978-6400 Fax: (954) 978-2233
940 Alt. 27 South Babson Park, FL 33827 Tel: (863) 638-3255 Fax: (863) 638-3637
630 Indian Street Savannah, GA 31401 Tel: (912) 238-5050 Fax: (912) 234-4815
528 Gooch Road Fort Meade, FL 33841 Tel: (863) 285-8145 Fax: (863) 285-7030

DUE DA[illegible] Requested

RUSH RESERVATION #

Rush Surcharges apply

Original-Return w/report | Yellow- Lab File Copy | Pink- Sampler Copy

Report to: (company name) Youngquist Brothers

Invoice to: (company name) Same

Purchase Order #

Project Name and/or Number Clewiston IW-1 McCullers

Project Contact: ~~Andy Miller~~ (Edward)

Phone: (904) 662-7179

Sampler Name: (printed) Alberto Pozo

Report to Address: On File

Invoice to Address:

Site Location: Clewiston, FL

Fax:

Email:

Sampler Signature

ORDER # Lab Control Number / Shaded Areas For Laboratory Use Only	Sample ID	Date Sampled	Time Sampled	Matrix (DW GW S SED HW SEA X AIR / SW WW BIO OIL)	Bottle & Pres. Combo Codes	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required: Primary	Analysis Required: secondary	Analysis Required: See Attached List...	Field Tests: TEMP-C	Field Tests: PH	Field Tests: COND	Field Tests: CHLOR
1	22957	IW-1 Injection Zone	9/25/06	09:30	DW	D	20	X	X				
2													
3													
4													
5													
6		Gt 4At 2Lt HT TT TOTH TN											
7		2VM 3VC 3VA											
8													
9													
10													

Special Comments:

"I waive NELAC protocol" (sign here) >

Total

Deliverables: QA/QC Report Needed? Yes No *(additional charge)*

SAMPLE CUSTODY AND TRANSFER SIGNATURES		DATE / TIME
1	Relinquished by:	9/25/06 17:34
1	Received by:	9/25/06 1734
2	Relinquished by:	
2	Received by:	
3	Relinquished by:	
3	Received by:	

www.flenviro.com COC Page of

Sample Custody & Field Comments

Temp as received 4 C

Custody Seals? Y N

Billable Field Time 4 hrs

Misc. Charges

Bottle Type

A-liter amber
B-Bacteria bag/bottle
F-500 ml O-125 ml
L-liter bottle
S4- 4 oz soil jar / S8- 8 oz soil jar
T-250 ml
V-40 ml vial
W-wide mouth
X-other TED=Tedlar Air Bag

Preservatives

A-ascorbic acid P-H3PO4
C-HCL S-H2SO4
Cu-CuSO4 T-Na2S2O3-H2O
H-HNO3 U-Unpreserved
M-MCAB P-H3PO4
N-NaOH Z-zinc acetate
NH4-NH4CL

Data Qualifier Codes

A Value reported is the mean (average) of two or more determinations.

B Results based upon colony counts outside the acceptable range. The code is to be used if the colony count is generated from a plate in which the total number of Coliform colonies exceeds the method indicated ideal ranges, which are:
Total Coliforms: 20-80 colonies
Fecal Coliforms: 20-60 colonies

C Result was confirmed by a separate analysis of the sample.

D Measurement was made in the field (i.e. in situ). This applies to any value (ex. pH, specific conductance, etc.) that was obtained under field conditions using approved analytical methods.

H Value based on field kit determination; results may not be accurate.

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

J Estimated value; value not accurate. This code shall be used in the following instances:
1. surrogate recovery limits have been exceeded.
2. no known quality control criteria exists for the component
3. the reported value failed to meet the established quality control criteria for either precision or accuracy.
4. the sample matrix interfered with the ability to make any accurate determination; or
5. if the data is questionable because of improper laboratory or field protocols (e.g. composite sample was collected instead of a grab sample).

N Presumptive evidence of presence of material. This qualifier shall be used if:
1. the component has been tentatively identified based on mass spectral library search.a
2. there is an indication that the analyte is present, but quality control requirements for confirmation were not met

O Sampled, but analysis lost or not performed; sample compromised.

Q Sample held beyond accepted holding time. This code shall be used if the value is derived from a sample that was prepared or analyzed after the approved holding time restrictions for sample preparation or analysis.

R Significant rain in the past 48 hours. This code shall be used when the rainfall might contribute to a lower than normal value.

T Value reported is less than the laboratory method detection limit

U Indicated that the compound was analyzed for but not detected. This shall be used to indicate that the specified component was not detected. The value associated with the qualifier shall be the laboratory method detection limit

V Indicated that the analyte was detected in both the sample and the associated method blank. Note: the value in the blank shall not be subtracted from associated samples.

Y The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.

Z Too many colonies were present (TNTC), the numeric value represents the filtration volume.

? Data is rejected and should not be used. Some of all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.

* Not analyzed due to interference.

! Data deviates from historically established concentration ranges.

~ Analysis performed outside NELAP program. (e.g. State of Georgia, UCMR, ICR or other certification.)

Florida Environmental

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 10/23/06
Submission # 609000489
Order # 22957

Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Biochemical Oxygen Demand	U	U	mg/L	2.0	6.0	405.1	09/27 13:00	10/02 10:00	CRL
Coliform-Total (E-Coli)	A		-------			9223B	09/26 17:35	09/27 17:35	DSM
Specific Conductance (grab)	54400		Ω*cm.	0.1	0.3	120.1	09/26 13:25	09/26 13:25	EMS
pH	7.37	Q	units	0.1	0.3	150.1	09/27 13:45	09/27 13:45	EMS
al Dissolved Solids (TDS)	34200		mg/L	0.82	2.46	EPA 160.1	09/27 11:43	09/27 11:43	EMS
Fluoride	0.76		mg/L	0.046	0.138	300.0	09/28 09:24	09/28 09:24	JRB
Nitrate (as N)	0.46		mg/L	0.048	0.144	300.0	09/27 09:56	09/28 09:56	JRB
Nitrate+Nitrite (as N)	0.46		mg/L	0.011	0.033	300.0	09/28 12:15	09/28 12:15	EAC
Nitrite (as N)	U	U	mg/L	0.031	0.093	300.0	09/27 12:55	09/28 12:55	JB
Sulfate	2800		mg/L	33.400	100.200	300.0	10/05 15:48	10/05 15:48	JRB
Cyanide, Total	U	U	mg/L	0.002	0.006	335.3	09/28 12:33	09/28 12:33	EAC
Nitrogen (Ammonia) as N	2.65		mg/L	0.1	0.3	350.1	09/29 12:39	09/29 12:39	EAC
Nitrogen (Kjeldahl) as "N"	3.39		mg/L	0.025	0.075	351.2	10/05 14:49	10/05 14:49	EAC
Nitrogen (Total Organic)	0.74		mg/L	0.041	0.123	351.2	10/05 14:49	10/05 14:49	EAC
Phosphate, Ortho	0.070		mg/L	0.003	0.009	365.2	09/27 11:56	09/27 11:56	EMS
Phosphorus, Total as "P"	0.15		mg/L	0.003	0.009	365.4	10/05 14:37	10/05 14:37	EAC
Chemical Oxygen Demand	795		mg/L	19.80	59.40	410.4	10/03 13:02	10/03 13:02	EMS
MBAS Surfactants (LAS Mol.Wt. 340)	U	U	mg/L	0.02	0.06	425.1	09/26 16:29	09/26 16:29	JRB

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 10/23/06
Submission # 609000489
Order # 22957

Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Odor (Lab)	2.00		TON	0.1	0.3	SM2150B	09/26 11:16	09/26 11:16	EMS
Color (Lab)	15.0		Pt-Co	0.1	0.3	SM2120B	09/26 11:14	09/26 11:14	EMS
Langelier Index (Corrosivity)(Water) (0	0.697					SM 2330B	09/25	10/04	EMS
Chloride	24000		mg/L	100.00	300.00	SM4500CL-B	09/29 13:27	09/29 13:27	LA
luminum	0.03		mg/L	0.009	0.027	200.7	09/26 09:00	09/26 18:21	IMN
Iron	0.72		mg/L	0.002	0.006	200.7	09/26	09/26 18:21	IMN
Sodium	9212		mg/L	1.000	3.000	200.7	09/26	09/27 14:46	IMN
Zinc	0.05		mg/L	0.00056	0.00168	200.7	09/26	09/26 18:21	IMN
200.8 DW-10 Metals in Drinking Water 62-550.310				**Dilution Factor =1**					
Arsenic	0.0392		mg/L	0.00002	0.00006	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Barium	0.0399		mg/L	0.0002	0.0006	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Cadmium	U	U	mg/L	0.00001	0.00003	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Chromium	0.0091		mg/L	0.00004	0.00012	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Lead	0.0221		mg/L	0.00006	0.00018	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Nickel	0.0119		mg/L	0.00004	0.00012	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Selenium	U	U	mg/L	0.00013	0.00039	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Antimony	U	U	mg/L	0.00003	0.00009	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Beryllium	U	U	mg/L	0.00003	0.00009	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT

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Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Thallium	U	U	mg/L	0.00001	0.00003	4.1.3/200.8	09/28 16:09	09/28 16:09	KYT
Copper	0.0516		mg/L	0.00016	0.00048	200.8	09/28	09/28 16:09	KYT
Manganese	0.0065		mg/L	0.00007	0.00021	200.8	09/28	09/28 16:09	KYT
Silver	U	U	mg/L	0.00002	0.00006	200.8	09/28	09/28 16:09	KYT
:rcury	U	U	mg/L	0.0002	0.0006	245.1	09/29	09/29 21:03	EN
504.1 EDB, DBCP: 62-550.310(4)(b)				**Dilution Factor =1**					
1,2-Dibromo-3-Chloropropane (DBCP)	U		ug/L	0.00		EPA 504.1 ECD	09/2810:00	09/28 17:23	RGC
Ethylene Dibromide (EDB)	U		ug/L	0.00		EPA 504.1 ECD	09/2810:00	09/28 17:23	RGC
508 Pesticides & PCBs: 62-550.310(4)(b)				**Dilution Factor =1**					
Hexachlorocyclopentdiene	U	U	ug/L	0.42	1.26	508	09/26 12:00	09/28 10:10	RGC
Hexachlorobenzene	U	U	ug/L	0.42	1.26	508	09/26 12:00	09/28 10:10	RGC
v-BHC (Lindane)	U	U	ug/L	0.004	0.012	508	09/26 12:00	09/28 10:10	RGC
Heptachlor	U	U	ug/L	0.005	0.015	508	09/26 12:00	09/28 10:10	RGC
Heptachlor Epoxide	U	U	ug/L	0.008	0.024	508	09/26 12:00	09/28 10:10	RGC
Endrin	U	U	ug/L	0.005	0.015	508	09/26 12:00	09/28 10:10	RGC
Methoxychlor	U	U	ug/L	0.007	0.021	508	09/26 12:00	09/28 10:10	RGC
Arochlor 1016	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
Arochlor 1221	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC

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Site Location: Clewiston, FL
Matrix: Drinking Water

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Arochlor 1232	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
Arochlor 1242	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
Arochlor 1248	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
Arochlor 1254	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
rochlor 1260	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
Toxaphene	U	U	ug/L	0.40	1.20	508	09/26 12:00	09/28 10:10	RGC
Chordane	U	U	ug/L	0.10	0.30	508	09/26 12:00	09/28 10:10	RGC
508 Pesticides 62-550.405 UNREGULATED				**Dilution Factor =1**					
Propachlor	U		ug/L			508	09/26 16:21	09/28 10:10	RGC
Aldrin	U		ug/L			508	09/26 16:21	09/28 10:10	RGC
Dieldrin	U	U	ug/L	0.03	0.09	508	09/26 16:21	09/28 10:10	RGC
515.3 Chlorophenoxy Herbicides: 62-550.310(4)(b)				**Dilution Factor =1**					
Dalapon	U	U	ug/L	0.270	0.810	515.3	09/27 09:14	09/29 09:14	DS
2,4-D	U	U	ug/L	0.483	1.449	515.3	09/27 09:14	09/29 09:14	DS
Pentachlorophenol	U	U	ug/L	0.051	0.153	515.3	09/27 09:14	09/29 09:14	DS
2,4,5-TP (silvex)	U	U	ug/L	0.483	1.449	515.3	09/27 09:14	09/29 09:14	DS
Dinoseb	U	U	ug/L	0.298	0.894	515.3	09/27 09:14	09/29 09:14	DS
Picloram	U	U	ug/L	0.366	1.098	515.3	09/27 09:14	09/29 09:14	DS

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
524.2 Volatile Organics: 62-550.310(4)(a)				Dilution Factor =1					
Vinyl Chloride	U	U	ug/L	0.34	1.02	524.2	09/27 05:15	09/27 05:15	MMD
1,1-Dichloroethylene	U	U	ug/L	0.52	1.56	524.2	09/27 05:15	09/27 05:15	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	0.99	2.97	524.2	09/27 05:15	09/27 05:15	MMD
rans-1,2-Dichloroethylene	U	U	ug/L	0.50	1.50	524.2	09/27 05:15	09/27 05:15	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	09/27 05:15	09/27 05:15	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	524.2	09/27 05:15	09/27 05:15	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	524.2	09/27 05:15	09/27 05:15	MMD
Benzene	U	U	ug/L	0.09	0.27	524.2	09/27 05:15	09/27 05:15	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	524.2	09/27 05:15	09/27 05:15	MMD
Trichloroethylene	U	U	ug/L	0.09	0.27	524.2	09/27 05:15	09/27 05:15	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	524.2	09/27 05:15	09/27 05:15	MMD
Toluene	U	U	ug/L	0.14	0.42	524.2	09/27 05:15	09/27 05:15	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	09/27 05:15	09/27 05:15	MMD
Tetrachloroethylene	U	U	ug/L	0.11	0.33	524.2	09/27 05:15	09/27 05:15	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	524.2	09/27 05:15	09/27 05:15	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	524.2	09/27 05:15	09/27 05:15	MMD
Xylenes (Total)	3.41		ug/L	0.21	0.63	524.2	09/27 05:15	09/27 05:15	MMD

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Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Styrene	U	U	ug/L	0.17	0.51	524.2	09/27 05:15	09/27 05:15	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.14	0.42	524.2	09/27 05:15	09/27 05:15	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.48	1.44	524.2	09/27 05:15	09/27 05:15	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	524.2	09/27 05:15	09/27 05:15	MMD
1.2 Volatile Organics: 62-550. UNREGULATED				Dilution Factor =1					
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	524.2	09/27 05:15	09/27 05:15	MMD
Chloromethane	U	U	ug/L	0.35	1.05	524.2	09/27 05:15	09/27 05:15	MMD
Bromomethane	U	U	ug/L	0.41	1.23	524.2	09/27 05:15	09/27 05:15	MMD
Chloroethane	U	U	ug/L	0.17	0.51	524.2	09/27 05:15	09/27 05:15	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	524.2	09/27 05:15	09/27 05:15	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	524.2	09/27 05:15	09/27 05:15	MMD
1,1-Dichloroethane	U	U	ug/L	0.53	1.59	524.2	09/27 05:15	09/27 05:15	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	524.2	09/27 05:15	09/27 05:15	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	524.2	09/27 05:15	09/27 05:15	MMD
Chloroform	U	U	ug/L	0.80	2.40	524.2	09/27 05:15	09/27 05:15	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	524.2	09/27 05:15	09/27 05:15	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	524.2	09/27 05:15	09/27 05:15	MMD
Dibromomethane	U	U	ug/L	0.42	1.26	524.2	09/27 05:15	09/27 05:15	MMD

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Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	524.2	09/27 05:15	09/27 05:15	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	524.2	09/27 05:15	09/27 05:15	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	09/27 05:15	09/27 05:15	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	524.2	09/27 05:15	09/27 05:15	MMD
Dibromochloromethane	U	U	ug/L	0.39	1.17	524.2	09/27 05:15	09/27 05:15	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	524.2	09/27 05:15	09/27 05:15	MMD
Bromoform	U	U	ug/L	0.38	1.14	524.2	09/27 05:15	09/27 05:15	MMD
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	524.2	09/27 05:15	09/27 05:15	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	524.2	09/27 05:15	09/27 05:15	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	524.2	09/27 05:15	09/27 05:15	MMD
2-Chlorotoluene (ortho)	U	U	ug/L	0.13	0.39	524.2	09/27 05:15	09/27 05:15	MMD
4-Chlorotoluene (para)	U	U	ug/L	0.16	0.48	524.2	09/27 05:15	09/27 05:15	MMD
1,3-Dichlorobenzene (meta)	U	U	ug/L	0.20	0.60	524.2	09/27 05:15	09/27 05:15	MMD
1,2-Dibromo-3-Chloropropane	U	U	ug/L	0.30	0.90	524.2	09/27 05:15	09/27 05:15	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				**Dilution Factor =1**					
Di(2-Ethylhexyl)phthalate	21.1		ug/L	0.36	1.08	525.2	09/27 12:00	09/28 14:33	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.36	1.08	525.2	09/27 12:00	09/28 14:33	AC
Benzo(a)pyrene	U	U	ug/L	0.017	0.051	525.2	09/27 12:00	09/28 14:33	AC

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Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	09/27 12:00	09/28 14:33	AC
Alachlor	U	U	ug/L	0.20	0.60	525.2	09/27 12:00	09/28 14:33	AC
Atrazine	U	U	ug/L	0.20	0.60	525.2	09/27 12:00	09/28 14:33	AC
Simazine	U	U	ug/L	0.20	0.60	525.2	09/27 12:00	09/28 14:33	AC
5.2 Semivolatile Organics: 62-550.UNREGULATED				Dilution Factor =1					
Butyl benzyl phthalate	U	U	ug/L	1.44	4.32	525.2	09/27 14:52	09/28 14:52	AC
Di-n-butylphthalate	U	U	ug/L	1.2	3.6	525.2	09/27 14:52	09/28 14:52	AC
Diethylphthalate	U	U	ug/L	3.4	10.2	525.2	09/27 14:52	09/28 14:52	AC
Dimethylphthalate	U	U	ug/L	3.7	11.1	525.2	09/27 14:52	09/28 14:52	AC
2,4-dinitrotoluene	U	U	ug/L	1.17	3.51	525.2	09/27 14:52	09/28 14:52	AC
Dioctylphthalate	U	U	ug/L	1.86	5.58	525.2	09/27 14:52	09/28 14:52	AC
Isophorone	U	U	ug/L	1.56	4.68	525.2	09/27 14:52	09/28 14:52	AC
(Dioxin) {Screen/Optional}	U	U	ug/L	0.03	0.09	525.2	09/27 14:52	09/28 14:52	AC
2-chlorophenol	U	U	ug/Kg	1.47	4.41	525.2	09/27 14:52	09/28 14:52	AC
2-methyl-4,6-dinitrophenol	U	U	ug/L	3.0	9.0	525.2	09/27 14:52	09/28 14:52	AC
Phenol	U	U	ug/L	1.86	5.58	525.2	09/27 14:52	09/28 14:52	AC
2,4,6-trichlorophenol	U	U	ug/L	3.0	9.0	525.2	09/27 14:52	09/28 14:52	AC
608 Chlorinated Pesticides & PCBs in WATER				Dilution Factor =1					

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LABORATORY ANALYSIS REPORT

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a-BHC	U	U	ug/L	0.005	0.015	EPA 608	09/26 12:00	09/28 20:52	RGC
b-BHC	U	U	ug/L	0.005	0.015	EPA 608	09/26 12:00	09/28 20:52	RGC
g-BHC (lindane)	U	U	ug/L	0.004	0.012	EPA 608	09/26 12:00	09/28 20:52	RGC
d-BHC	U	U	ug/L	0.005	0.015	EPA 608	09/26 12:00	09/28 20:52	RGC
Heptachlor	U	U	ug/L	0.005	0.015	EPA 608	09/26 12:00	09/28 20:52	RGC
Aldrin	U	U	ug/L	0.017	0.051	EPA 608	09/26 12:00	09/28 20:52	RGC
Heptachlor Epoxide	U	U	ug/L	0.008	0.024	EPA 608	09/26 12:00	09/28 20:52	RGC
Endosulfan I	U	U	ug/L	0.006	0.018	EPA 608	09/26 12:00	09/28 20:52	RGC
Dieldrin	U	U	ug/L	0.006	0.018	EPA 608	09/26 12:00	09/28 20:52	RGC
4,4-DDE	U	U	ug/L	0.39	1.17	EPA 608	09/26 12:00	09/28 20:52	RGC
Endrin	U	U	ug/L	0.005	0.015	EPA 608	09/26 12:00	09/28 20:52	RGC
Endosulfan II	U	U	ug/L	0.006	0.018	EPA 608	09/26 12:00	09/28 20:52	RGC
4,4-DDD	U	U	ug/L	0.60	1.80	EPA 608	09/26 12:00	09/28 20:52	RGC
Endrin Aldehyde	U	U	ug/L	0.010	0.030	EPA 608	09/26 12:00	09/28 20:52	RGC
Endosulfan Sulfate	U	U	ug/L	0.007	0.021	EPA 608	09/26 12:00	09/28 20:52	RGC
4,4-DDT	U	U	ug/L	0.69	2.07	EPA 608	09/26 12:00	09/28 20:52	RGC
Methoxychlor	U	U	ug/L	0.007	0.021	EPA 608	09/26 12:00	09/28 20:52	RGC
Aroclor 1016	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC

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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 10/23/06
Submission # 609000489
Order # 22957

Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Aroclor 1221	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
Aroclor 1232	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
Aroclor 1242	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
Aroclor 1248	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
\roclor 1254	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
Aroclor 1260	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
Toxaphene	U	U	ug/L	0.40	1.20	EPA 608	09/26 12:00	09/28 20:52	RGC
Chlordane	U	U	ug/L	0.10	0.30	EPA 608	09/26 12:00	09/28 20:52	RGC
625 Semivolatile Organics in Water by GC/MS				Dilution Factor =1					
N-Nitrosodimethylamine	U	U	ug/L	0.50	1.50	625	09/29 12:00	09/30 07:47	AC
Phenol	U	U	ug/L	0.38	1.14	625	09/29 12:00	09/30 07:47	AC
Bis (2-Chloroethyl) Ether	U	U	ug/L	0.85	2.55	625	09/29 12:00	09/30 07:47	AC
2-Chlorophenol	U	U	ug/L	0.45	1.35	625	09/29 12:00	09/30 07:47	AC
1,3-Dichlorobenzene	U	U	ug/L	0.80	2.40	625	09/29 12:00	09/30 07:47	AC
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	625	09/29 12:00	09/30 07:47	AC
Benzyl Alcohol	U	U	ug/L	0.75	2.25	625	09/29 12:00	09/30 07:47	AC
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	625	09/29 12:00	09/30 07:47	AC
Bis (2-Chloroisopropyl) Ether *	U	U	ug/L	0.85	2.55	625	09/29 12:00	09/30 07:47	AC

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Collected: 09/25/06 09:30
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
N-Nitrosodi-N-Propylamine	U	U	ug/L	1.14	3.42	625	09/29 12:00	09/30 07:47	AC
Hexachloroethane	U	U	ug/L	2.31	6.93	625	09/29 12:00	09/30 07:47	AC
Nitrobenzene *	U	U	ug/L	0.66	1.98	625	09/29 12:00	09/30 07:47	AC
Isophorone	U	U	ug/L	1.56	4.68	625	09/29 12:00	09/30 07:47	AC
Nitrophenol	U	U	ug/L	1.09	3.27	625	09/29 12:00	09/30 07:47	AC
2,4-Dimethylphenol	U	U	ug/L	0.62	1.86	625	09/29 12:00	09/30 07:47	AC
Bis (2-Chloroethoxy)methane *	U	U	ug/L	1.89	5.67	625	09/29 12:00	09/30 07:47	AC
2,4-Dichlorophenol	U	U	ug/L	1.11	3.33	625	09/29 12:00	09/30 07:47	AC
1,2,3-Trichlorobenzene	U	U	ug/L	2.00	6.00	625	09/29 12:00	09/30 07:47	AC
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	625	09/29 12:00	09/30 07:47	AC
Naphthalene	U	U	ug/L	0.02	0.06	625	09/29 12:00	09/30 07:47	AC
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	625	09/29 12:00	09/30 07:47	AC
4-Chloro-3-Methylphenol	U	U	ug/L	0.67	2.01	625	09/29 12:00	09/30 07:47	AC
1-Methylnaphthalene	U	U	ug/L	0.36	1.08	625	09/29 12:00	09/30 07:47	AC
2-Methylnaphthalene	U	U	ug/L	0.02	0.06	625	09/29 12:00	09/30 07:47	AC
2-Methylphenol (o-cresol)	U	U	ug/L	1.00	3.00	625	09/29 12:00	09/30 07:47	AC
Hexachlorocyclopentadiene	U	U	ug/L	0.42	1.26	625	09/29 12:00	09/30 07:47	AC
3-MethylPhenol (m-cresol)	U	U	ug/L	0.84	2.52	625	09/29 12:00	09/30 07:47	AC

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Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
4-Methylphenol (p-cresol)	U	U	ug/L	1.16	3.48	625	09/29 12:00	09/30 07:47	AC
2,3,6-Trichlorophenol	U	U	ug/L	1.2	3.6	625	09/29 12:00	09/30 07:47	AC
2,4,5-Trichlorophenol	U	U	ug/L	0.81	2.43	625	09/29 12:00	09/30 07:47	AC
2,4,6-Trichlorophenol	U	U	ug/L	0.78	2.34	625	09/29 12:00	09/30 07:47	AC
-Chloronaphthalene	U	U	ug/L	1.16	3.48	625	09/29 12:00	09/30 07:47	AC
Dimethyl Phthalate	U	U	ug/L	3.70	11.10	625	09/29 12:00	09/30 07:47	AC
Acenaphthylene	U	U	ug/L	0.02	0.06	625	09/29 12:00	09/30 07:47	AC
2,6-Dinitrotoluene	U	U	ug/L	0.54	1.62	625	09/29 12:00	09/30 07:47	AC
Acenaphthene	U	U	ug/L	0.02	0.06	625	09/29 12:00	09/30 07:47	AC
2,4-Dinitrophenol	U	U	ug/L	1.0	3.0	625	09/29 12:00	09/30 07:47	AC
2,4-Dinitrotoluene	U	U	ug/L	1.17	3.51	625	09/29 12:00	09/30 07:47	AC
4-Nitrophenol	U	U	ug/L	1.0	3.0	625	09/29 12:00	09/30 07:47	AC
Diethyl Phthalate	U	U	ug/L	3.40	10.20	625	09/29 12:00	09/30 07:47	AC
Fluorene	U	U	ug/L	0.01	0.03	625	09/29 12:00	09/30 07:47	AC
4-Chlorophenyl Phenyl Ether	U	U	ug/L	0.87	2.61	625	09/29 12:00	09/30 07:47	AC
4,6-Dinitro-2-Methylphenol	U	U	ug/L	1.40	4.20	625	09/29 12:00	09/30 07:47	AC
N-Nitrosodiphenylamine	U	U	ug/L	3.42	10.26	625	09/29 12:00	09/30 07:47	AC
4-Bromophenyl Phenyl Ether	U	U	ug/L	1.44	4.32	625	09/29 12:00	09/30 07:47	AC

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Hexachlorobenzene	U	U	ug/L	0.42	1.26	625	09/29 12:00	09/30 07:47	AC
Pentachlorophenol	U	U	ug/L	1.14	3.42	625	09/29 12:00	09/30 07:47	AC
Phenanthrene	U	U	ug/L	0.028	0.084	625	09/29 12:00	09/30 07:47	AC
Anthracene	U	U	ug/L	0.049	0.147	625	09/29 12:00	09/30 07:47	AC
Di-N-Butyl Phthalate	5.85		ug/L	1.200	3.600	625	09/29 12:00	09/30 07:47	AC
Fluoranthene	U	U	ug/L	0.025	0.075	625	09/29 12:00	09/30 07:47	AC
Benzidine *	U	U	ug/L	4.00	12.00	625	09/29 12:00	09/30 07:47	AC
Pyrene	U	U	ug/L	0.017	0.051	625	09/29 12:00	09/30 07:47	AC
Butyl Benzyl Phthalate	U	U	ug/L	1.44	4.32	625	09/29 12:00	09/30 07:47	AC
Benzo(A)Anthracene	U	U	ug/L	0.017	0.051	625	09/29 12:00	09/30 07:47	AC
3,3-Dichlorobenzidine	U	U	ug/L	2.00	6.00	625	09/29 12:00	09/30 07:47	AC
Chrysene	U	U	ug/L	0.75	2.25	625	09/29 12:00	09/30 07:47	AC
Bis (2 Ethylhexyl) Phthalate	19.5		ug/L	2.37	7.11	625	09/29 12:00	09/30 07:47	AC
Di-N-Octyl Phthalate	U	U	ug/L	1.40	4.20	625	09/29 12:00	09/30 07:47	AC
Benzo(B)Fluoranthene	U	U	ug/L	0.029	0.087	625	09/29 12:00	09/30 07:47	AC
Benzo(K)Fluoranthene	U	U	ug/L	0.025	0.075	625	09/29 12:00	09/30 07:47	AC
Benzo(A)Pyrene	U	U	ug/L	0.017	0.051	625	09/29 12:00	09/30 07:47	AC
Indeno(1,2,3-CD)Pyrene	U	U	ug/L	0.93	2.79	625	09/29 12:00	09/30 07:47	AC

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LABORATORY ANALYSIS REPORT

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Dibenzo(A,H,)Anthracene	U	U	ug/L	0.029	0.087	625	09/29 12:00	09/30 07:47	AC
Benzo(G,H,I)Perylene	U	U	ug/L	0.017	0.051	625	09/29 12:00	09/30 07:47	AC
Bis-2-ethylhexyl Adipate	U	U	ug/L	0.36	1.08	625	09/29 12:00	09/30 07:47	AC
Aldrin *	U	U	ug/L	0.017	0.051	625	09/29 12:00	09/30 07:47	AC
lpha-BHC *	U	U	ug/L	0.005	0.015	625	09/29 12:00	09/30 07:47	AC
beta-BHC *	U	U	ug/L	0.005	0.015	625	09/29 12:00	09/30 07:47	AC
delta-BHC *	U	U	ug/L	0.005	0.015	625	09/29 12:00	09/30 07:47	AC
gamma-BHC (Lindane) *	U	U	ug/L	0.004	0.012	625	09/29 12:00	09/30 07:47	AC
Chlordane (Screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
4,4'-DDD *	U	U	ug/L	0.60	1.80	625	09/29 12:00	09/30 07:47	AC
4,4'-DDE *	U	U	ug/L	0.39	1.17	625	09/29 12:00	09/30 07:47	AC
4,4'-DDT *	U	U	ug/L	0.69	2.07	625	09/29 12:00	09/30 07:47	AC
Dieldrin *	U	U	ug/L	0.006	0.018	625	09/29 12:00	09/30 07:47	AC
Endosulfan I *	U	U	ug/L	0.006	0.018	625	09/29 12:00	09/30 07:47	AC
Endosulfan II *	U	U	ug/L	0.006	0.018	625	09/29 12:00	09/30 07:47	AC
Endosulfan Sulfate *	U	U	ug/L	0.007	0.021	625	09/29 12:00	09/30 07:47	AC
Endrin *	U	U	ug/L	0.005	0.015	625	09/29 12:00	09/30 07:47	AC
Endrin Aldehyde *	U	U	ug/L	0.010	0.030	625	09/29 12:00	09/30 07:47	AC

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Heptachlor *	U	U	ug/L	0.005	0.015	625	09/29 12:00	09/30 07:47	AC
Heptachlor Epoxide *	U	U	ug/L	0.008	0.024	625	09/29 12:00	09/30 07:47	AC
Toxaphene *	U	U	ug/L	0.40	1.20	625	09/29 12:00	09/30 07:47	AC
PCB-1016 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1221 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1232 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1242 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1248 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1254 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
PCB-1260 (screen) *	U	U	ug/L	0.10	0.30	625	09/29 12:00	09/30 07:47	AC
Dioxin (screen)	U	U	ug/L	0.03	0.09	625	09/29 12:00	09/30 07:47	AC
Azobenzene *	U	U	ug/L	0.75	2.25	625	09/29 12:00	09/30 07:47	AC
Methoxychlor *	U	U	ug/L	0.007	0.021	625	09/29 12:00	09/30 07:47	AC
Benzoic Acid	U	U	ug/L	0.84	2.52	625	09/29 12:00	09/30 07:47	AC
Aniline	U	U	ug/L	0.50	1.50	625	09/29 12:00	09/30 07:47	AC
4-Chloroaniline	U	U	ug/L	0.65	1.95	625	09/29 12:00	09/30 07:47	AC
Dibenzofuran	U	U	ug/L	0.66	1.98	625	09/29 12:00	09/30 07:47	AC
2-Nitroaniline	U	U	ug/L	0.58	1.74	625	09/29 12:00	09/30 07:47	AC

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3-Nitroaniline	U	U	ug/L	0.50	1.50	625	09/29 12:00	09/30 07:47	AC
4-Nitroaniline	U	U	ug/L	0.84	2.52	625	09/29 12:00	09/30 07:47	AC
Carbazole *	U	U	ug/L	0.68	2.04	625	09/29 12:00	09/30 07:47	AC
2,6-Dichlorophenol	U	U	ug/L	0.89	2.67	625	09/29 12:00	09/30 07:47	AC
ridine	U	U	ug/L	0.99	2.97	625	09/29 12:00	09/30 07:47	AC
2,3,4,6-Tetrachlorophenol	U	U	ug/L	1.00	3.00	625	09/29 12:00	09/30 07:47	AC
2,3,5,6-Tetrachlorophenol	U	U	ug/L	0.80	2.40	625	09/29 12:00	09/30 07:47	AC
8260.C Volatile Organics in Water by GC/MS				**Dilution Factor =1**					
Acetone	U	U	ug/L	1.75	5.25	5030/8260C	09/27 05:15	09/27 05:15	MMD
Acrolein	U	U	ug/L	0.75	2.25	5030/8260C	09/27 05:15	09/27 05:15	MMD
Acrylonitrile	U	U	ug/L	0.41	1.23	5030/8260C	09/27 05:15	09/27 05:15	MMD
Methyl Ethyl Ketone	U	U	ug/L	0.75	2.25	5030/8260C	09/27 05:15	09/27 05:15	MMD
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	5030/8260C	09/27 05:15	09/27 05:15	MMD
Chloromethane	U	U	ug/L	0.35	1.05	5030/8260C	09/27 05:15	09/27 05:15	MMD
Vinyl Chloride	U	U	ug/L	0.34	1.02	5030/8260C	09/27 05:15	09/27 05:15	MMD
Bromomethane	U	U	ug/L	0.41	1.23	5030/8260C	09/27 05:15	09/27 05:15	MMD
Chloroethane	U	U	ug/L	0.17	0.51	5030/8260C	09/27 05:15	09/27 05:15	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	5030/8260C	09/27 05:15	09/27 05:15	MMD

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1,1-Dichloroethene	U	U	ug/L	0.52	1.56	5030/8260C	09/27 05:15	09/27 05:15	MMD
Methylene Chloride	U	U	ug/L	0.99	2.97	5030/8260C	09/27 05:15	09/27 05:15	MMD
Trans-1,2-Dichloroethene	U	U	ug/L	0.50	1.50	5030/8260C	09/27 05:15	09/27 05:15	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	5030/8260C	09/27 05:15	09/27 05:15	MMD
,1-Dichloroethane	U	U	ug/L	0.53	1.59	5030/8260C	09/27 05:15	09/27 05:15	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	5030/8260C	09/27 05:15	09/27 05:15	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	5030/8260C	09/27 05:15	09/27 05:15	MMD
Chloroform	U	U	ug/L	0.80	2.40	5030/8260C	09/27 05:15	09/27 05:15	MMD
Bromochloromethane	U	U	ug/L	0.55	1.65	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	5030/8260C	09/27 05:15	09/27 05:15	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	5030/8260C	09/27 05:15	09/27 05:15	MMD
Benzene	U	U	ug/L	0.09	0.27	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	5030/8260C	09/27 05:15	09/27 05:15	MMD
Trichloroethene	U	U	ug/L	0.09	0.27	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	5030/8260C	09/27 05:15	09/27 05:15	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	5030/8260C	09/27 05:15	09/27 05:15	MMD
2-Chloroethylvinyl Ether	U	U	ug/L	1.00	3.00	5030/8260C	09/27 05:15	09/27 05:15	MMD

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Dibromomethane	U	U	ug/L	0.42	1.26	5030/8260C	09/27 05:15	09/27 05:15	MMD
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	5030/8260C	09/27 05:15	09/27 05:15	MMD
Toluene	U	U	ug/L	0.14	0.42	5030/8260C	09/27 05:15	09/27 05:15	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	5030/8260C	09/27 05:15	09/27 05:15	MMD
,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	5030/8260C	09/27 05:15	09/27 05:15	MMD
Tetrachloroethene	U	U	ug/L	0.11	0.33	5030/8260C	09/27 05:15	09/27 05:15	MMD
Dibromochloromethane	U	U	ug/L	0.39	1.17	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2-Dibromoethane (EDB)	U	U	ug/L	0.40	1.20	5030/8260C	09/27 05:15	09/27 05:15	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	5030/8260C	09/27 05:15	09/27 05:15	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	5030/8260C	09/27 05:15	09/27 05:15	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	5030/8260C	09/27 05:15	09/27 05:15	MMD
m & p-Xylene	2.52		ug/L	0.19	0.57	5030/8260C	09/27 05:15	09/27 05:15	MMD
o-Xylene	0.89		ug/L	0.19	0.57	5030/8260C	09/27 05:15	09/27 05:15	MMD
Styrene	U	U	ug/L	0.17	0.51	5030/8260C	09/27 05:15	09/27 05:15	MMD
Isopropylbenzene	U	U	ug/L	0.50	1.50	5030/8260C	09/27 05:15	09/27 05:15	MMD
Bromoform	U	U	ug/L	0.38	1.14	5030/8260C	09/27 05:15	09/27 05:15	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 10/23/06
Submission # 609000489
Order # 22957

Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,3,5-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	09/27 05:15	09/27 05:15	MMD
2-Chlorotoluene	U	U	ug/L	0.13	0.39	5030/8260C	09/27 05:15	09/27 05:15	MMD
4-Chlorotoluene	U	U	ug/L	0.16	0.48	5030/8260C	09/27 05:15	09/27 05:15	MMD
Tert-Butylbenzene	U	U	ug/L	0.16	0.48	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2,4-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	09/27 05:15	09/27 05:15	MMD
Sec-Butylbenzene	U	U	ug/L	0.17	0.51	5030/8260C	09/27 05:15	09/27 05:15	MMD
P-Isopropyltoluene	U	U	ug/L	0.11	0.33	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,3-Dichlorobenzene	U	U	ug/L	0.20	0.60	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	5030/8260C	09/27 05:15	09/27 05:15	MMD
n-Butylbenzene	U	U	ug/L	0.21	0.63	5030/8260C	09/27 05:15	09/27 05:15	MMD
n-PropylBenzene	U	U	ug/L	0.17	0.51	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.30	0.90	5030/8260C	09/27 05:15	09/27 05:15	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	5030/8260C	09/27 05:15	09/27 05:15	MMD
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	5030/8260C	09/27 05:15	09/27 05:15	MMD
Naphthalene	U	U	ug/L	0.015	0.045	5030/8260C	09/27 05:15	09/27 05:15	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 10/23/06
Submission # 609000489
Order # 22957

Project: Clewiston IW-1
Site Location: Clewiston, FL
Matrix: Drinking Water

Sample I.D.: IW-1 Injection Zone
Collected: 09/25/06 09:30
Received: 09/25/06 17:34
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,2,3-Trichlorobenzene	U	U	ug/L	1.27	3.81	5030/8260C	09/27 05:15	09/27 05:15	MMD
SUB 531.1 Carbamate Pesticides: 62-550.310(4)(b				**Dilution Factor =1**					
Carbofuran	0.5U		ug/L	0.5	1.5	531.1	09/30 18:47	09/30 18:47	E84129
Oxamyl (vydate)	0.5U		ug/L	0.5	1.5	531.1	09/30 18:47	09/30 18:47	E84129
phosate	10U		ug/L	10.0	30.0	547.1	09/27 19:45	09/27 19:45	E84129
Endothall	20U		ug/L	20.0	60.0	548.1	09/27 20:22	10/02 20:22	E84129
SUB 549.2 Diquat : 62-550.310(4)(b)				**Dilution Factor =1**					
Diquat	U	U	ug/L	1.00	3.00	549.2	09/27 21:05	09/27 21:05	E84129
Gross Alpha	6.1 ± 0.9		pCi/L	1.0	3.0	EPA 00-02	10/02 15:20	10/02 15:20	E84088
Radium-226	1.4 ± 0.1		pCi/L	0.10	0.30	EPA 903.1	10/10 16:30	10/10 16:30	E84088
Radium-228	0.5 ± 0.5U		pCi/L	0.50	1.50	EPA Ra-05	10/10 10:40	10/10 10:40	E84088

QC=Qualifier Codes as defined by DEP 62-160
Unless indicated, soil results are reported based on actual (wet) weight basis.
Analytes not currently NELAC certified denoted by *.
Work performed by outside (subcontract) labs denoted by Cert.ID in Analyst Field.
Results relate only to the sample.

Authorized CSM Signature
Florida Environmental;Certification # E86006

Florida Environmental

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/24/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Biochemical Oxygen Demand	U	U	mg/L	2.0	6.0	405.1	11/03 13:00	11/08 11:00	CRL
Coliform-Total (E-Coli)	P(A)		--------			9223B	11/03 10:45	11/04 10:45	DSM
Specific Conductance (Field)(grab)	20050		Ω*cm.	0.1	0.3	120.1	11/02 16:07	11/02 16:07	AP
pH (field)	8.2		units	0.1	0.3	150.1	11/02 16:07	11/02 16:07	AP
perature (Field)	23.2		Degree C	1	3	170.1	11/02 16:07	11/02 16:07	AP
Total Dissolved Solids (TDS)	13300		mg/L	1.00	3.00	EPA 160.1	11/06 13:50	11/06 13:50	EMS
Chloride	6900		mg/L	175.00	525.00	300.0	11/07 11:10	11/09 11:10	DGK
Fluoride	0.583		mg/L	0.046	0.138	300.0	11/07 11:21	11/09 11:21	DGK
Nitrate (as N)	U	U	mg/L	0.096	0.288	300.0	11/07 11:38	11/09 11:38	DGK
Nitrate+Nitrite (as N)	U	U	mg/L	0.022	0.066	300.0	11/07 11:44	11/09 11:44	DGK
Nitrite (as N)	U	U	mg/L	0.062	0.186	300.0	11/07 17:19	11/21 17:19	JRB
Sulfate	1040		mg/L	17.00	51.00	300.0	11/07 11:03	11/09 11:03	DGK
Cyanide, Total	U	U	mg/L	0.002	0.006	335.3	11/12 12:56	11/13 12:56	JRB
Nitrogen (Ammonia) as N	U	U	mg/L	0.1	0.3	350.1	11/08 09:12	11/09 09:12	JRB
Nitrogen (Kjeldahl) as "N"	0.311		mg/L	0.025	0.075	351.2	11/06 08:22	11/07 08:22	JRB
Nitrogen (Total Organic)	U	U	mg/L	0.041	0.123	351.2	11/06 08:22	11/07 08:22	JRB
Phosphate, Ortho	U	U	mg/L	0.12	0.36	365.2	11/03 12:52	11/03 12:52	EMS
Phosphorus, Total as "P"	0.258	I	mg/L	0.22	0.66	365.4	11/06 09:19	11/07 09:19	JRB

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
MBAS Surfactants (LAS Mol.Wt. 340)	U	U	mg/L	0.02	0.06	425.1	11/03 17:18	11/03 17:18	JRB
Odor (Lab)	1.00		TON	0.1	0.3	SM2150B	11/03 11:26	11/03 11:26	EMS
Color (Lab)	20.0		Pt-Co	1.0	3.0	SM2120B	11/03 11:28	11/03 11:28	EMS
Langelier Index (Corrosivity)(Water) (0	1.19					SM 2330B	11/07	11/07	EMS
.uminum	U	U	mg/L	0.004	0.012	200.7	11/03	11/03 17:02	IMN
Iron	0.52		mg/L	0.016	0.048	200.7	11/03	11/03 17:02	IMN
Sodium	3778		mg/L	20.000	60.000	200.7	11/03	11/06 11:58	IMN
Zinc	U	U	mg/L	0.00056	0.00168	200.7	11/03	11/03 17:02	IMN
200.8 DW-10 Metals in Drinking Water 62-550.310				**Dilution Factor =50**					
Arsenic	U	U	mg/L	0.00600	0.01800	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Barium	0.14		mg/L	0.0185	0.0555	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Cadmium	U	U	mg/L	0.02150	0.06450	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Chromium	U	U	mg/L	0.00400	0.01200	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Lead	U	U	mg/L	0.00050	0.00150	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Nickel	U	U	mg/L	0.01500	0.04500	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Selenium	U	U	mg/L	0.01500	0.04500	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Antimony	U	U	mg/L	0.02000	0.06000	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Beryllium	U	U	mg/L	0.01000	0.03000	4.1.3/200.8	11/07 09:00	11/07 14:07	EN

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Thallium	U	U	mg/L	0.00100	0.00300	4.1.3/200.8	11/07 09:00	11/07 14:07	EN
Copper	U	U	mg/L	0.02500	0.07500	200.8	11/07	11/07 14:07	EN
Manganese	0.10		mg/L	0.00500	0.01500	200.8	11/07	11/07 14:07	EN
Silver	U	U	mg/L	0.01000	0.03000	200.8	11/07	11/07 14:07	EN
ercury	U	U	mg/L	0.0002	0.0006	245.1	11/06	11/06 15:28	EN
504.1 EDB, DBCP: 62-550.310(4)(b)				**Dilution Factor =1**					
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.02	0.06	EPA 504.1 ECD	11/0707:00	11/07 17:53	RGC
Ethylene Dibromide (EDB)	U	U	ug/L	0.02	0.06	EPA 504.1 ECD	11/0707:00	11/07 17:53	RGC
508 Pesticides & PCBs: 62-550.310(4)(b)				**Dilution Factor =1**					
Hexachlorocyclopentdiene	U	U	ug/L	0.42	1.26	508	11/07 14:00	11/08 07:40	RGC
Hexachlorobenzene	U	U	ug/L	0.42	1.26	508	11/07 14:00	11/08 07:40	RGC
v-BHC (Lindane)	U	U	ug/L	0.004	0.012	508	11/07 14:00	11/08 07:40	RGC
Heptachlor	U	U	ug/L	0.005	0.015	508	11/07 14:00	11/08 07:40	RGC
Heptachlor Epoxide	U	U	ug/L	0.008	0.024	508	11/07 14:00	11/08 07:40	RGC
Endrin	U	U	ug/L	0.005	0.015	508	11/07 14:00	11/08 07:40	RGC
Methoxychlor	U	U	ug/L	0.007	0.021	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1016	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1221	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Arochlor 1232	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1242	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1248	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1254	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Arochlor 1260	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
Toxaphene	U	U	ug/L	0.40	1.20	508	11/07 14:00	11/08 07:40	RGC
Chordane	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 07:40	RGC
508 Pesticides 62-550.405 UNREGULATED				**Dilution Factor =1**					
Propachlor	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 07:40	RGC
Aldrin	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 07:40	RGC
Dieldrin	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 07:40	RGC
515.3 Chlorophenoxy Herbicides: 62-550.310(4)(b)				**Dilution Factor =1**					
Dalapon	U	U	ug/L	0.08	0.24	515.3	11/06 15:38	11/07 15:38	DKW
2,4-D	U	U	ug/L	0.09	0.27	515.3	11/06 15:38	11/07 15:38	DKW
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	11/06 15:38	11/07 15:38	DKW
2,4,5-TP (silvex)	U	U	ug/L	0.038	0.114	515.3	11/06 15:38	11/07 15:38	DKW
Dinoseb	U	U	ug/L	0.06	0.18	515.3	11/06 15:38	11/07 15:38	DKW
Picloram	U	U	ug/L	0.08	0.24	515.3	11/06 15:38	11/07 15:38	DKW

Report To:
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Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
524.2 Volatile Organics: 62-550.310(4)(a)				**Dilution Factor =1**					
Vinyl Chloride	U	U	ug/L	0.34	1.02	524.2	11/03 15:22	11/03 15:22	MMD
1,1-Dichloroethylene	U	U	ug/L	0.43	1.29	524.2	11/03 15:22	11/03 15:22	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	2.00	6.00	524.2	11/03 15:22	11/03 15:22	MMD
rans-1,2-Dichloroethylene	U	U	ug/L	0.50	1.50	524.2	11/03 15:22	11/03 15:22	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	11/03 15:22	11/03 15:22	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	524.2	11/03 15:22	11/03 15:22	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	524.2	11/03 15:22	11/03 15:22	MMD
Benzene	U	U	ug/L	0.09	0.27	524.2	11/03 15:22	11/03 15:22	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	524.2	11/03 15:22	11/03 15:22	MMD
Trichloroethylene	U	U	ug/L	0.09	0.27	524.2	11/03 15:22	11/03 15:22	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	524.2	11/03 15:22	11/03 15:22	MMD
Toluene	U	U	ug/L	0.14	0.42	524.2	11/03 15:22	11/03 15:22	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	11/03 15:22	11/03 15:22	MMD
Tetrachloroethylene	U	U	ug/L	0.11	0.33	524.2	11/03 15:22	11/03 15:22	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	524.2	11/03 15:22	11/03 15:22	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	524.2	11/03 15:22	11/03 15:22	MMD
Xylenes (Total)	U	U	ug/L	0.21	0.63	524.2	11/03 15:22	11/03 15:22	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Styrene	U	U	ug/L	0.17	0.51	524.2	11/03 15:22	11/03 15:22	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.14	0.42	524.2	11/03 15:22	11/03 15:22	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.48	1.44	524.2	11/03 15:22	11/03 15:22	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	524.2	11/03 15:22	11/03 15:22	MMD
.4.2 Volatile Organics: 62-550. UNREGULATED				Dilution Factor =1					
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	524.2	11/03 15:22	11/03 15:22	MMD
Chloromethane	U	U	ug/L	0.35	1.05	524.2	11/03 15:22	11/03 15:22	MMD
Bromomethane	U	U	ug/L	0.41	1.23	524.2	11/03 15:22	11/03 15:22	MMD
Chloroethane	U	U	ug/L	0.17	0.51	524.2	11/03 15:22	11/03 15:22	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	524.2	11/03 15:22	11/03 15:22	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	524.2	11/03 15:22	11/03 15:22	MMD
1,1-Dichloroethane	U	U	ug/L	0.53	1.59	524.2	11/03 15:22	11/03 15:22	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	524.2	11/03 15:22	11/03 15:22	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	524.2	11/03 15:22	11/03 15:22	MMD
Chloroform	U	U	ug/L	0.80	2.40	524.2	11/03 15:22	11/03 15:22	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	524.2	11/03 15:22	11/03 15:22	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	524.2	11/03 15:22	11/03 15:22	MMD
Dibromomethane	U	U	ug/L	0.42	1.26	524.2	11/03 15:22	11/03 15:22	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	524.2	11/03 15:22	11/03 15:22	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	524.2	11/03 15:22	11/03 15:22	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	11/03 15:22	11/03 15:22	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	524.2	11/03 15:22	11/03 15:22	MMD
)ibromochloromethane	U	U	ug/L	0.39	1.17	524.2	11/03 15:22	11/03 15:22	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	524.2	11/03 15:22	11/03 15:22	MMD
Bromoform	U	U	ug/L	0.38	1.14	524.2	11/03 15:22	11/03 15:22	MMD
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	524.2	11/03 15:22	11/03 15:22	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	524.2	11/03 15:22	11/03 15:22	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	524.2	11/03 15:22	11/03 15:22	MMD
2-Chlorotoluene (ortho)	U	U	ug/L	0.13	0.39	524.2	11/03 15:22	11/03 15:22	MMD
4-Chlorotoluene (para)	U	U	ug/L	0.16	0.48	524.2	11/03 15:22	11/03 15:22	MMD
1,3-Dichlorobenzene (meta)	U	U	ug/L	0.20	0.60	524.2	11/03 15:22	11/03 15:22	MMD
1,2-Dibromo-3-Chloropropane	U	U	ug/L	0.30	0.90	524.2	11/03 15:22	11/03 15:22	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				**Dilution Factor =1**					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.36	1.08	525.2	11/07 09:42	11/08 09:42	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.36	1.08	525.2	11/07 09:42	11/08 09:42	AC
Benzo(a)pyrene	U	U	ug/L	0.017	0.051	525.2	11/07 09:42	11/08 09:42	AC

Report To:
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Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	11/07 09:42	11/08 09:42	AC
Alachlor	U	U	ug/L	0.20	0.60	525.2	11/07 09:42	11/08 09:42	AC
Atrazine	U	U	ug/L	0.20	0.60	525.2	11/07 09:42	11/08 09:42	AC
Simazine	U	U	ug/L	0.20	0.60	525.2	11/07 09:42	11/08 09:42	AC
525.2 Semivolatile Organics: 62-550.UNREGULATED				Dilution Factor =1					
Butyl benzyl phthalate	U	U	ug/L	1.44	4.32	525.2	11/07 09:43	11/08 09:43	AC
Di-n-butylphthalate	U	U	ug/L	1.2	3.6	525.2	11/07 09:43	11/08 09:43	AC
Diethylphthalate	U	U	ug/L	3.4	10.2	525.2	11/07 09:43	11/08 09:43	AC
Dimethylphthalate	U	U	ug/L	3.7	11.1	525.2	11/07 09:43	11/08 09:43	AC
2,4-dinitrotoluene	U	U	ug/L	1.17	3.51	525.2	11/07 09:43	11/08 09:43	AC
Dioctylphthalate	U	U	ug/L	1.86	5.58	525.2	11/07 09:43	11/08 09:43	AC
Isophorone	U	U	ug/L	1.56	4.68	525.2	11/07 09:43	11/08 09:43	AC
(Dioxin) {Screen/Optional}	U	U	ug/L	0.03	0.09	525.2	11/07 09:43	11/08 09:43	AC
2-chlorophenol	U	U	ug/L	1.47	4.41	525.2	11/07 09:43	11/08 09:43	AC
2-methyl-4,6-dinitrophenol	U	U	ug/L	3.0	9.0	525.2	11/07 09:43	11/08 09:43	AC
Phenol	U	U	ug/L	1.86	5.58	525.2	11/07 09:43	11/08 09:43	AC
2,4,6-trichlorophenol	U	U	ug/L	3.0	9.0	525.2	11/07 09:43	11/08 09:43	AC
608 Chlorinated Pesticides & PCBs in WATER				Dilution Factor =1					

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Ft Myers, FL 33908

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
a-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 15:40	RGC
b-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 15:40	RGC
g-BHC (lindane)	U	QU	ug/L	0.004	0.012	EPA 608	11/14 12:00	11/15 15:40	RGC
d-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 15:40	RGC
Heptachlor	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 15:40	RGC
Aldrin	U	QU	ug/L	0.017	0.051	EPA 608	11/14 12:00	11/15 15:40	RGC
Heptachlor Epoxide	U	QU	ug/L	0.008	0.024	EPA 608	11/14 12:00	11/15 15:40	RGC
Endosulfan I	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 15:40	RGC
Dieldrin	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 15:40	RGC
4,4-DDE	U	QU	ug/L	0.39	1.17	EPA 608	11/14 12:00	11/15 15:40	RGC
Endrin	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 15:40	RGC
Endosulfan II	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 15:40	RGC
4,4-DDD	U	QU	ug/L	0.60	1.80	EPA 608	11/14 12:00	11/15 15:40	RGC
Endrin Aldehyde	U	QU	ug/L	0.010	0.030	EPA 608	11/14 12:00	11/15 15:40	RGC
Endosulfan Sulfate	U	QU	ug/L	0.007	0.021	EPA 608	11/14 12:00	11/15 15:40	RGC
4,4-DDT	U	QU	ug/L	0.69	2.07	EPA 608	11/14 12:00	11/15 15:40	RGC
Methoxychlor	U	QU	ug/L	0.007	0.021	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1016	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Aroclor 1221	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1232	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1242	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1248	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1254	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Aroclor 1260	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
Toxaphene	U	QU	ug/L	0.40	1.20	EPA 608	11/14 12:00	11/15 15:40	RGC
Chlordane	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 15:40	RGC
625 Semivolatile Organics in Water by GC/MS				Dilution Factor =1					
N-Nitrosodimethylamine	U	U	ug/L	0.50	1.50	625	11/07 09:39	11/07 09:39	AC
Phenol	U	U	ug/L	0.38	1.14	625	11/07 09:39	11/07 09:39	AC
Bis (2-Chloroethyl) Ether	U	U	ug/L	0.85	2.55	625	11/07 09:39	11/07 09:39	AC
2-Chlorophenol	U	U	ug/L	0.45	1.35	625	11/07 09:39	11/07 09:39	AC
1,3-Dichlorobenzene	U	U	ug/L	0.20	0.60	625	11/07 09:39	11/07 09:39	AC
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	625	11/07 09:39	11/07 09:39	AC
Benzyl Alcohol	U	U	ug/L	0.75	2.25	625	11/07 09:39	11/07 09:39	AC
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	625	11/07 09:39	11/07 09:39	AC
Bis (2-Chloroisopropyl) Ether *	U	U	ug/L	0.85	2.55	625	11/07 09:39	11/07 09:39	AC

Report To:
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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
N-Nitrosodi-N-Propylamine	U	U	ug/L	1.14	3.42	625	11/07 09:39	11/07 09:39	AC
Hexachloroethane	U	U	ug/L	2.31	6.93	625	11/07 09:39	11/07 09:39	AC
Nitrobenzene *	U	U	ug/L	0.66	1.98	625	11/07 09:39	11/07 09:39	AC
Isophorone	U	U	ug/L	1.56	4.68	625	11/07 09:39	11/07 09:39	AC
2-Nitrophenol	U	U	ug/L	1.09	3.27	625	11/07 09:39	11/07 09:39	AC
2,4-Dimethylphenol	U	U	ug/L	0.62	1.86	625	11/07 09:39	11/07 09:39	AC
Bis (2-Chloroethoxy)methane *	U	U	ug/L	1.89	5.67	625	11/07 09:39	11/07 09:39	AC
2,4-Dichlorophenol	U	U	ug/L	1.11	3.33	625	11/07 09:39	11/07 09:39	AC
1,2,3-Trichlorobenzene	U	U	ug/L	2.00	6.00	625	11/07 09:39	11/07 09:39	AC
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	625	11/07 09:39	11/07 09:39	AC
Naphthalene	U	U	ug/L	0.015	0.045	625	11/07 09:39	11/07 09:39	AC
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	625	11/07 09:39	11/07 09:39	AC
4-Chloro-3-Methylphenol	U	U	ug/L	0.67	2.01	625	11/07 09:39	11/07 09:39	AC
1-Methylnaphthalene	U	U	ug/L	0.36	1.08	625	11/07 09:39	11/07 09:39	AC
2-Methylnaphthalene	U	U	ug/L	0.024	0.072	625	11/07 09:39	11/07 09:39	AC
2-Methylphenol (o-cresol)	U	U	ug/L	1.0	3.0	625	11/07 09:39	11/07 09:39	AC
Hexachlorocyclopentadiene	U	U	ug/L	0.42	1.26	625	11/07 09:39	11/07 09:39	AC
3-MethylPhenol (m-cresol)	U	U	ug/L	0.84	2.52	625	11/07 09:39	11/07 09:39	AC

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
4-Methylphenol (p-cresol)	U	U	ug/L	1.16	3.48	625	11/07 09:39	11/07 09:39	AC
2,3,6-Trichlorophenol	U	U	ug/L	1.2	3.6	625	11/07 09:39	11/07 09:39	AC
2,4,5-Trichlorophenol	U	U	ug/L	0.81	2.43	625	11/07 09:39	11/07 09:39	AC
2,4,6-Trichlorophenol	U	U	ug/L	0.78	2.34	625	11/07 09:39	11/07 09:39	AC
2-Chloronaphthalene	U	U	ug/L	1.16	3.48	625	11/07 09:39	11/07 09:39	AC
Dimethyl Phthalate	U	U	ug/L	3.7	11.1	625	11/07 09:39	11/07 09:39	AC
Acenaphthylene	U	U	ug/L	0.015	0.045	625	11/07 09:39	11/07 09:39	AC
2,6-Dinitrotoluene	U	U	ug/L	0.54	1.62	625	11/07 09:39	11/07 09:39	AC
Acenaphthene	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
2,4-Dinitrophenol	U	U	ug/L	1.0	3.0	625	11/07 09:39	11/07 09:39	AC
2,4-Dinitrotoluene	U	U	ug/L	1.17	3.51	625	11/07 09:39	11/07 09:39	AC
4-Nitrophenol	U	U	ug/L	1.0	3.0	625	11/07 09:39	11/07 09:39	AC
Diethyl Phthalate	U	U	ug/L	3.4	10.2	625	11/07 09:39	11/07 09:39	AC
Fluorene	U	U	ug/L	0.012	0.036	625	11/07 09:39	11/07 09:39	AC
4-Chlorophenyl Phenyl Ether	U	U	ug/L	0.87	2.61	625	11/07 09:39	11/07 09:39	AC
4,6-Dinitro-2-Methylphenol	U	U	ug/L	1.4	4.2	625	11/07 09:39	11/07 09:39	AC
N-Nitrosodiphenylamine	U	U	ug/L	3.42	10.26	625	11/07 09:39	11/07 09:39	AC
4-Bromophenyl Phenyl Ether	U	U	ug/L	1.44	4.32	625	11/07 09:39	11/07 09:39	AC

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Hexachlorobenzene	U	U	ug/L	0.42	1.26	625	11/07 09:39	11/07 09:39	AC
Pentachlorophenol	U	U	ug/L	1.14	3.42	625	11/07 09:39	11/07 09:39	AC
Phenanthrene	U	U	ug/L	0.028	0.084	625	11/07 09:39	11/07 09:39	AC
Anthracene	U	U	ug/L	0.049	0.147	625	11/07 09:39	11/07 09:39	AC
Di-N-Butyl Phthalate	U	U	ug/L	1.2	3.6	625	11/07 09:39	11/07 09:39	AC
Fluoranthene	U	U	ug/L	0.025	0.075	625	11/07 09:39	11/07 09:39	AC
Benzidine *	U	U	ug/L	4.0	12.0	625	11/07 09:39	11/07 09:39	AC
Pyrene	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
Butyl Benzyl Phthalate	U	U	ug/L	1.44	4.32	625	11/07 09:39	11/07 09:39	AC
Benzo(A)Anthracene	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
3,3-Dichlorobenzidine	U	U	ug/L	2.0	6.0	625	11/07 09:39	11/07 09:39	AC
Chrysene	U	U	ug/L	0.75	2.25	625	11/07 09:39	11/07 09:39	AC
Bis (2 Ethylhexyl) Phthalate	U	U	ug/L	2.37	7.11	625	11/07 09:39	11/07 09:39	AC
Di-N-Octyl Phthalate	U	U	ug/L	1.4	4.2	625	11/07 09:39	11/07 09:39	AC
Benzo(B)Fluoranthene	U	U	ug/L	0.029	0.087	625	11/07 09:39	11/07 09:39	AC
Benzo(K)Fluoranthene	U	U	ug/L	0.025	0.075	625	11/07 09:39	11/07 09:39	AC
Benzo(A)Pyrene	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
Indeno(1,2,3-CD)Pyrene	U	U	ug/L	0.93	2.79	625	11/07 09:39	11/07 09:39	AC

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Dibenzo(A,H,)Anthracene	U	U	ug/L	0.029	0.087	625	11/07 09:39	11/07 09:39	AC
Benzo(G,H,I)Perylene	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
Bis-2-ethylhexyl Adipate	U	U	ug/L	0.36	1.08	625	11/07 09:39	11/07 09:39	AC
Aldrin *	U	U	ug/L	0.017	0.051	625	11/07 09:39	11/07 09:39	AC
alpha-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:39	11/07 09:39	AC
beta-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:39	11/07 09:39	AC
delta-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:39	11/07 09:39	AC
gamma-BHC (Lindane) *	U	U	ug/L	0.004	0.012	625	11/07 09:39	11/07 09:39	AC
Chlordane (Screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
4,4'-DDD *	U	U	ug/L	0.60	1.80	625	11/07 09:39	11/07 09:39	AC
4,4'-DDE *	U	U	ug/L	0.39	1.17	625	11/07 09:39	11/07 09:39	AC
4,4'-DDT *	U	U	ug/L	0.69	2.07	625	11/07 09:39	11/07 09:39	AC
Dieldrin *	U	U	ug/L	0.006	0.018	625	11/07 09:39	11/07 09:39	AC
Endosulfan I *	U	U	ug/L	0.006	0.018	625	11/07 09:39	11/07 09:39	AC
Endosulfan II *	U	U	ug/L	0.006	0.018	625	11/07 09:39	11/07 09:39	AC
Endosulfan Sulfate *	U	U	ug/L	0.007	0.021	625	11/07 09:39	11/07 09:39	AC
Endrin *	U	U	ug/L	0.005	0.015	625	11/07 09:39	11/07 09:39	AC
Endrin Aldehyde *	U	U	ug/L	0.010	0.030	625	11/07 09:39	11/07 09:39	AC

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Heptachlor *	U	U	ug/L	0.005	0.015	625	11/07 09:39	11/07 09:39	AC
Heptachlor Epoxide *	U	U	ug/L	0.008	0.024	625	11/07 09:39	11/07 09:39	AC
Toxaphene *	U	U	ug/L	0.40	1.20	625	11/07 09:39	11/07 09:39	AC
PCB-1016 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1221 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1232 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1242 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1248 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1254 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
PCB-1260 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:39	11/07 09:39	AC
Dioxin (screen)	U	U	ug/L	0.03	0.09	625	11/07 09:39	11/07 09:39	AC
Azobenzene *	U	U	ug/L	0.75	2.25	625	11/07 09:39	11/07 09:39	AC
Methoxychlor *	U	U	ug/L	0.007	0.021	625	11/07 09:39	11/07 09:39	AC
Benzoic Acid	U	U	ug/L	0.84	2.52	625	11/07 09:39	11/07 09:39	AC
Aniline	U	U	ug/L	0.50	1.50	625	11/07 09:39	11/07 09:39	AC
4-Chloroaniline	U	U	ug/L	0.65	1.95	625	11/07 09:39	11/07 09:39	AC
Dibenzofuran	U	U	ug/L	0.66	1.98	625	11/07 09:39	11/07 09:39	AC
2-Nitroaniline	U	U	ug/L	0.58	1.74	625	11/07 09:39	11/07 09:39	AC

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
3-Nitroaniline	U	U	ug/L	0.50	1.50	625	11/07 09:39	11/07 09:39	AC
4-Nitroaniline	U	U	ug/L	0.84	2.52	625	11/07 09:39	11/07 09:39	AC
Carbazole *	U	U	ug/L	0.68	2.04	625	11/07 09:39	11/07 09:39	AC
2,6-Dichlorophenol	U	U	ug/L	0.89	2.67	625	11/07 09:39	11/07 09:39	AC
Pyridine	U	U	ug/L	0.99	2.97	625	11/07 09:39	11/07 09:39	AC
2,3,4,6-Tetrachlorophenol	U	U	ug/L	1.00	3.00	625	11/07 09:39	11/07 09:39	AC
2,3,5,6-Tetrachlorophenol	U	U	ug/L	0.80	2.40	625	11/07 09:39	11/07 09:39	AC
8260.C Volatile Organics in Water by GC/MS				**Dilution Factor =1**					
Acetone	U	U	ug/L	1.75	5.25	5030/8260C	11/03 15:22	11/03 15:22	MMD
Acrolein	U	U	ug/L	0.75	2.25	5030/8260C	11/03 15:22	11/03 15:22	MMD
Acrylonitrile	U	U	ug/L	0.41	1.23	5030/8260C	11/03 15:22	11/03 15:22	MMD
Methyl Ethyl Ketone	U	U	ug/L	0.75	2.25	5030/8260C	11/03 15:22	11/03 15:22	MMD
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:22	11/03 15:22	MMD
Chloromethane	U	U	ug/L	0.35	1.05	5030/8260C	11/03 15:22	11/03 15:22	MMD
Vinyl Chloride	U	U	ug/L	0.34	1.02	5030/8260C	11/03 15:22	11/03 15:22	MMD
Bromomethane	U	U	ug/L	0.41	1.23	5030/8260C	11/03 15:22	11/03 15:22	MMD
Chloroethane	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:22	11/03 15:22	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	5030/8260C	11/03 15:22	11/03 15:22	MMD

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Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,1-Dichloroethene	U	U	ug/L	0.52	1.56	5030/8260C	11/03 15:22	11/03 15:22	MMD
Methylene Chloride	U	U	ug/L	0.99	2.97	5030/8260C	11/03 15:22	11/03 15:22	MMD
Trans-1,2-Dichloroethene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:22	11/03 15:22	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,1-Dichloroethane	U	U	ug/L	0.53	1.59	5030/8260C	11/03 15:22	11/03 15:22	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	5030/8260C	11/03 15:22	11/03 15:22	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:22	11/03 15:22	MMD
Chloroform	U	U	ug/L	0.80	2.40	5030/8260C	11/03 15:22	11/03 15:22	MMD
Bromochloromethane	U	U	ug/L	0.55	1.65	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	5030/8260C	11/03 15:22	11/03 15:22	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:22	11/03 15:22	MMD
Benzene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	5030/8260C	11/03 15:22	11/03 15:22	MMD
Trichloroethene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	5030/8260C	11/03 15:22	11/03 15:22	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	5030/8260C	11/03 15:22	11/03 15:22	MMD
2-Chloroethylvinyl Ether	U	U	ug/L	1.00	3.00	5030/8260C	11/03 15:22	11/03 15:22	MMD

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Report Printed: 11/22/06
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Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Dibromomethane	U	U	ug/L	0.42	1.26	5030/8260C	11/03 15:22	11/03 15:22	MMD
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:22	11/03 15:22	MMD
Toluene	U	U	ug/L	0.14	0.42	5030/8260C	11/03 15:22	11/03 15:22	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:22	11/03 15:22	MMD
Tetrachloroethene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:22	11/03 15:22	MMD
Dibromochloromethane	U	U	ug/L	0.39	1.17	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2-Dibromoethane (EDB)	U	U	ug/L	0.40	1.20	5030/8260C	11/03 15:22	11/03 15:22	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	5030/8260C	11/03 15:22	11/03 15:22	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:22	11/03 15:22	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	5030/8260C	11/03 15:22	11/03 15:22	MMD
m & p-Xylene	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:22	11/03 15:22	MMD
o-Xylene	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:22	11/03 15:22	MMD
Styrene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:22	11/03 15:22	MMD
Isopropylbenzene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:22	11/03 15:22	MMD
Bromoform	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:22	11/03 15:22	MMD

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Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,3,5-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:22	11/03 15:22	MMD
2-Chlorotoluene	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:22	11/03 15:22	MMD
4-Chlorotoluene	U	U	ug/L	0.16	0.48	5030/8260C	11/03 15:22	11/03 15:22	MMD
Tert-Butylbenzene	U	U	ug/L	0.16	0.48	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2,4-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:22	11/03 15:22	MMD
Sec-Butylbenzene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:22	11/03 15:22	MMD
P-Isopropyltoluene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,3-Dichlorobenzene	U	U	ug/L	0.20	0.60	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	5030/8260C	11/03 15:22	11/03 15:22	MMD
n-Butylbenzene	U	U	ug/L	0.21	0.63	5030/8260C	11/03 15:22	11/03 15:22	MMD
n-PropylBenzene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.30	0.90	5030/8260C	11/03 15:22	11/03 15:22	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	5030/8260C	11/03 15:22	11/03 15:22	MMD
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	5030/8260C	11/03 15:22	11/03 15:22	MMD
Naphthalene	U	U	ug/L	0.015	0.045	5030/8260C	11/03 15:22	11/03 15:22	MMD

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,2,3-Trichlorobenzene	U	U	ug/L	1.27	3.81	5030/8260C	11/03 15:22	11/03 15:22	MMD
SUB 531 Carbamate Pesticides: 62-550.310(4)(b				**Dilution Factor =1**					
Carbofuran	U	U	ug/L	0.45	1.35	531.1	11/15 00:09	11/15 00:09	E83079
Oxamyl (vydate)	U	U	ug/L	0.52	1.56	531.1	11/15 00:09	11/15 00:09	E83079
SUB 531 Carbamate Pesticides: 62-550.UNREGULA				**Dilution Factor =1**					
Aldicarb Sulfoxide	U	U	ug/L	0.48	1.44	531.1	11/15 00:09	11/15 00:09	E83079
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	11/15 00:09	11/15 00:09	E83079
Methomyl	U	U	ug/L	0.72	2.16	531.1	11/15 00:09	11/15 00:09	E83079
3-Hydrocarbofuran	U	U	ug/L	0.87	2.61	531.1	11/15 00:09	11/15 00:09	E83079
Aldicarb	U	U	ug/L	0.31	0.93	531.1	11/15 00:09	11/15 00:09	E83079
Carbaryl	U	U	ug/L	0.72	2.16	531.1	11/15 00:09	11/15 00:09	E83079
Glyphosate	U	U	ug/L	3.2	9.6	547.1	11/08 01:18	11/09 01:18	E83079
Endothall	U	U	ug/L	2.7	8.1	548.1	11/09 02:25	11/11 02:25	E83079
SUB 549 Diquat : 62-550.310(4)(b)				**Dilution Factor =1**					
Diquat	U	U	ug/L	0.29	0.87	549.2	11/09 18:37	11/09 18:37	E83079
Gross Alpha	4.5 ± 0.8		pCi/L	1.0	3.0	EPA 00-02	11/09 17:45	11/09 17:45	E84088
Radium-226	2.6 ± 0.1		pCi/L	0.10	0.30	EPA 903.1	11/12 13:43	11/12 13:43	E84088

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Report Printed: 11/22/06
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Order # 27183

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Upper 1950'- 2000'
Collected: 11/02/06 16:07
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Radium-228	0.5 ± 0.5		pCi/L	0.50	1.50	EPA Ra-05	11/09 15:28	11/09 15:28	E84088

QC=Qualifier Codes as defined by DEP 62-160
Unless indicated, soil results are reported based on actual (wet) weight basis.
Analytes not currently NELAC certified denoted by *.
k performed by outside (subcontract) labs denoted by Cert.ID in Analyst Field.
lts relate only to the sample.

Authorized CSM Signature
Florida Environmental;Certification # E86006

Report To:
Edward McCullers
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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Biochemical Oxygen Demand	U	U	mg/L	2.0	6.0	405.1	11/03 13:00	11/08 11:00	CRL
Coliform-Total (E-Coli)	P(A)		--------			9223B	11/03 10:45	11/04 10:45	DSM
Specific Conductance (Field)(grab)	44600		Ω*cm.	0.1	0.3	120.1	11/02 16:30	11/02 16:30	AP
pH (field)	7.4		units	0.1	0.3	150.1	11/02 16:30	11/02 16:30	AP
emperature (Field)	23.6		Degree C	1	3	170.1	11/02 16:30	11/02 16:30	AP
Total Dissolved Solids (TDS)	33800		mg/L	1.00	3.00	EPA 160.1	11/06 13:50	11/06 13:50	EMS
Chloride	17600		mg/L	350	1050	300.0	11/07 11:10	11/09 11:10	DGK
Fluoride	0.482		mg/L	0.046	0.138	300.0	11/07 11:22	11/09 11:22	DGK
Nitrate (as N)	U	U	mg/L	0.096	0.288	300.0	11/07 11:39	11/09 11:39	DGK
Nitrate+Nitrite (as N)	U	U	mg/L	0.022	0.066	300.0	11/07 11:45	11/09 11:45	DGK
Nitrite (as N)	U	U	mg/L	0.062	0.186	300.0	11/07 17:20	11/21 17:20	JRB
Sulfate	2440		mg/L	34.00	102.00	300.0	11/07 11:03	11/09 11:03	DGK
Cyanide, Total	U	U	mg/L	0.002	0.006	335.3	11/12 12:56	11/13 12:56	JRB
Nitrogen (Ammonia) as N	U	U	mg/L	0.1	0.3	350.1	11/08 09:12	11/09 09:12	JRB
Nitrogen (Kjeldahl) as "N"	0.153		mg/L	0.025	0.075	351.2	11/06 08:30	11/07 08:30	JRB
Nitrogen (Total Organic)	.153		mg/L	0.041	0.123	351.2	11/21 16:33	11/21 16:33	JRB
Phosphate, Ortho	U	U	mg/L	0.12	0.36	365.2	11/03 12:52	11/03 12:52	EMS
Phosphorus, Total as "P"	0.227	I	mg/L	0.22	0.66	365.4	11/06 09:19	11/07 09:19	JRB

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Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
MBAS Surfactants (LAS Mol.Wt. 340)	U	U	mg/L	0.02	0.06	425.1	11/03 17:18	11/03 17:18	JRB
Odor (Lab)	1.5		TON	0.1	0.3	SM2150B	11/03 11:26	11/03 11:26	EMS
Color (Lab)	35.0		Pt-Co	1.0	3.0	SM2120B	11/03 11:28	11/03 11:28	EMS
Langelier Index (Corrosivity)(Water) (0	1.01					SM 2330B	11/07	11/07	EMS
luminum	U	U	mg/L	0.004	0.012	200.7	11/03	11/03 17:07	IMN
Iron	0.45		mg/L	0.016	0.048	200.7	11/03	11/03 17:07	IMN
Sodium	10654		mg/L	20.000	60.000	200.7	11/03	11/06 12:04	IMN
Zinc	U	U	mg/L	0.00056	0.00168	200.7	11/03	11/03 17:07	IMN
200.8 DW-10 Metals in Drinking Water 62-550.310				**Dilution Factor =1**					
Arsenic	U	U	mg/L	0.00012	0.00036	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Barium	0.32		mg/L	0.0004	0.0012	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Cadmium	U	U	mg/L	0.00043	0.00129	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Chromium	U	U	mg/L	0.00008	0.00024	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Lead	U	U	mg/L	0.00001	0.00003	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Nickel	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Selenium	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Antimony	U	U	mg/L	0.00040	0.00120	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Beryllium	U	U	mg/L	0.00020	0.00060	4.1.3/200.8	11/07 09:00	11/07 14:13	EN

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Thallium	U	U	mg/L	0.00002	0.00006	4.1.3/200.8	11/07 09:00	11/07 14:13	EN
Copper	U	U	mg/L	0.02500	0.07500	200.8	11/07	11/07 14:13	EN
Manganese	0.22		mg/L	0.00500	0.01500	200.8	11/07	11/07 14:13	EN
Silver	U	U	mg/L	0.01000	0.03000	200.8	11/07	11/07 14:13	EN
Mercury	U	U	mg/L	0.0002	0.0006	245.1	11/06	11/06 15:30	EN
504.1 EDB, DBCP: 62-550.310(4)(b)				Dilution Factor =1					
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.02	0.06	EPA 504.1 ECD	11/0707:00	11/07 18:02	RGC
Ethylene Dibromide (EDB)	U	U	ug/L	0.02	0.06	EPA 504.1 ECD	11/0707:00	11/07 18:02	RGC
508 Pesticides & PCBs: 62-550.310(4)(b)				Dilution Factor =1					
Hexachlorocyclopentdiene	U	U	ug/L	0.42	1.26	508	11/07 14:00	11/08 08:21	RGC
Hexachlorobenzene	U	U	ug/L	0.42	1.26	508	11/07 14:00	11/08 08:21	RGC
v-BHC (Lindane)	U	U	ug/L	0.004	0.012	508	11/07 14:00	11/08 08:21	RGC
Heptachlor	U	U	ug/L	0.005	0.015	508	11/07 14:00	11/08 08:21	RGC
Heptachlor Epoxide	U	U	ug/L	0.008	0.024	508	11/07 14:00	11/08 08:21	RGC
Endrin	U	U	ug/L	0.005	0.015	508	11/07 14:00	11/08 08:21	RGC
Methoxychlor	U	U	ug/L	0.007	0.021	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1016	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1221	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Arochlor 1232	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1242	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1248	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1254	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Arochlor 1260	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
Toxaphene	U	U	ug/L	0.40	1.20	508	11/07 14:00	11/08 08:21	RGC
Chordane	U	U	ug/L	0.10	0.30	508	11/07 14:00	11/08 08:21	RGC
508 Pesticides 62-550.405 UNREGULATED				**Dilution Factor =1**					
Propachlor	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 08:21	RGC
Aldrin	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 08:21	RGC
Dieldrin	U	U	ug/L	0.03	0.09	508	11/07 12:00	11/08 08:21	RGC
515.3 Chlorophenoxy Herbicides: 62-550.310(4)(b)				**Dilution Factor =1**					
Dalapon	U	U	ug/L	0.08	0.24	515.3	11/06 15:39	11/07 15:39	DKW
2,4-D	U	U	ug/L	0.09	0.27	515.3	11/06 15:39	11/07 15:39	DKW
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	11/06 15:39	11/07 15:39	DKW
2,4,5-TP (silvex)	U	U	ug/L	0.038	0.114	515.3	11/06 15:39	11/07 15:39	DKW
Dinoseb	U	U	ug/L	0.06	0.18	515.3	11/06 15:39	11/07 15:39	DKW
Picloram	U	U	ug/L	0.08	0.24	515.3	11/06 15:39	11/07 15:39	DKW

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Site Location: Clewiston, Fl
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Collected: 11/02/06 16:30
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
524.2 Volatile Organics: 62-550.310(4)(a)				Dilution Factor =1					
Vinyl Chloride	U	U	ug/L	0.34	1.02	524.2	11/03 15:52	11/03 15:52	MMD
1,1-Dichloroethylene	U	U	ug/L	0.43	1.29	524.2	11/03 15:52	11/03 15:52	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	2.00	6.00	524.2	11/03 15:52	11/03 15:52	MMD
rans-1,2-Dichloroethylene	U	U	ug/L	0.50	1.50	524.2	11/03 15:52	11/03 15:52	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	11/03 15:52	11/03 15:52	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	524.2	11/03 15:52	11/03 15:52	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	524.2	11/03 15:52	11/03 15:52	MMD
Benzene	U	U	ug/L	0.09	0.27	524.2	11/03 15:52	11/03 15:52	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	524.2	11/03 15:52	11/03 15:52	MMD
Trichloroethylene	U	U	ug/L	0.09	0.27	524.2	11/03 15:52	11/03 15:52	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	524.2	11/03 15:52	11/03 15:52	MMD
Toluene	U	U	ug/L	0.14	0.42	524.2	11/03 15:52	11/03 15:52	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	11/03 15:52	11/03 15:52	MMD
Tetrachloroethylene	U	U	ug/L	0.11	0.33	524.2	11/03 15:52	11/03 15:52	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	524.2	11/03 15:52	11/03 15:52	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	524.2	11/03 15:52	11/03 15:52	MMD
Xylenes (Total)	U	U	ug/L	0.21	0.63	524.2	11/03 15:52	11/03 15:52	MMD

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Styrene	U	U	ug/L	0.17	0.51	524.2	11/03 15:52	11/03 15:52	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.14	0.42	524.2	11/03 15:52	11/03 15:52	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.48	1.44	524.2	11/03 15:52	11/03 15:52	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	524.2	11/03 15:52	11/03 15:52	MMD
524.2 Volatile Organics: 62-550. UNREGULATED				Dilution Factor =1					
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	524.2	11/03 15:52	11/03 15:52	MMD
Chloromethane	U	U	ug/L	0.35	1.05	524.2	11/03 15:52	11/03 15:52	MMD
Bromomethane	U	U	ug/L	0.41	1.23	524.2	11/03 15:52	11/03 15:52	MMD
Chloroethane	U	U	ug/L	0.17	0.51	524.2	11/03 15:52	11/03 15:52	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	524.2	11/03 15:52	11/03 15:52	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	524.2	11/03 15:52	11/03 15:52	MMD
1,1-Dichloroethane	U	U	ug/L	0.53	1.59	524.2	11/03 15:52	11/03 15:52	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	524.2	11/03 15:52	11/03 15:52	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	524.2	11/03 15:52	11/03 15:52	MMD
Chloroform	U	U	ug/L	0.80	2.40	524.2	11/03 15:52	11/03 15:52	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	524.2	11/03 15:52	11/03 15:52	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	524.2	11/03 15:52	11/03 15:52	MMD
Dibromomethane	U	U	ug/L	0.42	1.26	524.2	11/03 15:52	11/03 15:52	MMD

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Report Printed: 11/22/06
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Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	524.2	11/03 15:52	11/03 15:52	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	524.2	11/03 15:52	11/03 15:52	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	524.2	11/03 15:52	11/03 15:52	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	524.2	11/03 15:52	11/03 15:52	MMD
Dibromochloromethane	U	U	ug/L	0.39	1.17	524.2	11/03 15:52	11/03 15:52	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	524.2	11/03 15:52	11/03 15:52	MMD
Bromoform	U	U	ug/L	0.38	1.14	524.2	11/03 15:52	11/03 15:52	MMD
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	524.2	11/03 15:52	11/03 15:52	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	524.2	11/03 15:52	11/03 15:52	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	524.2	11/03 15:52	11/03 15:52	MMD
2-Chlorotoluene (ortho)	U	U	ug/L	0.13	0.39	524.2	11/03 15:52	11/03 15:52	MMD
4-Chlorotoluene (para)	U	U	ug/L	0.16	0.48	524.2	11/03 15:52	11/03 15:52	MMD
1,3-Dichlorobenzene (meta)	U	U	ug/L	0.20	0.60	524.2	11/03 15:52	11/03 15:52	MMD
1,2-Dibromo-3-Chloropropane	U	U	ug/L	0.30	0.90	524.2	11/03 15:52	11/03 15:52	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				**Dilution Factor =1**					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.36	1.08	525.2	11/07 09:43	11/08 09:43	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.36	1.08	525.2	11/07 09:43	11/08 09:43	AC
Benzo(a)pyrene	U	U	ug/L	0.017	0.051	525.2	11/07 09:43	11/08 09:43	AC

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	11/07 09:43	11/08 09:43	AC
Alachlor	U	U	ug/L	0.20	0.60	525.2	11/07 09:43	11/08 09:43	AC
Atrazine	U	U	ug/L	0.20	0.60	525.2	11/07 09:43	11/08 09:43	AC
Simazine	U	U	ug/L	0.20	0.60	525.2	11/07 09:43	11/08 09:43	AC
525.2 Semivolatile Organics: 62-550.UNREGULATED				Dilution Factor =1					
Butyl benzyl phthalate	U	U	ug/L	1.44	4.32	525.2	11/07 09:44	11/08 09:44	AC
Di-n-butylphthalate	U	U	ug/L	1.2	3.6	525.2	11/07 09:44	11/08 09:44	AC
Diethylphthalate	U	U	ug/L	3.4	10.2	525.2	11/07 09:44	11/08 09:44	AC
Dimethylphthalate	U	U	ug/L	3.7	11.1	525.2	11/07 09:44	11/08 09:44	AC
2,4-dinitrotoluene	U	U	ug/L	1.17	3.51	525.2	11/07 09:44	11/08 09:44	AC
Dioctylphthalate	U	U	ug/L	1.86	5.58	525.2	11/07 09:44	11/08 09:44	AC
Isophorone	U	U	ug/L	1.56	4.68	525.2	11/07 09:44	11/08 09:44	AC
(Dioxin) {Screen/Optional}	U	U	ug/L	0.03	0.09	525.2	11/07 09:44	11/08 09:44	AC
2-chlorophenol	U	U	ug/L	1.47	4.41	525.2	11/07 09:44	11/08 09:44	AC
2-methyl-4,6-dinitrophenol	U	U	ug/L	3.0	9.0	525.2	11/07 09:44	11/08 09:44	AC
Phenol	U	U	ug/L	1.86	5.58	525.2	11/07 09:44	11/08 09:44	AC
2,4,6-trichlorophenol	U	U	ug/L	3.0	9.0	525.2	11/07 09:44	11/08 09:44	AC
608 Chlorinated Pesticides & PCBs in WATER				Dilution Factor =1					

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
a-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 16:21	RGC
b-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 16:21	RGC
g-BHC (lindane)	U	QU	ug/L	0.004	0.012	EPA 608	11/14 12:00	11/15 16:21	RGC
d-BHC	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 16:21	RGC
Heptachlor	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 16:21	RGC
Aldrin	U	QU	ug/L	0.017	0.051	EPA 608	11/14 12:00	11/15 16:21	RGC
Heptachlor Epoxide	U	QU	ug/L	0.008	0.024	EPA 608	11/14 12:00	11/15 16:21	RGC
Endosulfan I	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 16:21	RGC
Dieldrin	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 16:21	RGC
4,4-DDE	U	QU	ug/L	0.39	1.17	EPA 608	11/14 12:00	11/15 16:21	RGC
Endrin	U	QU	ug/L	0.005	0.015	EPA 608	11/14 12:00	11/15 16:21	RGC
Endosulfan II	U	QU	ug/L	0.006	0.018	EPA 608	11/14 12:00	11/15 16:21	RGC
4,4-DDD	U	QU	ug/L	0.60	1.80	EPA 608	11/14 12:00	11/15 16:21	RGC
Endrin Aldehyde	U	QU	ug/L	0.010	0.030	EPA 608	11/14 12:00	11/15 16:21	RGC
Endosulfan Sulfate	U	QU	ug/L	0.007	0.021	EPA 608	11/14 12:00	11/15 16:21	RGC
4,4-DDT	U	QU	ug/L	0.69	2.07	EPA 608	11/14 12:00	11/15 16:21	RGC
Methoxychlor	U	QU	ug/L	0.007	0.021	EPA 608	11/14 12:00	11/15 16:21	RGC
Aroclor 1016	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC

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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
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LABORATORY ANALYSIS REPORT

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Aroclor 1221	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
Aroclor 1232	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
Aroclor 1242	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
Aroclor 1248	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
.roclor 1254	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
Aroclor 1260	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
Toxaphene	U	QU	ug/L	0.40	1.20	EPA 608	11/14 12:00	11/15 16:21	RGC
Chlordane	U	QU	ug/L	0.10	0.30	EPA 608	11/14 12:00	11/15 16:21	RGC
625 Semivolatile Organics in Water by GC/MS				Dilution Factor =1					
N-Nitrosodimethylamine	U	U	ug/L	0.50	1.50	625	11/07 09:40	11/07 09:40	AC
Phenol	U	U	ug/L	0.38	1.14	625	11/07 09:40	11/07 09:40	AC
Bis (2-Chloroethyl) Ether	U	U	ug/L	0.85	2.55	625	11/07 09:40	11/07 09:40	AC
2-Chlorophenol	U	U	ug/L	0.45	1.35	625	11/07 09:40	11/07 09:40	AC
1,3-Dichlorobenzene	U	U	ug/L	0.20	0.60	625	11/07 09:40	11/07 09:40	AC
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	625	11/07 09:40	11/07 09:40	AC
Benzyl Alcohol	U	U	ug/L	0.75	2.25	625	11/07 09:40	11/07 09:40	AC
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	625	11/07 09:40	11/07 09:40	AC
Bis (2-Chloroisopropyl) Ether *	U	U	ug/L	0.85	2.55	625	11/07 09:40	11/07 09:40	AC

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
N-Nitrosodi-N-Propylamine	U	U	ug/L	1.14	3.42	625	11/07 09:40	11/07 09:40	AC
Hexachloroethane	U	U	ug/L	2.31	6.93	625	11/07 09:40	11/07 09:40	AC
Nitrobenzene *	U	U	ug/L	0.66	1.98	625	11/07 09:40	11/07 09:40	AC
Isophorone	U	U	ug/L	1.56	4.68	625	11/07 09:40	11/07 09:40	AC
2-Nitrophenol	U	U	ug/L	1.09	3.27	625	11/07 09:40	11/07 09:40	AC
2,4-Dimethylphenol	U	U	ug/L	0.62	1.86	625	11/07 09:40	11/07 09:40	AC
Bis (2-Chloroethoxy)methane *	U	U	ug/L	1.89	5.67	625	11/07 09:40	11/07 09:40	AC
2,4-Dichlorophenol	U	U	ug/L	1.11	3.33	625	11/07 09:40	11/07 09:40	AC
1,2,3-Trichlorobenzene	U	U	ug/L	2.00	6.00	625	11/07 09:40	11/07 09:40	AC
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	625	11/07 09:40	11/07 09:40	AC
Naphthalene	U	U	ug/L	0.015	0.045	625	11/07 09:40	11/07 09:40	AC
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	625	11/07 09:40	11/07 09:40	AC
4-Chloro-3-Methylphenol	U	U	ug/L	0.67	2.01	625	11/07 09:40	11/07 09:40	AC
1-Methylnaphthalene	U	U	ug/L	0.36	1.08	625	11/07 09:40	11/07 09:40	AC
2-Methylnaphthalene	U	U	ug/L	0.024	0.072	625	11/07 09:40	11/07 09:40	AC
2-Methylphenol (o-cresol)	U	U	ug/L	1.0	3.0	625	11/07 09:40	11/07 09:40	AC
Hexachlorocyclopentadiene	U	U	ug/L	0.42	1.26	625	11/07 09:40	11/07 09:40	AC
3-MethylPhenol (m-cresol)	U	U	ug/L	0.84	2.52	625	11/07 09:40	11/07 09:40	AC

Report To:
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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
4-Methylphenol (p-cresol)	U	U	ug/L	1.16	3.48	625	11/07 09:40	11/07 09:40	AC
2,3,6-Trichlorophenol	U	U	ug/L	1.2	3.6	625	11/07 09:40	11/07 09:40	AC
2,4,5-Trichlorophenol	U	U	ug/L	0.81	2.43	625	11/07 09:40	11/07 09:40	AC
2,4,6-Trichlorophenol	U	U	ug/L	0.78	2.34	625	11/07 09:40	11/07 09:40	AC
2-Chloronaphthalene	U	U	ug/L	1.16	3.48	625	11/07 09:40	11/07 09:40	AC
Dimethyl Phthalate	U	U	ug/L	3.7	11.1	625	11/07 09:40	11/07 09:40	AC
Acenaphthylene	U	U	ug/L	0.015	0.045	625	11/07 09:40	11/07 09:40	AC
2,6-Dinitrotoluene	U	U	ug/L	0.54	1.62	625	11/07 09:40	11/07 09:40	AC
Acenaphthene	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
2,4-Dinitrophenol	U	U	ug/L	1.0	3.0	625	11/07 09:40	11/07 09:40	AC
2,4-Dinitrotoluene	U	U	ug/L	1.17	3.51	625	11/07 09:40	11/07 09:40	AC
4-Nitrophenol	U	U	ug/L	1.0	3.0	625	11/07 09:40	11/07 09:40	AC
Diethyl Phthalate	U	U	ug/L	3.4	10.2	625	11/07 09:40	11/07 09:40	AC
Fluorene	U	U	ug/L	0.012	0.036	625	11/07 09:40	11/07 09:40	AC
4-Chlorophenyl Phenyl Ether	U	U	ug/L	0.87	2.61	625	11/07 09:40	11/07 09:40	AC
4,6-Dinitro-2-Methylphenol	U	U	ug/L	1.4	4.2	625	11/07 09:40	11/07 09:40	AC
N-Nitrosodiphenylamine	U	U	ug/L	3.42	10.26	625	11/07 09:40	11/07 09:40	AC
4-Bromophenyl Phenyl Ether	U	U	ug/L	1.44	4.32	625	11/07 09:40	11/07 09:40	AC

Report To:
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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Hexachlorobenzene	U	U	ug/L	0.42	1.26	625	11/07 09:40	11/07 09:40	AC
Pentachlorophenol	U	U	ug/L	1.14	3.42	625	11/07 09:40	11/07 09:40	AC
Phenanthrene	U	U	ug/L	0.028	0.084	625	11/07 09:40	11/07 09:40	AC
Anthracene	U	U	ug/L	0.049	0.147	625	11/07 09:40	11/07 09:40	AC
Di-N-Butyl Phthalate	U	U	ug/L	1.2	3.6	625	11/07 09:40	11/07 09:40	AC
Fluoranthene	U	U	ug/L	0.025	0.075	625	11/07 09:40	11/07 09:40	AC
Benzidine *	U	U	ug/L	4.0	12.0	625	11/07 09:40	11/07 09:40	AC
Pyrene	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
Butyl Benzyl Phthalate	U	U	ug/L	1.44	4.32	625	11/07 09:40	11/07 09:40	AC
Benzo(A)Anthracene	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
3,3-Dichlorobenzidine	U	U	ug/L	2.0	6.0	625	11/07 09:40	11/07 09:40	AC
Chrysene	U	U	ug/L	0.75	2.25	625	11/07 09:40	11/07 09:40	AC
Bis (2 Ethylhexyl) Phthalate	U	U	ug/L	2.37	7.11	625	11/07 09:40	11/07 09:40	AC
Di-N-Octyl Phthalate	U	U	ug/L	1.4	4.2	625	11/07 09:40	11/07 09:40	AC
Benzo(B)Fluoranthene	U	U	ug/L	0.029	0.087	625	11/07 09:40	11/07 09:40	AC
Benzo(K)Fluoranthene	U	U	ug/L	0.025	0.075	625	11/07 09:40	11/07 09:40	AC
Benzo(A)Pyrene	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
Indeno(1,2,3-CD)Pyrene	U	U	ug/L	0.93	2.79	625	11/07 09:40	11/07 09:40	AC

Report To:
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15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Dibenzo(A,H,)Anthracene	U	U	ug/L	0.029	0.087	625	11/07 09:40	11/07 09:40	AC
Benzo(G,H,I)Perylene	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
Bis-2-ethylhexyl Adipate	U	U	ug/L	0.36	1.08	625	11/07 09:40	11/07 09:40	AC
Aldrin *	U	U	ug/L	0.017	0.051	625	11/07 09:40	11/07 09:40	AC
lpha-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:40	11/07 09:40	AC
beta-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:40	11/07 09:40	AC
delta-BHC *	U	U	ug/L	0.005	0.015	625	11/07 09:40	11/07 09:40	AC
gamma-BHC (Lindane) *	U	U	ug/L	0.004	0.012	625	11/07 09:40	11/07 09:40	AC
Chlordane (Screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
4,4'-DDD *	U	U	ug/L	0.60	1.80	625	11/07 09:40	11/07 09:40	AC
4,4'-DDE *	U	U	ug/L	0.39	1.17	625	11/07 09:40	11/07 09:40	AC
4,4'-DDT *	U	U	ug/L	0.69	2.07	625	11/07 09:40	11/07 09:40	AC
Dieldrin *	U	U	ug/L	0.006	0.018	625	11/07 09:40	11/07 09:40	AC
Endosulfan I *	U	U	ug/L	0.006	0.018	625	11/07 09:40	11/07 09:40	AC
Endosulfan II *	U	U	ug/L	0.006	0.018	625	11/07 09:40	11/07 09:40	AC
Endosulfan Sulfate *	U	U	ug/L	0.007	0.021	625	11/07 09:40	11/07 09:40	AC
Endrin *	U	U	ug/L	0.005	0.015	625	11/07 09:40	11/07 09:40	AC
Endrin Aldehyde *	U	U	ug/L	0.010	0.030	625	11/07 09:40	11/07 09:40	AC

Report To:
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Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Heptachlor *	U	U	ug/L	0.005	0.015	625	11/07 09:40	11/07 09:40	AC
Heptachlor Epoxide *	U	U	ug/L	0.008	0.024	625	11/07 09:40	11/07 09:40	AC
Toxaphene *	U	U	ug/L	0.40	1.20	625	11/07 09:40	11/07 09:40	AC
PCB-1016 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
CB-1221 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
PCB-1232 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
PCB-1242 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
PCB-1248 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
PCB-1254 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
PCB-1260 (screen) *	U	U	ug/L	0.10	0.30	625	11/07 09:40	11/07 09:40	AC
Dioxin (screen)	U	U	ug/L	0.03	0.09	625	11/07 09:40	11/07 09:40	AC
Azobenzene *	U	U	ug/L	0.75	2.25	625	11/07 09:40	11/07 09:40	AC
Methoxychlor *	U	U	ug/L	0.007	0.021	625	11/07 09:40	11/07 09:40	AC
Benzoic Acid	U	U	ug/L	0.84	2.52	625	11/07 09:40	11/07 09:40	AC
Aniline	U	U	ug/L	0.50	1.50	625	11/07 09:40	11/07 09:40	AC
4-Chloroaniline	U	U	ug/L	0.65	1.95	625	11/07 09:40	11/07 09:40	AC
Dibenzofuran	U	U	ug/L	0.66	1.98	625	11/07 09:40	11/07 09:40	AC
2-Nitroaniline	U	U	ug/L	0.58	1.74	625	11/07 09:40	11/07 09:40	AC

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
3-Nitroaniline	U	U	ug/L	0.50	1.50	625	11/07 09:40	11/07 09:40	AC
4-Nitroaniline	U	U	ug/L	0.84	2.52	625	11/07 09:40	11/07 09:40	AC
Carbazole *	U	U	ug/L	0.68	2.04	625	11/07 09:40	11/07 09:40	AC
2,6-Dichlorophenol	U	U	ug/L	0.89	2.67	625	11/07 09:40	11/07 09:40	AC
'yridine	U	U	ug/L	0.99	2.97	625	11/07 09:40	11/07 09:40	AC
2,3,4,6-Tetrachlorophenol	U	U	ug/L	1.00	3.00	625	11/07 09:40	11/07 09:40	AC
2,3,5,6-Tetrachlorophenol	U	U	ug/L	0.80	2.40	625	11/07 09:40	11/07 09:40	AC
8260.C Volatile Organics in Water by GC/MS				**Dilution Factor =1**					
Acetone	U	U	ug/L	1.75	5.25	5030/8260C	11/03 15:52	11/03 15:52	MMD
Acrolein	U	U	ug/L	0.75	2.25	5030/8260C	11/03 15:52	11/03 15:52	MMD
Acrylonitrile	U	U	ug/L	0.41	1.23	5030/8260C	11/03 15:52	11/03 15:52	MMD
Methyl Ethyl Ketone	U	U	ug/L	0.75	2.25	5030/8260C	11/03 15:52	11/03 15:52	MMD
Dichlorodifluoromethane	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:52	11/03 15:52	MMD
Chloromethane	U	U	ug/L	0.35	1.05	5030/8260C	11/03 15:52	11/03 15:52	MMD
Vinyl Chloride	U	U	ug/L	0.34	1.02	5030/8260C	11/03 15:52	11/03 15:52	MMD
Bromomethane	U	U	ug/L	0.41	1.23	5030/8260C	11/03 15:52	11/03 15:52	MMD
Chloroethane	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:52	11/03 15:52	MMD
Trichlorofluoromethane	U	U	ug/L	0.47	1.41	5030/8260C	11/03 15:52	11/03 15:52	MMD

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,1-Dichloroethene	U	U	ug/L	0.52	1.56	5030/8260C	11/03 15:52	11/03 15:52	MMD
Methylene Chloride	U	U	ug/L	0.99	2.97	5030/8260C	11/03 15:52	11/03 15:52	MMD
Trans-1,2-Dichloroethene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:52	11/03 15:52	MMD
Methyl-Tert-Butyl Ether	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,1-Dichloroethane	U	U	ug/L	0.53	1.59	5030/8260C	11/03 15:52	11/03 15:52	MMD
2,2-Dichloropropane	U	U	ug/L	0.31	0.93	5030/8260C	11/03 15:52	11/03 15:52	MMD
Cis-1,2-Dichloroethene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:52	11/03 15:52	MMD
Chloroform	U	U	ug/L	0.80	2.40	5030/8260C	11/03 15:52	11/03 15:52	MMD
Bromochloromethane	U	U	ug/L	0.55	1.65	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.25	0.75	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,1-Dichloropropene	U	U	ug/L	0.07	0.21	5030/8260C	11/03 15:52	11/03 15:52	MMD
Carbon Tetrachloride	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:52	11/03 15:52	MMD
Benzene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2-Dichloroethane	U	U	ug/L	0.24	0.72	5030/8260C	11/03 15:52	11/03 15:52	MMD
Trichloroethene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2-Dichloropropane	U	U	ug/L	0.20	0.60	5030/8260C	11/03 15:52	11/03 15:52	MMD
Bromodichloromethane	U	U	ug/L	0.24	0.72	5030/8260C	11/03 15:52	11/03 15:52	MMD
2-Chloroethylvinyl Ether	U	U	ug/L	1.00	3.00	5030/8260C	11/03 15:52	11/03 15:52	MMD

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Ft Myers, FL 33908

Report Printed: 11/22/06
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Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Dibromomethane	U	U	ug/L	0.42	1.26	5030/8260C	11/03 15:52	11/03 15:52	MMD
Cis-1,3-Dichloropropene	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:52	11/03 15:52	MMD
Toluene	U	U	ug/L	0.14	0.42	5030/8260C	11/03 15:52	11/03 15:52	MMD
Trans-1,3-Dichloropropene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.36	1.08	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,3-Dichloropropane	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:52	11/03 15:52	MMD
Tetrachloroethene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:52	11/03 15:52	MMD
Dibromochloromethane	U	U	ug/L	0.39	1.17	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2-Dibromoethane (EDB)	U	U	ug/L	0.40	1.20	5030/8260C	11/03 15:52	11/03 15:52	MMD
Bromobenzene	U	U	ug/L	0.46	1.38	5030/8260C	11/03 15:52	11/03 15:52	MMD
Chlorobenzene	U	U	ug/L	0.09	0.27	5030/8260C	11/03 15:52	11/03 15:52	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,1,1,2-Tetrachloroethane	U	U	ug/L	0.37	1.11	5030/8260C	11/03 15:52	11/03 15:52	MMD
m & p-Xylene	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:52	11/03 15:52	MMD
o-Xylene	U	U	ug/L	0.19	0.57	5030/8260C	11/03 15:52	11/03 15:52	MMD
Styrene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:52	11/03 15:52	MMD
Isopropylbenzene	U	U	ug/L	0.50	1.50	5030/8260C	11/03 15:52	11/03 15:52	MMD
Bromoform	U	U	ug/L	0.38	1.14	5030/8260C	11/03 15:52	11/03 15:52	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,1,2,2-Tetrachloroethane	U	U	ug/L	0.29	0.87	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2,3-Trichloropropane	U	U	ug/L	0.23	0.69	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,3,5-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:52	11/03 15:52	MMD
2-Chlorotoluene	U	U	ug/L	0.13	0.39	5030/8260C	11/03 15:52	11/03 15:52	MMD
4-Chlorotoluene	U	U	ug/L	0.16	0.48	5030/8260C	11/03 15:52	11/03 15:52	MMD
Tert-Butylbenzene	U	U	ug/L	0.16	0.48	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2,4-Trimethylbenzene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:52	11/03 15:52	MMD
Sec-Butylbenzene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:52	11/03 15:52	MMD
P-Isopropyltoluene	U	U	ug/L	0.11	0.33	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,3-Dichlorobenzene	U	U	ug/L	0.20	0.60	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,4-Dichlorobenzene	U	U	ug/L	0.14	0.42	5030/8260C	11/03 15:52	11/03 15:52	MMD
n-Butylbenzene	U	U	ug/L	0.21	0.63	5030/8260C	11/03 15:52	11/03 15:52	MMD
n-PropylBenzene	U	U	ug/L	0.17	0.51	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2-Dichlorobenzene	U	U	ug/L	0.48	1.44	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.30	0.90	5030/8260C	11/03 15:52	11/03 15:52	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.82	2.46	5030/8260C	11/03 15:52	11/03 15:52	MMD
Hexachlorobutadiene	U	U	ug/L	0.57	1.71	5030/8260C	11/03 15:52	11/03 15:52	MMD
Naphthalene	U	U	ug/L	0.015	0.045	5030/8260C	11/03 15:52	11/03 15:52	MMD

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
1,2,3-Trichlorobenzene	U	U	ug/L	1.27	3.81	5030/8260C	11/03 15:52	11/03 15:52	MMD
SUB 531 Carbamate Pesticides: 62-550.310(4)(b				**Dilution Factor =1**					
Carbofuran	U	U	ug/L	0.45	1.35	531.1	11/09 18:37	11/09 18:37	E83079
Oxamyl (vydate)	U	U	ug/L	0.52	1.56	531.1	11/09 18:37	11/09 18:37	E83079
B 531 Carbamate Pesticides: 62-550.UNREGULA				**Dilution Factor =1**					
Aldicarb Sulfoxide	U	U	ug/L	0.48	1.44	531.1	11/15 00:09	11/15 00:09	E83079
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	11/15 00:09	11/15 00:09	E83079
Methomyl	U	U	ug/L	0.72	2.16	531.1	11/15 00:09	11/15 00:09	E83079
3-Hydrocarbofuran	U	U	ug/L	0.87	2.61	531.1	11/15 00:09	11/15 00:09	E83079
Aldicarb	U	U	ug/L	0.31	0.93	531.1	11/15 00:09	11/15 00:09	E83079
Carbaryl	U	U	ug/L	0.72	2.16	531.1	11/15 00:09	11/15 00:09	E83079
Glyphosate	U	U	ug/L	3.2	9.6	547.1	11/08 01:18	11/09 01:18	E83079
Endothall	U	U	ug/L	2.7	8.1	548.1	11/09 02:25	11/11 02:25	E83079
SUB 549 Diquat : 62-550.310(4)(b)				**Dilution Factor =1**					
Diquat	U	U	ug/L	1.00	3.00	549.2	11/09 18:37	11/09 18:37	E83079
Gross Alpha	3.8 ± 0.7		pCi/L	1.0	3.0	EPA 00-02	11/09 17:45	11/09 17:45	E84088
Radium-226	1.9 ± 0.1		pCi/L	0.10	0.30	EPA 903.1	11/12 13:43	11/12 13:43	E84088

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27184

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Water

Sample I.D.: MW-1 Lower 2136'- 2199'
Collected: 11/02/06 16:30
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Radium-228	0.5 ± 0.5		pCi/L	0.50	1.50	EPA Ra-05	11/09 15:28	11/09 15:28	E84088

QC=Qualifier Codes as defined by DEP 62-160
Unless indicated, soil results are reported based on actual (wet) weight basis.
Analytes not currently NELAC certified denoted by *.
***rk performed by outside (subcontract) labs denoted by Cert.ID in Analyst Field.
Its relate only to the sample.

Authorized CSM Signature
Florida Environmental;Certification # E86006

Report To:
Edward McCullers
Youngquist Brothers, Inc.
15465 Pine Ridge Road
Ft Myers, FL 33908

Report Printed: 11/22/06
Submission # 611000054
Order # 27194

Project: Clewiston DZMW-1
Site Location: Clewiston, Fl
Matrix: Drinking Water

Sample I.D.: Inj.Test Source Water
Collected: 11/02/06 16:55
Received: 11/03/06 08:30
Collected by: Alberto Pozo

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Coliform-Total (E-Coli)	P(A)		--------			9223B	11/03 10:46	11/04 10:46	DSM
Specific Conductance (grab)	839		Ω*cm.	0.1	0.3	120.1	11/06 08:48	11/06 08:48	EMS
pH	9.60	Q	units	0.1	0.3	150.1	11/03 17:00	11/03 17:00	EMS
Total Dissolved Solids (TDS)	688		mg/L	1.00	3.00	EPA 160.1	11/06 13:50	11/06 13:50	EMS
ıloride	132		mg/L	17.50	52.50	300.0	11/10 09:52	11/13 13:37	DGK
Sulfate	147		mg/L	1.70	5.10	300.0	11/10 09:52	11/13 16:14	DGK

QC=Qualifier Codes as defined by DEP 62-160
Unless indicated, soil results are reported based on actual (wet) weight basis.
Analytes not currently NELAC certified denoted by *.
Work performed by outside (subcontract) labs denoted by Cert.ID in Analyst Field.
Results relate only to the sample.

Authorized CSM Signature
Florida Environmental;Certification # E86006

SUBM...SION # 611-054

Logged in LIMS by _____
CSM assigned _____

Florida Environmental

CHAIN OF CUSTODY RECORD

1460 W. McNab Road Ft Laud. FL 33309 Tel: (954) 978-6400 Fax: (954) 978-2233
940 Alt. 27 South Babson Park, FL 33827 Tel: (863) 638-3255 Fax: (863) 638-3637
630 Indian Street Savannah, GA 31401 Tel: (912) 238-5050 Fax: (912) 234-4815
528 Gooch Road Fort Meade, FL 33841 Tel: (863) 285-8145 Fax: (863) 285-7030

Original-Return w/report | Yellow- Lab File Copy | Pink- Sampler Copy

DUE DA... equested

RUSH RESERVATION #

Rush Surcharges apply

Report to: *(company name)* YBI Kevin Gruel
Report to Address:

Invoice to: *(company name)* Youngquist Brothers Inc
Purchase Order #
Invoice to Address:

Project Name and/or Number Clewiston DZMW 1
Site Location:

Project Contact: Ed McCullers
Phone: 239-489-4444
Fax:

Sampler Name: (printed) ~~Cameron Webster~~ Alberto Pozo
Sampler Signature
Email: Mary Beth @ Youngquist Bros. Com and Andy Miller @ Groundwater Supply. Com

	ORDER # Lab Control Number (Shaded Areas For Laboratory Use Only)	Sample ID	Date Sampled	Time Sampled	Matrix (DW SW GW WW S SED HW BIO SEA OIL X AIR)	Bottle & Pres. Combo Codes	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required	Field Tests TEMP -C	PH	COND	CHLOR
1	27183	MW 1 Upper						Primary & Secondary See Attached List for Both Wells				
2		1950' - 2000'	11-2-06	16:07	GW				23.2	8.2	20,050	
3												
4	27184	MW 1 Lower		16:30	GW				23.6	7.4	44,600	
5		2136-2199	11-2-06									
6												
7												
8												
9												
10												

Special Comments:

"I waive NELAC protocol" (sign here) >

Total

Deliverables: QA/QC Report Needed? Yes No *(additional charge)*

	SAMPLE CUSTODY AND TRANSFER SIGNATURES	DATE / TIME
1	Relinquished by:	
1	Received by:	11/02/06 15:07
2	Relinquished by:	11/03/06 8:30
2	Received by:	11/3/06 0850
3	Relinquished by:	
3	Received by:	

Sample Custody & Field Comments

Temp as received 4 C

Custody Seals? Y N

Billable Field Time 4 hrs

Misc. Charges _____

Bottle Type
A-liter amber
B-Bacteria bag/bottle
F-500 ml O-125 ml
L-liter bottle
S4- 4 oz soil jar / S8- 8 oz soil jar
T-250 ml
V-40 ml vial
W-wide mouth
X-other TED=Tedlar Air Bag

Preservatives
A-ascorbic acid P-H3PO4
C-HCL S-H2SO4
Cu-CuSO4 T-Na2S2O3-H2O
H-HNO3 U-Unpreserved
M-MCAB P-H3PO4
N-NaOH Z-zinc acetate
NH4-NH4CL

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SUBMISSION # 611-054

Logged in LIMS by MR

CSM assigned

CHAIN OF CUSTODY RECORD

Florida Environmental

1460 W. McNab Road Ft Laud. FL 33309 Tel: (954) 978-6400 Fax: (954) 978-2233
940 Alt. 27 South Babson Park, FL 33827 Tel: (863) 638-3255 Fax: (863) 638-3637
630 Indian Street Savannah, GA 31401 Tel: (912) 238-5050 Fax: (912) 234-4815
528 Gooch Road Fort Meade, FL 33841 Tel: (863) 285-8145 Fax: (863) 285-7030

DUE DATE requested

RUSH RESERVATION #

Original-Return w/report | Yellow- Lab File Copy | Pink- Sampler Copy

Rush Surcharges apply

Report to: (company name) YBI Kevin Gruel

Invoice to: (company name) Youngquist Bros Inc

Purchase Order #

Project Name and/or Number Clewiston DZM1

Project Contact: Ed McCullers.

Phone: 239-489-4444

Sampler Name: (printed) Cameron Webster Alberto Pozo

Sampler Signature

Report to Address:

Invoice to Address:

Site Location:

Fax:

Email: MaryBeth @ Youngquist Brothers . Com and Andy Miller @ Groundwater Supply . Com

ORDER # Lab Control Number (Shaded Areas For Laboratory Use Only)	Sample ID	Date Sampled	Time Sampled	Matrix (DW SW GW WW S SED HW BIO SEA OIL X AIR)	Bottle & Pres. Combo Codes	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required: PH	Conductivity	Chloride	TDS	Sulfate	Total Coliform	Field Tests: TEMP-C	PH	COND	CHLOR
1 27194	Injection Test															
2	Source Water	11-2-06	1655 (Surface Water)	SW	2		✓	✓	✓	✓	✓	✓	23.3	9.7	1040	
3																
4																
5																
6																
7																
8																
9																
10																

Special Comments:

"I waive NELAC protocol" (sign here) >

Total

Deliverables: QA/QC Report Needed? Yes No (additional charge)

SAMPLE CUSTODY AND TRANSFER SIGNATURES		DATE / TIME
1	Relinquished by:	
1	Received by:	11/02/06 15:07
2	Relinquished by:	11/03/06 8:30
2	Received by:	11/3/06 0830
3	Relinquished by:	
3	Received by:	

Sample Custody & Field Comments

Temp as received <1 C

Custody Seals? Y N

Billable Field Time ____ hrs

Misc. Charges ____

Bottle Type
A-liter amber
B-Bacteria bag/bottle
F-500 ml O-125 ml
L-liter bottle
S4- 4 oz soil jar / S8- 8 oz soil jar
T-250 ml
V-40 ml vial
W-wide mouth
X-other TED=Tedlar Air Bag

Preservatives
A-ascorbic acid P-H3PO4
C-HCL S-H2SO4
Cu-CuSO4 T-Na2S2O3-H2O
H-HNO3 U-Unpreserved
M-MCAB P-H3PO4
N-NaOH Z-zinc acetate
NH4-NH4CL

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Permit Item Reference 6.c.(9)
Draft Operations & Maintenance Manual

City of Clewiston, Florida

Water Treatment Plant Injection Well System
Draft Operation and Maintenance Manual

July 2007

City of Clewiston, Florida

Water Treatment Plant Injection Well System Draft Operation and Maintenance Manual

July 2007

27335-45307-002

Section 1
Introduction

The City of Clewiston, Florida, (City) completed construction of a Class I injection well (IW-1) in 2007, including one dual zone monitor well (DZMW-1), and associated surface facilities. The purpose of this well is for the disposal of 4 million gallons per day (MGD) of concentrate by-product (concentrate) generated from its water treatment plant (WTP).

This operations and maintenance (O&M) manual is intended to meet both the regulatory and operational needs (including emergency procedures) for operation of the Class I injection well at the City's WTP facility. Operation of the injection wells is regulated by the Florida Department of Environmental Protection (FDEP). The rules governing the construction and operation of injection wells in the State of Florida are contained in the Florida Administrative Code (F.A.C.), Rule 62, Section 528.

One of the FDEP mandated operational requirements, as contained in Rule 62-528, F.A.C., is that all injection well operations be conducted in accordance with an FDEP approved O&M manual. A copy of this manual shall be made available to operators, maintenance personnel, and other relevant personnel by The City. Any proposed modifications to this FDEP approved O&M manual (i.e. to reflect possible efficiencies gained through site-specific operational experience) must be submitted for review and approval by the FDEP.

Monthly operating and monitoring reports, as required by the pertinent FDEP operating and/or construction permits, as well as any inquires regarding regulatory guidance for the operation of the injection wells, should be directed to the FDEP at the following address:

Underground Injection Control Program
Florida Department of Environmental Protection
South District Office
2295 Victoria Avenue, Suite 364
Fort Myers, Florida 33901-3881
or
P.O. Box 2549
Fort Myers, Florida 33902-2549

Telephone: (239) 332-6975

Injection well IW-1 operates under UIC Class I Construction Permit Number 249635-001-UC until such time the system successfully completes operational testing and an operations permit is issued. A copy of the permit is enclosed in Appendix A.

This O&M manual is organized in the following manner:

- Section 2.0 Injection Well System: Surface Equipment: provides a description of the major components of the injection system. An overall flow schematic is provided.
- Section 3.0 Well Construction Details: describes the construction details of the deep injection wells and the monitoring system.
- Section 4.0 Regulatory Requirements: reviews the regulatory operating, testing, and reporting requirements, including the monitoring reporting requirements.
- Section 5.0 Standard Operating Procedures: details startup, shut down, and standard operating procedures for the injection wells.
- Section 6.0 Non-routine and Emergency Operations: provides a discussion of emergency operating procedures.
- Section 7.0 Monitoring Procedures and Equipment Calibration: provides information on sampling techniques, instrument calibration, testing, and monitoring required by the FDEP on weekly, monthly, annual, and five year intervals.
- Section 8.0 Equipment Maintenance and Inspection: provides maintenance and inspection instructions on the injection well equipment.
- Section 9.0 Safety Procedures: provides safety procedure information.
- Section 10.0 Plug and Abandonment Provisions for Well Obsolescence.
- Appendix A: IW-1 Construction Permit
- Appendix B: Record Drawings
- Appendix C: Emergency Contact List
- Appendix D: FDEP Standard Operating Procedures

Section 2
Injection Well System: Surface Equipment

The major components of the injection well system at the City of Clewiston injection well facility consist of:

- piping system including hydraulic surge arrestor;
- one dual zone monitor well number 1 (DZMW-1); and
- subsurface cased and open-hole portions of the injection well (IW-1).

Residual pressure from the water treatment process is utilized to convey the concentrate into the injection well so that a pump station is not required.

A schematic diagram of the wellhead construction details and injection well piping diagram of IW-1 is provided as **Figure 2-1**.

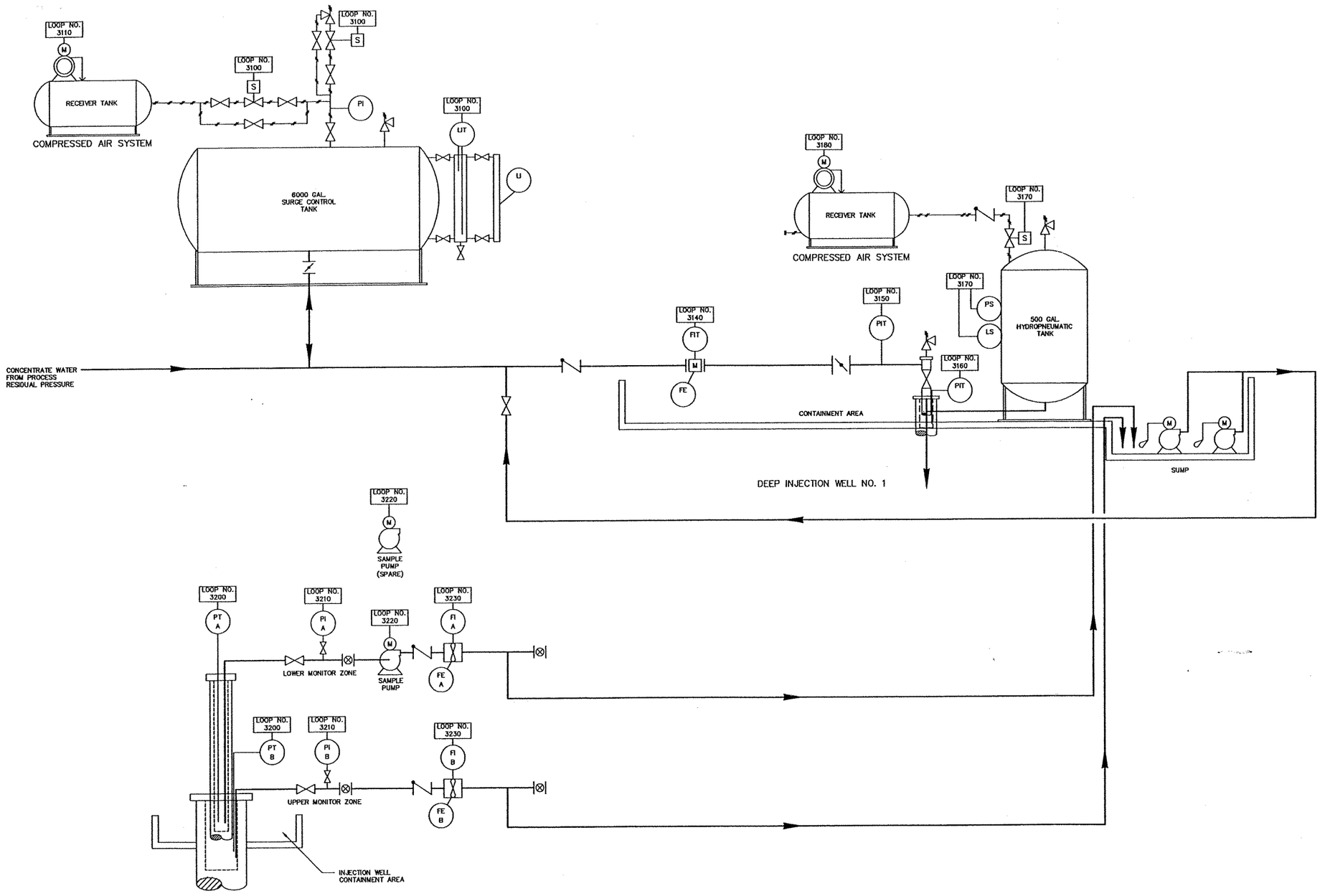
The following is a summary of the surface equipment components. Detailed specifications as to the surface equipment are provided in "City of Clewiston Water System Improvements Concentrate Disposal Well O & M Manual, Youngquist Brothers, Inc. 2007".

2.1 Hydropneumatic Tank

An approximately 6,050 gallon steel hydropneumatic tank is provided for hydraulic surge arresting in the event there is a sudden flow loss or obstruction occurs. The tank is rated for 100 psig maximum working pressure and is equipped with a high pressure rated level gauge. The system is connected as an offset to the 12-inch diameter main injection piping and can be isolated from the system by a gate valve. Pressure is maintained in the tank through the use of 5 horsepower air compressor assembly.

2.2 Piping System

The injection wellhead is connected to a 12-inch diameter injection pipeline that includes an inline magnetic flow meter and a 12-inch diameter Apco rubber flapper swing check valve. All above ground piping is 316L stainless steel. The pressure is measured with a pressure transmitter and a manual pressure gauge (0-50 psig). A 12-inch diameter Pratt butterfly valve is located between the wellhead and injection pipeline which isolates the pipeline from the wellhead. A 12-inch diameter DeZurik knife valve is located at the injection wellhead and can isolate the well from the rest of the system. To mitigate the effects of gases in the injectate, a 4-inch diameter Apco air release combination valve is installed offset at the top of the injection wellhead. A 4-inch diameter knife valve can isolate the air release combination valve from the rest of



DUAL ZONE MONITORING WELL HEAD

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: J. ELIAS
DRAWN BY: J. ELIAS
SHEET CHK'D BY: J. ELIAS
CROSS CHK'D BY: C. WENDT
APPROVED BY: W. NELSON
DATE: OCTOBER 2005

CDM Camp Dresser & McKee Inc.
consulting engineering construction operations
1601 Belvedere Road, Suite 211, South
West Palm Beach Florida, 33406
Tel: (561)-689-3336
FL COA No. EB-0000020

CITY OF CLEWISTON, FLORIDA

CONCENTRATE DISPOSAL INJECTION WELL

PROCESS & INSTRUMENTATION SCHEMATIC

FIGURE NO.

2-1

the system. There is a 4-inch diameter piping tap upstream of the check valve into the injection pipeline that allows for purge water from monitor well sampling to be disposed of down the injection well.

2.3 Annular Pressure Tank

An Antrol Corp. Model WX-457-C 528 gallon capacity bladder tank is provided for annular space protection. The tank is rated for a working pressure of 125 psi . The bladder is pressurized under normal operations for surge arresting purposes in the annular space.

2.4 Monitor Well Sampling System

The monitor well sampling system consists of a sampling/purge pump for the lower monitor zone, while the upper monitor zone at the time of construction completion had sufficient artesian pressure to flow at the surface. The sampling/purge pump Iwaki-America model SMD-401 1 horsepower pump. The discharge from both zones is routed to a sampling sump. Two sump pumps are used to transfer the collected purge water from the sump to the injection pipeline through a 4-inch diameter pipeline. The pumps are Grundfos Redi-Flo Environmental Series Model 60S/E50-7 Stage and have 5-horsepower motors. The pumps are constructed of stainless steel and Teflon.

2.5 Wellhead Monitor Systems

2.5.1 Injection Well

Injection flow rates are measured with a magmeter flowmeter (ABB Kent-Taylor) located at the deep well analyzer building. Wellhead pressures are measured with a pressure transmitter (0 to 50 psi) as well as a manual pressure gauge (0 to 50 psi) located at the wellhead. The injection well instrumentation continuously transmits injection flow and wellhead pressure signals to the system computer and are recorded on PLC No. 1 located in the deep well analyzer building. The building is located approximately 100 feet to the southeast of IW-1. The PLC is set to record flows from 0 to 3 MGD and pressures from 0 to 60 psi.

2.5.2 Monitor Well Wellhead Monitor System

The pressure of the upper monitor zones and the potentiometric water level in the deep monitor zone are measured electronically using pressure transducers and recorded electronically using computer data loggers and also by analog pressure gauges. The zones are monitored on a continuous basis. The water level and pressure information for the monitor wells are displayed on the instrument panel located in the Electrical Building. Each monitor well has a separate access port to allow for collection

of representative water samples. During purging operations prior to sampling, the discharged water from the monitor wells is directed via piping to the injection wells.

2.6 Remote Recording Station

As discussed above, pressure and flow information from the injection wells and pressure and water level information from the monitor wells are continuously relayed to and recorded at the instrument control panel located in the Electrical Building. The instrument control panel also allows for remote startup and shut down of the injection wells. The panel has an alarm system to provide an indication that an emergency situation is occurring. Alarm lights are also present at the wellhead instrument panel of the injection wells.

Section 3
Injection Wells and Dual Zone Monitor Well Construction Details

3.1 Injection Well System Design and Construction

The City of Clewiston injection well system disposes of concentrate into the highly fractured dolomite portion of the Oldsmar Formation. The top of the Oldsmar Formation is tentatively placed at approximately 2,700 ft below pad level (bpl) in injection well IW-1, at the approximate top of 50-foot thick unfractured dolostone unit that serves as confinement. Identification of the exact boundary depth is complicated by the extensive dolomitization, which obliterated diagnostic textural and fauna indicates of the boundary. The background water quality in the injection zone largely reflects the composition of the native formation water and is saline. The water level within the injection zone under static condition is generally within a few feet of land surface at the site.

3.2 Injection Well IW-1 Well Construction

IW-1 was installed in 2006/2007 with Camp Dresser & McKee Inc. as the engineer of record. **Table 3-1** provides a summary of the construction details for IW-1 and **Figure 3-1** is provided as a record drawing of the well. The well was constructed with four steel casing strings as follows: (1) 48-inch OD, 0.375-inch wall, steel conductor casing set at 246 feet bpl, (2) 36-inch OD, 0.375-inch wall, steel surface casing to 975 feet bpl, (3) 26-inch OD, 0.375-inch wall, steel intermediate casing to 2,105 feet, and (4) 16-inch OD, 0.5-inch wall thickness, steel injection casing set at a depth of 2,749 feet bpl. All casing strings were cemented in place from just below casing bottom depth to land surface. Cementing was conducted in stages and temperature logs were run inside the casings following each cement stage to ascertain the integrity of that stage. A cement bond log (CBL) was run after the cementation of the injection casing. The open hole interval of injection well IW-1 extends from 2,749 feet bpl to 3,505 feet bpl.

The intermediate casing was set at 2,105 feet bpl to case off all underground sources of drinking water (USDW), which are defined by the United States Environmental Protection Agency (EPA) and the FDEP as any source of groundwater with a total dissolved solids (TDS) concentration of less than 10,000 milligrams per liter (mg/L). The base of the lowest USDW at the City of Clewiston site occurs at approximately 1,950 feet bpl, based on data collected during the drilling of IW-1.

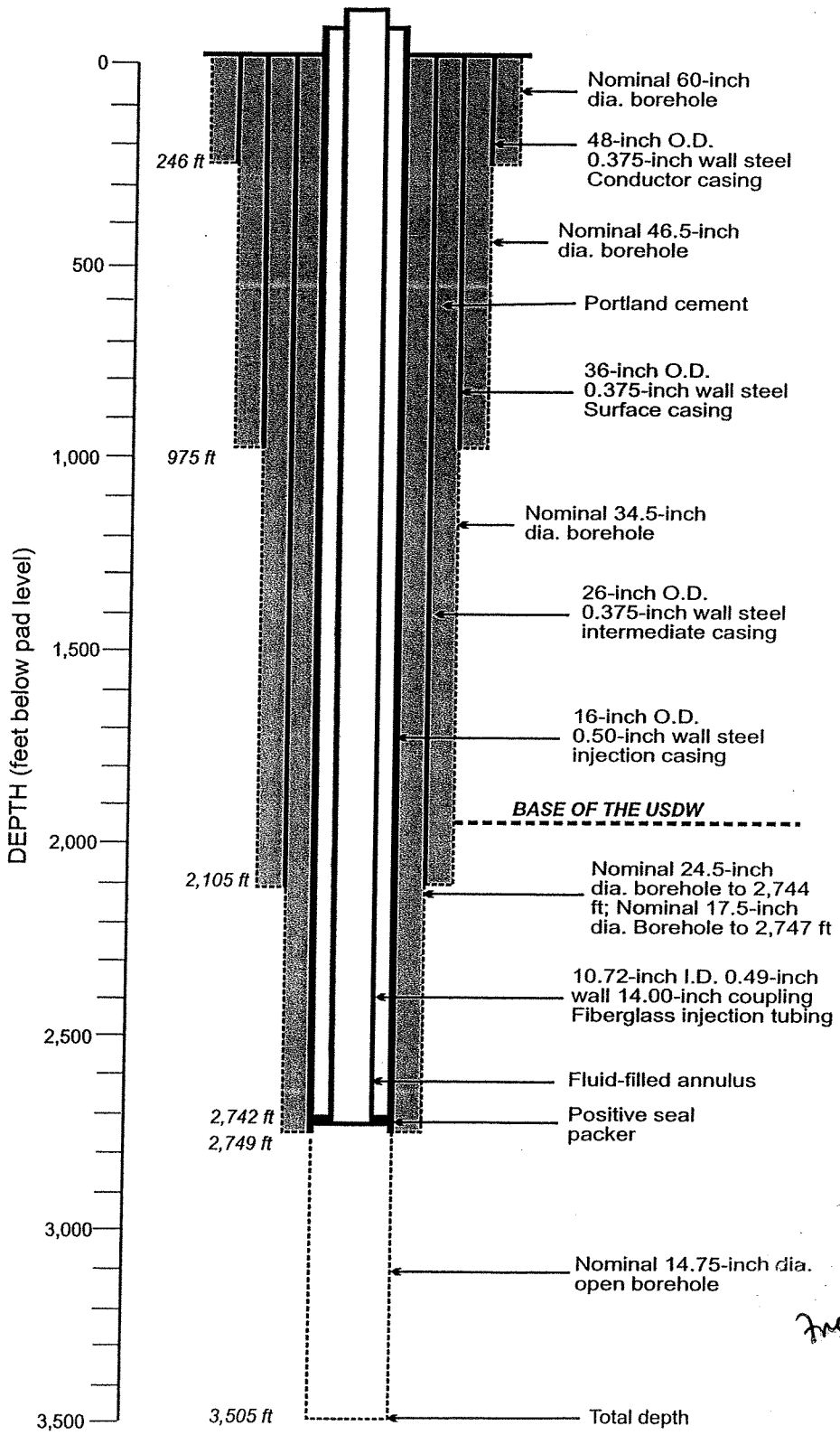
A 11.72-inch OD fiberglass reinforced plastic tubing was installed to a depth of 2,742 feet bpl inside the final injection casing. A packer was set at the base of the tubing within the casing.

The final well construction report for injection well IW-1 contains more detailed information on the system construction.

TABLE 3-1
INJECTION WELL SYSTEM CONSTRUCTION DETAILS SUMMARY
CITY OF CLEWISTON WTP FACILITY
INJECTION WELL IW-1 AND
MONITOR WELL DZMW-1

Well	Casing	Casing Material	Casing Thickness (inches)	Casing OD (inches)	Casing Depth (feet)	Open-Hole Interval (feet)
IW-1	Conductor	Steel	0.375	44	246	--
	Surface	Steel	0.375	38	975	--
	Intermediate	Steel	0.375	28	2,105	--
	Final	Steel	0.500	18	2,749	--
	Tubing	FRP	0.49	11.72	2,742	--
						2,749 to 3,505
DZMW-1	Conductor	Steel	0.375	28	246	--
	Surface	Steel	0.375	20	970	--
	Intermediate	Steel	0.375	12.75	1,950	1,950 to 2,000
	Final	FRP	0.52	6.46	2,132	2,132 to 2,200

OD = Outside Diameter



Clewiston/Final Construction Report/Clewiston IW Figure 3-1.cdr 2/08/06 DAY

Frank A Bruno 7/3/07

Figure 3-1
Clewiston WTP Injection Well System
As-built diagram of injection well IW-1

CDM

3.3 Dual Zone Monitor Well DZMW-1 Construction

DZMW-1 was installed at the City of Clewiston site in 2006/2007. The purpose of DZMW-1 is to detect any upward migration of fluids from the injection zone. Table 3-1 provides construction details for DZMW-1 and **Figure 3-2** is provided as a record drawing. DZMW-1 was constructed with a 28-inch OD, 0.375-inch wall, steel surface casing set at a depth of 246 feet bpl, a 20-inch OD, 0.375-inch wall, steel intermediate casing set at a depth of 970 feet bpl, a 12.75-inch OD, 0.375-inch wall, steel monitor casing set at a depth of 1,950 feet bpl and a 6.46-inch OD FRP set at a depth of 2,132 feet bbl. With the exception of the final casing string, the other casing strings were cemented in place from just below casing bottom depth to surface level. The final casing string was cemented from 2,000 to 2,132 feet bpl. Cementing was conducted in stages. The zones that DZMW-1 monitors are from 1,950 to 2,000 feet bpl and 2,132 to 2,200 feet bpl. This provides for open-hole sections for sampling.

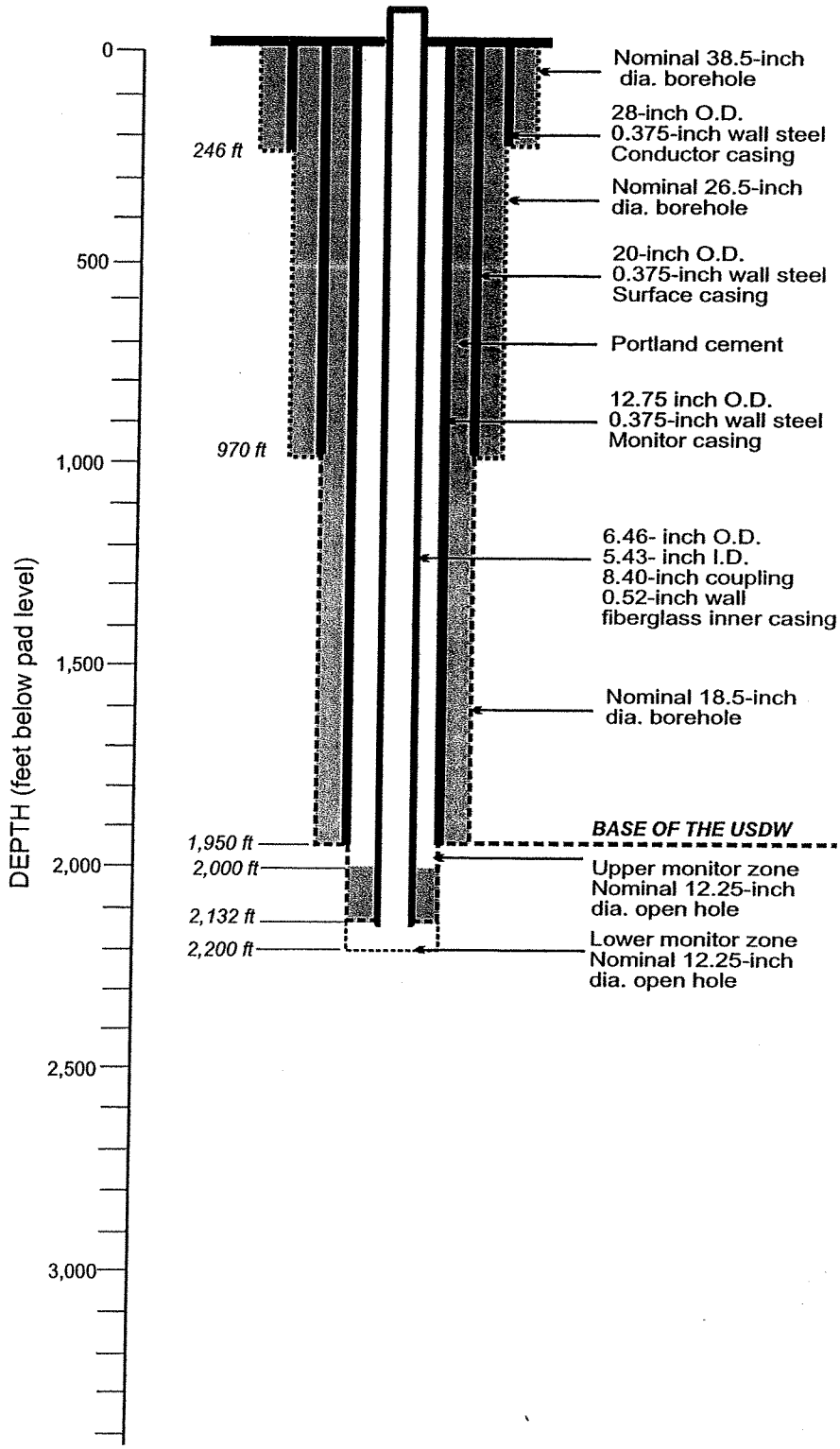


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Figure 3-2
Clewiston WTP Injection Well System
As-built diagram of dual zone monitor well DZMW-1

CDM

Section 4
Regulatory Requirements

4.1 Injection Well Operating Restrictions

Injection well IW-1 operates under UIC Class I Construction Permit Number 249635-001-UC. A copy of the permit is enclosed in Appendix A for IW-1. IW-1 has a rated capacity of 4 -MGD or a maximum rate of 2,800 gallons per minute (gpm). Maximum injection rates are governed by two factors: (1) the pressure at which the injection casing has been tested, and (2) a maximum injection velocity of 5 feet per second (fps). The injection casing of injection well IW-1 annulus was pressure tested at 153 pounds per square inch (psi). FDEP regulations (Rule 62-528, F.A.C.) allow injection at a maximum pressure of 67% of the test pressure. Therefore, injection well IW-1 can be operated at a maximum pressure of 103 psi.

4.2 FDEP Operational Testing Criteria

Operational testing is required by the FDEP to demonstrate that the injection wells can absorb the design and peak daily flows that are to be expected for the next five years. Operational testing may not exceed two years, by which time an application for a UIC operating permit must be submitted to the FDEP.

4.3 Routine Reporting Requirements

4.3.1 Monthly Operating Reports

Monthly operating reports (MOR), to be prepared by the City of Clewiston staff, for the injection well and the monitor well, shall be submitted to the FDEP offices in Fort Myers and Tallahassee no later than the last day of the month immediately following the month of record. The mailing addresses to which these reports should be sent are:

Underground Injection Control Program
Florida Department of Environmental Protection
South District Office
2295 Victoria Avenue, Suite 364
or
Fort Myers, Florida 33901-3881
P.O. Box 2549
Fort Myers, Florida 33902-2549

Florida Department of Environmental Protection
Underground Injection Control Program
MS 3530
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

The water quality and operational data may also be submitted in digital (i.e., electronic) format via email. An acceptable file format to be used may be Excel™ or comma delimited text (a.k.a. CSV). Data files should be electronically emailed simultaneously to both of the following address: david.rhodes@dep.state.fl.us and joe.haberfeld@dep.state.fl.us. Also, the signatory pages and the laboratory data sheets shall be mailed to the FDEP South District office.

Operational monitor parameters for the injection wells and monitor wells are summarized on **Table 4-1**. In case of operational failures of any of the monitoring instruments for a period of more than 48 hours, the City of Clewiston staff shall report to the FDEP in writing the remedial action to be taken and the date when the failure will be corrected.

4.3.2 Annual Summary Reports

An Annual Summary Report shall be submitted to FDEP in Fort Myers and Tallahassee UIC sections by June 1 of each year. The first report is due in the year 2008. the report shall address and summarize the preceding year of operations from January 1st through December 31st and shall include at a minimum the following:

- All injection well system monitoring data from the preceding year in both graphic and tabular formats.
- A summary of system efficiency.
- Proposed changes, if any, to the monitoring program.

4.4 Non-Routine Reporting Requirements

In the event that the City of Clewiston is unable to comply with the FDEP permit conditions for the injection wells for any reason, the FDEP must be notified. Notification must be made in person, by telephone, or by fax within 24 hours of breakdown or malfunction to the FDEP South District Office.

A written report of the noncompliance event must be submitted to the FDEP South District Office within five days after its occurrence. The report must describe the nature and cause of the breakdown or malfunction, the steps taken or planned to be taken to correct the problem, prevent its reoccurrence, emergency procedures used pending correction of the problem, and the projected time frame for when the Tropicana Bradenton facility will be returned to permit compliance.

Under emergency conditions a discharge may only occur by methods previously approved by the FDEP and all applicable federal, state, and local permits must be in place to allow for any alternate discharges due to emergency or planned outage conditions. For planned well shut-ins, the City will cease processing water for treatment and draw water from ground storage tanks. During unplanned well shut-in or well failure, flows are authorized for diversion to the percolation ponds of the

TABLE 4-1
OPERATIONAL MONITORING PARAMETERS
CITY OF CLEWISTON WTP FACILITY
INJECTION WELL IW-1 AND
MONITOR WELL DZMW-1

Parameter	Recording Frequency	Frequency of Analysis	
		WTP Concentrate Water Quality	DZMW-1: UMZ & LMZ
Maximum injection pressure (psi)	Continuous	D/M	
Minimum injection pressure (psi)	Continuous	D/M	
Average injection pressure (psi)	Continuous	D/M	
Maximum flow rate (MGD)	Continuous	D/M	
Minimum flow rate (MGD)	Continuous	D/M	
Average flow rate (MGD)	Continuous	D/M	
Total volume injected (MGD)	Continuous	D/M	
Maximum annular pressure (psi)	Continuous	D/M	
Minimum annular pressure (psi)	Continuous	D/M	
Average annular pressure (psi)	Continuous	D/M	
Annular fluid added/removed (gallons)	Continuous	D/M	
Annular fluid added/removed (psi)	Continuous	D/M	
Maximum water level (NGVD)/pressure (psi)	Continuous		D/M
Minimum water level (NGVD)/pressure (psi)	Continuous		D/M
Average water level (NGVD)/pressure (psi)	Continuous		M
Total Kjeldahl Nitrogen (mg/L)		M	W
pH (std. units)		M	W
Specific Conductivity (umhos/cm)		M	W
Chloride (mg/L)		M	W
Sulfate (mg/L)		M	W
Field Temperature (deg. C)		M	W
Total Dissolved Solids (mg/L)		M	M
Sodium (mg/L)		M	M
Calcium (mg/L)		M	M
Potassium (mg/L)		M	M
Magnesium (mg/L)		M	M
Iron (mg/L)		M	M
Bicarbonate (HCO3) (mg/L)		M	M
Gross Alpha		M	M(1)
Radium 226		M	M(1)
Radium 228		M	M(1)
Primary and Secondary Standards (Ch. 62-550.310 and .320, F.A.C.).(2)		A	A

A = annually TBD; D/M = daily and monthly; W= weekly; M = monthly;
UMZ: Upper Monitor Zone; LMZ: Lower Monitor Zone
(1) From lower monitor zone only.

City of Clewiston wastewater treatment plant. Any proposed changes in emergency disposal methods must be submitted for the FDEP South District Office review and approval. The City of Clewiston staff shall notify the FDEP South District Office within 24 hours of whenever the emergency discharge has been used. The City of Clewiston staff shall indicate the duration of the emergency discharge and the volume of fluid discharged to the emergency discharge location(s). Written notification shall be provided by City of Clewiston staff within 5 days after its occurrence. Included in the written notification shall be information such as the location and duration of the discharge and the volume of fluid discharged.

Section 5
Standard Operating Procedures

5.1 Start-Up Procedures for the Injection Wells

Operator should be familiar with the injection system and each of the various alternative waste disposal and storage options of the City of Clewiston injection system, as well as the operation of those options in various combinations.

5.1.1 General Pumping Instructions

The following general instructions apply to operation of the injection well system:

(1) Do not allow injection of concentrate using the residual pressure from the membrane skids against a closed valve on the injection piping. Damage to the membrane treatment process may occur as a result of overheating or pressure buildup. Check to assure that all valves in the flow path to the injection wells are open before using the residual pressure from the membrane skids for concentrate injection.

(2) All valves should be exercised at least once a month. A valve that remains in the fixed position for extended periods may "freeze". Damage to the valve can result when an attempt is later made to adjust it.

(3) Prior to performing repairs or maintenance, each piece of equipment should be de-energized and tagged at its main disconnect (circuit breaker) in the motor control panel. This will help to minimize personal injury or damage to electrical equipment.

(4) The injection well system should not be operated if the surge protection system has been deactivated. The facility supervisor should be notified immediately if the surge protection system is not operational.

5.1.2 Initial Injection Well Start-Up Pumping Instructions

The following pumping instructions apply to initial start-up operations for the injection well:

(1) Open the valves at the injection wellhead as appropriate to accommodate the desired flow rate. Begin operating the injection flow rate at approximately 700 gpm (1 MGD). Collect manual water level/pressure data at the wellhead during start-up. Once wellhead pressures have stabilized, increase flow rates by approximately 350 gpm increments and repeat until stabilized. Repeat process until the maximum design flow rate for the pumping system has been tested.

(2) Following the high-rate flow test, reduce flow-rate to normal desired rate and operate the injection system on an as-needed basis.

5.2 Standard Shutdown Procedures for the Injection Wells

The following procedures should be used to shut down the injection wells:

(1) Shut down all pumps. Pumps should be shut down one at a time and time should be allowed for all transient pressure pulses to expire.

(2) Slowly close the valves to the injection wells.

5.3 Standard Procedures for Sampling Monitor Zones

The following procedures should be used for sampling the dual zone monitoring well:

(1) Open 4-inch diameter knife valve upstream of check valve on injection line.

(2) Activate electrical power to sump pumps.

(3) Record starting values on flow meter totalizers at the DZMW-1 wellhead.

(4) Open valves to monitor zones. Upper zone should flow due to native pressure.

(5) Activate electrical power to sampling pump for lower zone.

(6) When volumes reach the required purge volume (found in the permit) collect sample from sampling tap at each well head by opening the valve.

Shut down procedure is the reverse of the startup procedure.

Section 6
Non-routine and Emergency Operations

6.1 Non-routine Operating Conditions

This section addresses conditions which deviate from normal operations and some procedures for remedying those conditions.

Injection Pressure
If the injection pressure of injection wells IW-1 103 psi, verify proper operation of the recording devices. If the recording devices appear to be functional, reduce the flow to the injection well until the injection pressure is at or below the regulatory limit for the injection well. If the injection pressure remains above the regulatory limit and flow cannot be further reduced due to operational requirements, the well must be shut down and the FDEP must be notified.

Injection Rate
If the injection rate is greater than 2,778 gpm for the injection wells, verify operation of the recording devices. If the recording devices appear to be functional, reduce the flow to the injection well until the injection rate is at or below the regulatory limit for the injection well. If the injection rate remains above the regulatory limit and flow cannot be further reduced due to operational requirements, the well must be shut down and the FDEP must be notified.

System Leaks
If a leak occurs in the injection well system, then flow should be diverted to an alternate disposal system and the FDEP should be notified. If the leak occurs upstream from the diversion connection to the alternate disposal system, then the discharge should be shut down and the FDEP should be notified.

6.2 Emergency Operating Procedures

As previously detailed in Section 4.4, when circumstances arise that make the use of emergency disposal procedures necessary, the following actions must be taken. These actions are required under Rule 62-528.415 (4), F.A.C.

A list of emergency contacts is included in Appendix D.

(a) In the event that the injection well system is temporarily unable to comply with any of the conditions of a permit due to breakdown of equipment, power outages, destruction by hazard of fire, wind, or by other cause, the City of Clewison staff shall notify the FDEP South District Office. Notification shall be made in person, by telephone, or by facsimile within 24 hours of breakdown or malfunction to the FDEP South District Office.

(b) A written report of any noncompliance referenced in (a) above shall be submitted to the appropriate district office within five days after its occurrence. The

report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions.

(c) Under emergency conditions a discharge may only occur by methods previously approved by the FDEP and all applicable federal, state, and local permits must be in place to allow for any alternate discharges due to emergency or planned outage conditions. During well shut-in or well failure, flows are authorized for diversion to the percolation ponds at the City of Clewiston wastewater treatment plant. Any proposed changes in emergency disposal methods must be submitted for FDEP review and approval. The City of Clewiston staff shall notify the FDEP South District Office within 24 hours of whenever the emergency discharge has been used. The City of Clewiston staff shall indicate the duration of the emergency discharge and the volume of fluid discharged to the emergency discharge location(s). Written notification shall be provided by the City of Clewiston staff within 5 days after its occurrence.

(d) In the event a well must be redeveloped, the applicant shall address disposal of backwashed fluids in a written submittal to the FDEP South District Office. The redevelopment of the well, including the disposal method, shall be approved by the FDEP South District Office in writing if it meets all applicable FDEP rules and it will not adversely affect the construction or operation of the well.

Section 7
Monitoring Procedures and Equipment Calibration

FDEP Standard Operating Procedures, which are enclosed in Appendix D, shall be followed for sampling events, handling, identification, shipment, sample custody, field measurements, and for quality assurance and quality control measures. Water samples shall be analyzed on a frequent basis for the parameters listed in Table 4-1.

7.1 Monitor Well Sampling Procedures

Standard procedures to be followed for monitor well sampling events include the following:

1. The pumping and or flow rates of all monitor zones shall be monitored during the purging procedure to determine the length of time required to evacuate three full casing volumes as listed in Item 1.

2. Water withdrawn from the monitor wells shall be pumped into a sump basin and then pumped onto the injection well for disposal.

3. Water samples for analysis shall be obtained from the sampling ports located on the discharge lines.

4. Water samples from the monitor zones shall be analyzed on a frequent basis for the parameters listed in Table 4-1. Water quality data may be reduced to monthly analyses after a minimum three months of data if the conditions of Rule 62-528.450(3)(d), F.A.C., have been met and with FDEP approval.

5. Monitor well water quality data shall be included in the operational report submitted to the appropriate FDEP offices on a monthly basis.

Water Sampling Quality Assurance Guidelines

1. Sampling should be conducted on a schedule as shown in Table 4-1.

2. Sampling should not be conducted on Fridays to prevent unnecessary holding times at the analytical laboratory.

3. Samples should be obtained within six hours of the completion of well purging.

4. Samples should only be collected in laboratory supplied sampling containers with the proper preservatives required for each parameter.

5. Chain of custody forms should be completed for each sampling event and submitted to the laboratory with the samples. Laboratory results should include a copy of the chain of custody.

6. Sampling should be performed and completed for each zone, including labeling, packing for storage, and paper work, prior to sampling the next zone to prevent sample mix-ups.

7. Samples should be packed on ice, and delivered promptly to a State certified laboratory for analyses.

7.2 Instrument Calibration

All instrumentation used for injection system monitoring purposes must be calibrated on a semi-annual basis. Records of calibration procedures used and dates of calibration of all equipment shall be maintained by the operator. Instruments and equipment to be calibrated on a semi-annual basis include the following:

1. Electronic flow and pressure transmitters

2. Electronic recording equipment

3. Gauges used at the wells

Calibration equipment should conform to N.S.I. Standards.

7.3 Specific Injectivity Tests

Specific injectivity tests should be conducted on a monthly basis for IW-1. This test evaluates the injection capacity of a well. The purpose of the test is to detect any changes in injection capacity that may have been caused by plugging or other flow-restricting conditions. The test should be run as follows (be sure that the valve to one of the injection wells not being tested is closed):

1. The operator should manually adjust the flow until a rate near the normal operating rate is obtained. Once the rate is established, the injection pressure should be recorded.

2. The operator should establish a minimum of two flow rates and corresponding pressures for each specific injectivity test. The established rates should be duplicated each time the injectivity tests are conducted for comparative purposes. The injection pumping station can then be manually shut down.

3. After the injection pump is shut off and the pressure has stabilized, the operator should record the shut-in pressure from the recorder chart and verify the measurement against the pressure indicator at the panel.

4. The specific injectivity index will be calculated by subtracting the shut-in pressure from the measured injection pressures and dividing the difference into each flow rate.

$$\frac{\text{Flow (gpm)}}{\text{[pumping pressure (psig) - shut-in pressure (psig)]}} = \text{gpm/psig}$$

5. At the end of the injection, the well must be shut-in for a time sufficient to record pressure fall-off. Times and pressures during this shut in period should be recorded.

When the test is completed, the operator will return the pump controls to the AUTO position.

Section 8
Equipment Maintenance and Inspection

The injection well system at the City of Clewiston facility represents a sizeable investment and requires a sound maintenance program. Repairs precipitated by breakdowns or other emergencies not only lead to a greater expense than preventative maintenance, but can cause considerable system disruption. A good preventative maintenance program contributes to successful facility operation by minimizing both expensive emergency repairs and unexpected interruptions of the operating schedule.

Preventative maintenance, repair, and calibration of electrical equipment are contracted out. Operating personnel should be informed of who to contact concerning electrical malfunctions.

Well maintenance should be performed by a qualified well drilling contractor. During maintenance, it will be necessary for the injection well to be off line. Therefore, if maintenance is being performed on one of the injection wells, the other injection well may be used to dispose of the effluent. The plant supervisor shall be consulted to schedule any testing or rehabilitation that may be required on the injection wells. The well shall be pressure neutralized prior to taking the well off line. Mixing and injecting a brine solution into the well, commonly referred to as "killing" the well, can neutralize the artesian pressure of the well. Alternatively, the backflushing pump could be used to pump the water level down by re-configuring the piping/valves at the wellhead. By opening and closing manual valves, the backflushing pump may be used to withdraw water from the injection well and keep the artesian flow from over-topping the well.

All the mechanical equipment that comprises the injection pumping system to the injection wells requires periodic inspection, lubrication, and adjustment. Regular mechanical maintenance is essential for keeping equipment in good operating condition and for locating and correcting minor malfunctions before the become major problems. Operating personnel should thoroughly familiarize themselves with the recommended mechanical maintenance procedures and schedules provided in the manufacturers' manuals for all pumps, valves, motors and other major equipment. A detailed log should be kept of all regular and emergency maintenance work performed. The following maintenance tasks should be performed at the intervals noted:

8.1 Daily Operations

- Check for unusual odors or noise that would indicate the motors are running hot.
- Record pump and flow totalizer readings and enter data for record.
- Inspect monitor well recorders.

- Check the pumps, packing, valves, check valves, and motors.
- Perform necessary lubrication as required by the manufacturers.
- Inspect injection wellhead for overall integrity.

8.2 Weekly Operations

- Check motors for excessive heat and unusual odor.
- Check pumps for noise or vibration.
- Manually switch the designated lead and lag pumps if the automatic control system has failed to do so.
- Perform any required lubrication.
- Wipe down all machinery.
- Collect water quality samples for injection wells and monitor wells.
- Collect and record manual water level/pressure readings for the monitor wells.

8.3 Monthly Operations

- Check if all valves can be fully opened and closed.
- Check alarm system.
- Inspect electric motors for wear, noise, over-heating, and loose connections.
- Perform all scheduled maintenance.
- Collect water quality samples for injection wells and monitor wells.
- Inspect all coated surfaces on wells and apply additional coats as necessary.
- Perform specific injectivity testing and computation. This must be completed to avoid possible non-compliance. Therefore, it should not be scheduled at the end of each month.
- Complete and submit monthly reports.

8.4 Quarterly Operations

- Collect water quality samples for injection wells and monitor wells.

8.5 Yearly Operations

- All electrical items should be inspected and calibrated by a qualified electrician.
- Dismantle pumps one at a time. Inspect all parts and replace any worn parts and equipment.
- Perform all scheduled maintenance and review maintenance records to ensure that all scheduled maintenance has been performed.
- Calibrate pressure transducers in monitor wells.
- Review monthly and quarterly monitoring reports for any gradual changes or trends in any of the monitored parameters.
- If necessary based on decline in injection capacity, perform rehabilitation activities such as acidization or high-rate backflushing of the injection wells.

8.6 Electrical Maintenance

Major electrical equipment should be maintained by qualified, experience electricians in accordance with the recommendations of the manufacturer, although plant operators may do some inspection, lubrication, and simple routine maintenance.

The maintenance instructions given in this section are general maintenance of individual pieces of equipment should be performed specifically in accordance with the recommendations of the manufacturer. Operating procedures and unexpected ambient conditions, such as saltwater environment, excessive rain, wind, dust, or vibration may dictate maintenance schedules different from those recommended herein.

Major maintenance requires down-time and partial disassembly of items such as rotating equipment, power circuit breakers, large contractors, and large disconnect switches. Many electrical contractors and some equipment manufacturers will do electrical maintenance on a contract basis.

Working on electrical equipment is dangerous, especially for personnel lacking proper qualifications. The following safety procedures should be used:

1. Have qualified electricians available for all but simple routine maintenance.

2. Before disassembling or working on electrical equipment, make sure the equipment is de-energized.

3. Tag the open breaker or disconnect, and if possible, lock it in the OPEN position.

4. Do not wear loose clothing and ties around rotating machines.

5. When inspecting energized equipment, wear safety glasses to avoid injury to the eyes.

Make a daily walk-through inspection of electrical equipment. Keep the area clean, and look for sources of leaks or unusual heat, noise, or odors. On rotating equipment with sleeve bearings, check oil levels and see that oil rings turn with their shafts. On rotating equipment with slip rings or commutators, check for excessive sparking.

Inspect motors on rotating equipment weekly. See that each shaft is free of oil and/or grease from bearings. Start machines and observe whether they come up to speed in a normal period of time. Check bearings for excessive heat or noise. Check slip rings and commutators for excessive sparking during starting.

Bearings should be lubricated in accordance with the manufacturer's recommendations.

Avoid excessive lubrication, since lubricant contact with insulating surfaces can cause them to deteriorate and collect dirt, thereby decreasing insulation effectiveness.

8.7 Instrumentation and Control (I & C) Maintenance

These maintenance instructions are general. Maintenance of individual pieces of equipment should be performed specifically in accordance with the recommendations of the manufacturer. Operating procedures and ambient conditions of dirt and vibration may dictate maintenance schedules different from those recommended herein.

Modern I & C equipment requires little maintenance if it is kept in the proper environment. If the equipment is chosen and designed properly, it will withstand ambient temperature and dampness and only needs to be kept clean by periodic maintenance.

Every 3 months, open the instruments and/or withdraw them from their cases; inspect the instruments, and clean with a soft brush. Those instruments which have moving parts should be lightly lubricated in accordance with the instructions of the manufacturer. Do not over-lubricate. Check for interferences between moving parts. Look for sources of unusual heat, sound, or odors.

Check calibration semi-annually on instruments, gauges, flow meters, and pressure switches. If possible, they should be calibrated in-place, using the piping, wiring, and fluids of the processes, calibrating the whole sub-system at once. This method is the cheapest and most reliable because it does not require removing the instrument, and it avoids errors such as bad connections and leaks on re-installation. The disadvantages are that it may disrupt the process, and that it may be difficult to obtain sufficient accuracy and range.

Calibrate pressure gauges and pressure switches by connecting a pressure header with a bleed valve and a pressure valve connected to an air tank. Use a gauge of known accuracy and recent calibration for a reference. Check set points of pressure switches on increasing or decreasing pressure. Gauges and pressure switches should be checked semi-annually.

8.8 Injection Well Capacity Restoration

Specific injectivity testing is an important tool used to track an injection well's capacity and overall performance. Details for performing this test are discussed in Section 7. This testing must be conducted monthly. A substantial decline in the Specific Injectivity Index (SII) may require that additional injection well rehabilitation activities are necessary to restore the lost capacity in the well.

If significant injection capacity is lost in the well, and the other more passive techniques are not fully restoring the lost injection capacity, well acidization may be required. Acidization events are commonly performed on other regional deep injection wells utilizing the lower Floridan aquifer approximately every 4 to 5 years. The volume of suspended solids introduced into the well is expected to be a major contributor to the frequent of injection well acidizations required for the City of Clewiston injection wells.

Typically, hydrochloric acid (HCL) is introduced into the injection well to perform the acidizations. Between 5,000 gallons and 15,000 gallons of 19 to 32 percent HCL is commonly used. The acid is typically emplaced, allowed to sit overnight, then the spent acid is removed from the well through an aggressive re-development process. This technique had typically resulted in increasing injection capacities by 50 percent to over 1,000 percent on similar deep injection wells in southwest Florida.

Acidization events typically require that the injection well be taken out of service for several days. Therefore, when one injection well is undergoing rehabilitation, the City of Clewiston facility may use the other injection well for disposal of effluent. Nevertheless, injection well operations staff should be extremely careful to control Total Suspended Solids (TSS) loading to the well and perform routine backflushing as necessary.

8.9 Five Year Mechanical Integrity Testing

A mechanical integrity test (MIT) must be performed on the injection well every five years following the issuance of the operating permit. The last MIT for IW-1 was performed on October 3, 2006. Therefore, the next MIT should be conducted before October 2, 2011. At least six months prior to the MIT, the City of Clewiston staff shall submit to the FDEP South District Office for approval a testing procedure for the mechanical integrity of the injection wells. The plan shall be prepared by a Florida registered Professional Engineer or Professional Geologist, as applicable. The FDEP South District Office shall be notified 72 hours prior to all testing for mechanical

integrity. All testing must be initiated during daylight hours, Monday through Friday. The mechanical integrity testing shall be in accordance with the latest requirements promulgated in Rules 62-528.300 and 62-528.425, F.A.C.

Within 90 days of completion of the MIT program, the City of Clewiston staff shall submit a final report (2 copies) summarizing the results of the testing program to FDEP for review and approval. The MIT report shall be signed and sealed by a Florida registered Professional Engineer or Professional Geologist, as applicable. If the City of Clewiston staff or their consultant determines that a well has failed internal integrity, the MIT report shall include a plan for corrective action for all discovered deficiencies.

Section 9
Safety Procedures

In order to minimize the risk of accidents associated with operation and maintenance of the injection well system, normal City of Clewiston facility and Occupational Safety and Health Administration rules should be observed. The following general rules, although not meant to be comprehensive, are offered:

1) Use a safety helmet, rubber or heavy work gloves, goggles, and protective shoes when working on the injection pumps.

2) Before starting work on pumps, make sure the pumps are isolated from the power supply (including the control circuit) and cannot be energized.

3) Avoid working alone.

4) Make sure that all equipment is in good condition.

5) Have a clear, planned path of egress.

6) Check explosive risk before using welding or electric hand tools.

7) Do not ignore potential health hazards. Observe good personal hygiene in order to prevent irritations to the eyes and skin.

8) If hazardous or irritating fluids get in eyes:

   (a) rinse immediately with running water for 15 minutes;

   (b) contact an eye doctor.

9) If hazardous or irritating fluids get on the skin:

   (a) remove contaminated clothing;

   (b) wash skin with soap and water;

   (c) seek medical treatment if needed.

10) Follow all other health and safety rules and local codes and ordinances.

Section 10
Plug and Abandonment Provisions for Well Obsolescence

At the time the City of Clewiston facility injection well system becomes obsolete, anticipated to be approximately 30 years after initially placed in service, the injection wells, as well as the monitor wells, will be plugged and abandoned according to applicable regulations. The City of Clewiston staff shall notify the FDEP at least 180 days before abandonment of injection well system, unless abandonment within a lesser period of time is necessary to protect the waters of the State. The proposed plugging program is described below.

A qualified hydrogeologic consulting firm and a drilling contractor will be retained to perform the plug and abandonment (P&A) operations. The initial work, prior to mobilizing a drill rig to the site, will consist of retrofitting the well pads with walls to assure that any accidental spillage of injected or formation fluids does not reach the shallow groundwater aquifer at the site.

The wells are in a state of static equilibrium. Therefore, they do not require that the well be "killed". All salvageable wellhead equipment will be dismantled and removed from the site.

Gravel will be emplaced in the open-hole portions of the IW-1 and DZMW-1 to approximately 10 feet below the base of casing. Cement shall be installed from the top of gravel to surface in each of the wells. Cementing operations will be conducted by lowering a one-inch diameter tremie pipe to a depth just above the top of gravel and then pumping neat cement in stages to fill the casings. Cementing operations will be conducted by lowering a one-inch diameter tremie pipe to a depth just above that of the bottom of the open hole and then pumping neat cement in stages to fill the casings.

Aboveground sections of the well will be cut off at land surface and ground level steel monuments identifying the former well locations will be set in cement.

Estimated costs (in March 2007 dollars) for the plugging of the injection wells IW-1 and and DZMW-1 are provided in **Table 10-1**.

The City of Clewiston staff shall retain all records concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under Rule 62-528.435, F.A.C. the City of Clewiston staff shall deliver the records to the FDEP South District Office at the conclusion of the retention period unless City of Clewiston elects to continue retention of the records.

TABLE 10-1
ESTIMATED PLUG AND ABANDONMENT COSTS
CITY OF CLEWISTON WTP FACILITY
INJECTION WELL IW-1 AND
MONITOR WELL DZMW-1

(All costs are in March 2007 dollars)

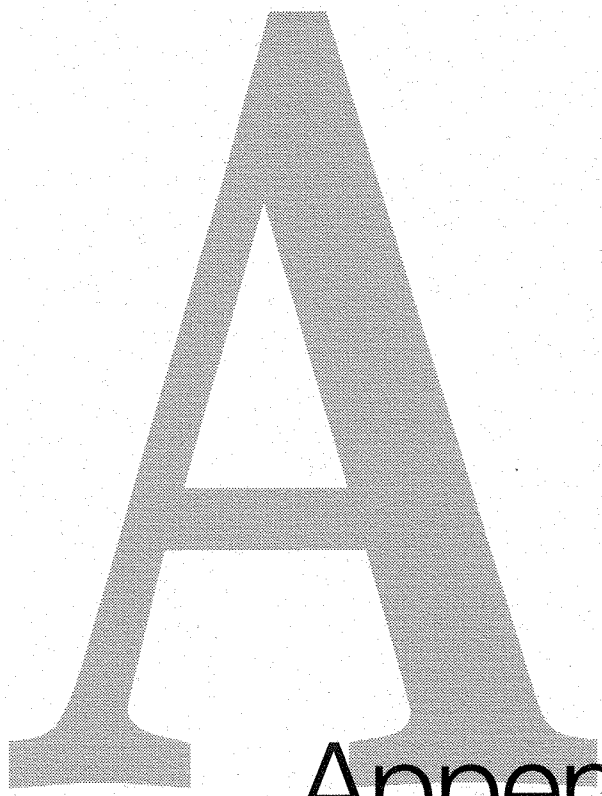
Injection Wells IW-1

Item	Depth Interval (feet)	Unit Cost	Estimated Quantity	Units	Estimated Total Cost
Mobilizing		$60,180	1	L.S.	$60,180
Geophysical Logging		$14,280	1	L.S.	$14,280
Fill open hole with gravel to 10 feet below base of the injection casing	2,759 - 3,505	$12	885	cu.ft.	$10,623
Set bridge plug and cement injection casing to surface	0 - 2,759	$18	1,735	cu.ft.	$31,228
Cut off above ground casing sections, install monument, and rig time		$12,000	1	L.S.	$12,000
				Subtotal	**$128,311**

Monitor Well DZMW-1

Item	Depth Interval (feet)	Unit Cost	Estimated Quantity	Units	Estimated Total Cost
Fill DZMW-1 open hole with gravel to 10 feet below base of the monitor casing	2,142 - 2,200	$12	13	cu.ft.	$160
Cement final casing to surface	0 - 2,142	$18	353	cu.ft.	$6,361
Fill annular space with cement between final & intermediate casings	0 - 2,000	$18	1,110	cu.ft.	$19,979
Cut off above ground casing sections, install monument, and rig time		$8,000	1	L.S.	$8,000
				Subtotal	**$34,500**

20% Contingency	**$32,562**
TOTAL ESTIMATED P&A COSTS	**$195,373**



Appendix A

Appendix A

IW-1 Construction Permit

Department of Environmental Protection

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549

Colleen Castille
Secretary

BY ELECTRONIC MAIL:

In the Matter of an
Application for Permit by:

January 24, 2006

Kevin McCarthy, Utilities Director
City of Clewiston
141 Central Ave.
Clewiston, FL 33440
kevin.mccarthy@clewiston-fl.gov

Hendry County – UIC/IW
FDEP File No. 249635-001-UC
City of Clewiston WTP
Reverse Osmosis IW-1
Class I Injection Well

NOTICE OF PERMIT ISSUANCE

Enclosed is Permit Number 249635-001-UC to construct a Class I Injection Well (IW-1) system, issued pursuant to Section(s) 403.087, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Fort Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Jon M. Iglehart
Director of
District Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT and all copies were mailed before the close of business on January 24, 2006 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section.120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____ _____

Clerk Date

JMI/JBM/rjl

Enclosure

Copies furnished to:

Charles Davault charles.davault@dep.state.fl.us
Frank Brinson brinsonfa@cdm.com
Nancy Marsh marsh.nancy@epa.gov
Steve Anderson sanderso@sfwmd.gov
Ron Reese rsreese@usgs.gov
Joe Haberfeld joe.haberfeld@dep.state.fl.us

Department of Environmental Protection

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549

Colleen Castille
Secretary

BY ELECTRONIC MAIL:

PERMIT

PERMITTEE:

City of Clewiston
141 Central Avenue
Clewiston, FL 33440

Permit/Certification
Number: 249635-001-UC
Date of Issue: January 24, 2006
Expiration Date: January 23, 2011
County: Hendry
Latitude: 26° 43' 25" N
Longitude: 80° 56' 38" W
Section/Town/Range: 28/43S/34E
Project: Clewiston Reverse Osmosis WTP
IW-1 Class I Injection Well

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-528, 62-550, and 62-660. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Construct one nominal 11 inch diameter tubing and packer Class I injection well (IW-1), with cemented 15" steel casing to approximately 2,900 feet below land surface (bls) and a total depth of approximately 3,500 feet bls. Injection is into the Oldsmar Formation for the primary means of disposal of non-hazardous reverse osmosis concentrate from the City of Clewiston Water Treatment Plant (CWTP) for an initial maximum disposal of 0.925 million gallons per day (MGD) at a maximum injection rate of 642 gpm based upon the results of a controlled injection test. The design capacity for the well is 4.05 MGD. The dual zone monitoring well (DZMW-1) will be completed from approximately 1950 to 2000 feet bls and from approximately 2250 to 2300 feet bls.

The Application to Construct/Operate/Abandon Class I, III, or V Injection well System, DEP Form 62-528.900(1), was received May 19, 2005, with supporting documents and additional information last received July 1, 2005. The Certificate of Demonstration of Financial Responsibility was approved October 4, 2005. The project is located at the Clewiston Wastewater Treatment Plant on Feed Lot Road, Hendry County, Florida.

Subject to Specific Conditions 1-14.

SPECIFIC CONDITIONS:

1. GENERAL CRITERIA

a. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

b. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

c. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

d. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.

e. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation or reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

f. When requested by the Department, the permittee shall furnish, within the time specified, any information needed to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

g. Signatories and Certification Requirements

(1) All reports and other submittals required to comply with this permit shall be signed by a person authorized under Rules 62-528.340(1) or (2), F.A.C.

(2) In accordance with Rule 62-528.340(4), F.A.C., all reports shall contain the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

h. The permittee shall notify the Department and obtain approval prior to any physical alterations or additions to the injection or monitor well, including removal of the well head.

i. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity that may result in noncompliance with permit requirements.

j. The permittee shall report any noncompliance that may endanger health or the environment, including:

(1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or

(2) Any noncompliance with a permit condition or malfunction of the injection system which

SPECIFIC CONDITIONS:

may cause fluid migration into or between underground sources of drinking water.

(3) Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

k. No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water.

l. The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under Rule 62-528.435, F.A.C. The permittee shall deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records.

m. If injection is to continue beyond the expiration date of this permit the permittee shall apply for, and obtain an operation permit. If necessary to complete the two-year operational testing period, the permittee shall apply for renewal of the construction permit at least 60 days prior to the expiration date of this permit.

2. Site Requirements

a. A drilling pad shall be provided to collect spillage of contaminants and to support the heaviest load that will be encountered during drilling.

b. The disposal of drilling fluids, cuttings, formation water or waste shall be in a sound environmental manner that avoids violation of surface and ground water quality standards. The disposal method shall be approved by the Department prior to start of construction.

c. Specific drilling pad dimensions and design details shall be provided to and approved by the Department prior to commencing construction (and shortly after selection of drilling contractor).

d. The water table monitoring wells surrounding the injection well and monitor well pads shall be sampled and analyzed prior to drilling this injection well and then weekly thereafter. Sampling shall include specific conductance, pH, chloride, temperature and water level.

e. Pursuant to Rule 62-528.455(1)(c)6., F.A.C., a survey indicating the exact location in metes and bounds of all wells authorized by this permit shall be provided prior to issuance of an operating permit.

3. Construction and Testing Requirements

a. The permittee shall contact the Technical Advisory Committee (TAC) chairman so that he may schedule progress review meetings at appropriate times with the TAC, the U.S. Environmental Protection Agency (USEPA), and permittee for the purpose of reviewing the results of tests, geophysical logging, surveys, drilling records and construction problems.

b. All drilling shall be inside a blow out preventer upon penetration of the Floridan Aquifer.

c. Mechanical integrity testing is a two-part demonstration which includes a pressure test to demonstrate that no leaks are present in the casing, tubing or packer and a temperature or noise log and radioactive tracer survey to

SPECIFIC CONDITIONS:

demonstrate the absence of leaks behind the casing. Verification of pressure gauge calibration must be provided at the scheduled tests.

d. Department approval and Technical Advisory Committee (TAC) and USEPA review pursuant to F.A.C. Rule 62-528 is required for the following stages of construction:

(1) Intermediate casing seat selection for injection and monitor wells.

(2) Final casing seat selection for injection and monitor wells.

(3) Prior to conducting the 12-hour injection test with reclaimed water.

(4) Prior to operational (long term) testing with effluent.

(5) The permittee shall submit all necessary supporting documentation/data, with interpretation, to the TAC and USEPA for review.

e. The cementing program, as required in Section 62-528.410(5), Florida Administrative Code, shall be submitted to the Department, the USEPA, and the Technical Advisory Committee for review. Cementing shall not commence prior to approval being granted.

f. All temperature surveys (except for mechanical integrity demonstration) shall be run within 48 hours after cementing.

g. TAC meetings are scheduled on the 1st Tuesday of each month subject to a 5 working day prior notice and timely receipt of critical data by all TAC members and the USEPA. Emergency meetings may be arranged when justified to avoid undue construction delay.

h. The Permittee shall insure that safe internal pressures are maintained during the cementing of all casings.

i. The background water quality of the injection zone and monitoring zones shall be established prior to commencement of any injection testing. Parameters to be measured are the primary and secondary drinking water standards (except asbestos, dioxin, epichlorhydrin, and acrylamide) and the minimum criteria for municipal effluent.

j. The injection and monitor well(s) at the site shall be abandoned when no longer usable for their intended purpose, or when posing potential threat to the quality of the waters of the State. Within 180 days of well abandonment, the permittee shall submit to the Department, the USEPA, and the TAC the proposed plugging method, pursuant to Rule 62-528.435, F.A.C.

k. All salt used in well drilling shall be stored in an environmentally sound manner. Accurate records shall be kept on the amount of salt used.

l. All dual induction, sonic and caliper geophysical logs run on the pilot holes of the injection well and monitor wells shall be submitted with scales of one inch equals one hundred feet (1"=100'), two inches equals one hundred feet (2"=100'), and five inches equals one hundred feet (5"=100')

m. An engineering drawing showing the drill pad construction (including material used) and locations of the injection well, dual zone monitor well, and the water table monitor wells shall be provided for Department approval prior to pad construction and well construction.

4. Quality Assurance/Quality Control Requirements

SPECIFIC CONDITIONS:

a. This permit approval is based upon evaluation of the data contained in the application dated March 12, 2003, and the plans and/or specifications submitted in support of the application. Any proposed modifications to this permit shall be submitted in writing to the Underground Injection Control program manager, the TAC, and USEPA for review and clearance prior to implementation. Changes of negligible impact to the environment and staff time will be reviewed by the program manager, cleared when appropriate and incorporated into this permit. Changes or modifications other than those described above will require submission of a completed application and appropriate processing fee as per Rule 62-4.050, F.A.C.

b. A professional engineer registered pursuant to Chapter 471, Florida Statutes shall be retained throughout the construction period to be responsible for the construction operation and to certify the application, specifications, completion report and other related documents. The Department shall be notified immediately of any change of engineer.

c. Where required by Chapter 471 (P.E.) or Chapter 492 (P.G.) F.S., applicable portions of permit applications and supporting documents that are submitted to the Department for public record shall be signed and sealed by the professional(s) who approved or prepared them.

d. The Department shall be notified immediately of any problems that may seriously hinder compliance with this permit, construction progress, or good construction practice. The Department may require a detailed written report describing the problem, remedial measures taken to assure compliance and measures taken to prevent recurrence of the problem.

e. Issuance of a Class I Test/Injection well construction and testing permit does not obligate the Department to authorize operation of the injection well system, unless the wells qualify for an operation permit applied for by the permittee and issued by the Department.

5. Reporting Requirements

a. All reports and surveys required by this permit must be submitted concurrently to all the members of the TAC and the USEPA. The TAC and USEPA consists of representatives from these agencies:

Florida Department of Environmental Protection
South District
P.O. Box 2549
Fort Myers, FL 33902-2549

Florida Department of Environmental Protection
Bureau of Water Facilities Regulation
UIC Program, MS 3530
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

South Florida Water Management District
P.O. Box 24860
West Palm Beach, FL 33416-4860

United States Environmental Protection Agency, Region IV
UIC Section
61 Forsythe Street, SW
Atlanta, Georgia 30303-8909

United States Geological Survey
9100 NW 36th Street, Suite 107
Miami, FL 33178

SPECIFIC CONDITIONS:

b. Members of the TAC and the USEPA shall receive a weekly summary of the daily log kept by the contractor. The reporting period shall run for seven (7) days and reports shall be mailed within 48 hours of the last day of the reporting period. The report shall include but is not limited to the following:

(1) Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used;

(2) Description of formation and depth encountered; and specific conductance of water samples collected during drilling. Description of work during installation and cementing of casings; include amounts of casing and actual cement used versus calculated volume required.

(3) Lithological description of drill cuttings collected every ten (10) feet or at every change in formation. Description of work and type of testing accomplished, geophysical logging, pumping tests, deviation survey results, and coring results.

(4) Description of any construction problems that develop and their status to include a description of what is being done or has been done to correct the problem.

(5) Description of the amount of salt used.

(6) Results of any water quality analyses performed as required by this permit, including pad monitor wells

(7) Copies of the driller's log are to be submitted with the weekly summary.

c. The Department must be notified seventy-two (72) hours prior to all testing for mechanical integrity on the injection well. Testing should begin during daylight hours Monday through Friday.

d. Annotated copies of geophysical logs, lithologic descriptions and logs and water quality data (from drilling and packer tests) must be submitted to TAC and the USEPA, with interpretation, for intermediate and final casing seat selection approvals by the Department.

e. An interpretation of all test results must be submitted with all test data and geophysical logs.

f. After completion of construction and testing, a final report, certified by a P.E. and P.G., shall be submitted to the Department, the TAC, and the USEPA. The report shall include, but not be limited to, all information and data collected under Rule 62-528.450(2) and Rule 62-528.450(3), F.A.C., with appropriate interpretations. Mill certificates for the casing(s) shall be included in this report. To the extent possible, the transmissivity of the injection zone and maximum injection rate within safe pressure limits shall be estimated.

6. The construction permit includes a period of temporary injection operation for the purposes of long term testing. Prior to commencement of operational testing:

a. Construction of the injection well shall be complete and the permittee shall submit a notice of completion of construction certified by a P.E. to the Department.

b. Each well shall first be tested for integrity of construction, and shall be followed by a short-term injection test of such duration to allow for the prediction of the operating pressure.

c. The permittee shall submit the following information to each member of the Technical Advisory Committee:

(1) A copy of the borehole television survey(s)

SPECIFIC CONDITIONS:

(2) Geophysical logs

(3) Mechanical integrity test data

(4) Data obtained during the short term injection testing conducted pursuant to Rules 62-528.405(3)(a) and 62-528.410(7)(e), and 62-528.450(3)(a)2., F.A.C.

(5) Confining zone data

(6) Background water quality data for the injection and monitor zones

(7) Wastestream analysis

(8) As-built well construction specifications

(9) Draft operation and maintenance manual with emergency procedures

(10) Other data obtained during well construction needed by the Department to evaluate whether the well will operate in compliance with Department rules.

d. The emergency discharge method shall be fully operational and no emergency discharge shall occur until the permittee has obtained all necessary permits.

e. Any corrective action required under Rule 62-528.300(5)(c)2., F.A.C., has been completed.

f. Written authorization shall be obtained from the Department. Authorization shall be for up to two years or the expiration date of the construction permit, whichever is less, and is nonrenewable. The authorization shall specify the conditions under which operational testing is approved. The authorization shall include:

(1) Injection pressure limitation

(2) Injection flow rate limitation

(3) Monthly specific injectivity testing

(4) Reporting requirements, and

(5) An expiration date for the operational testing period not to exceed two years.

g. Before authorizing operational testing the Department shall conduct an inspection of the facility to determine if the conditions of the permit have been met.

7. Operational Testing Requirements

a. Operational Testing Conditions - Injection Well System

(1) The injection system shall be monitored in accordance with rule 62-528.425(1)(g) and 62-528.430(2), F.A.C.

(2) The following injection well performance data shall be recorded and reported at the frequency indicated from the injection well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
The permittee shall use continuous indicating and recording devices to monitor injection flow rate and injection pressure and annular pressure. In the case of operational failure of any of these instruments for a period of more

SPECIFIC CONDITIONS:

than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

INJECTION WELL IW-1. The proposed specifications for the injection wells are as follows:

Casing Diameter (OD)	Depth (bls) Cased	Open Hole (bls)
48"Steel	250'	
36"Steel	1000'	
26" Steel	2100'	
16" Steel	2900'	
11.2" FRP Tbg	2850'	2850-3500'

Parameters	Reporting Frequency
Injection Pressure (p.s.i)	Daily/Monthly
Maximum Injection Pressure	Daily/Monthly
Minimum Injection Pressure	Daily/Monthly
Average Injection Pressure	Daily/Monthly
Flow Rate (g.p.m.)	Daily/Monthly
Maximum Flow Rate	Daily/Monthly
Average Flow Rate	Daily/Monthly
Minimum Flow Rate	Daily/Monthly
Annular Pressure (p.s.i.)	Daily/Monthly
Maximum Annular Pressure	Daily/Monthly
Minimum Annular Pressure	Daily/Monthly
Average Annular Pressure	Daily/Monthly
Annular Fluid added/removed (gallons)	Daily/Monthly
Annular Pressure added/removed (p.s.i.)	Daily/Monthly
Total Volume WTP Concentrate Injected (gallons)	Daily
Total Volume WTP Concentrate Injected (gallons)	Monthly

Injectate Water Quality

WTP Concentrate Water Quality

TKN (mg/L)	Monthly
pH (std. units)	Monthly
Specific Conductance (µmhos/cm)	Monthly
Chloride (mg/L)	Monthly

Sulfate (mg/L)	Monthly
Field Temperature (deg. C)	Monthly
Total Dissolved Solids (mg/L)	Monthly
Sodium (mg/L)	Monthly
Calcium (mg/L)	Monthly
Potassium (mg/L)	Monthly

SPECIFIC CONDITIONS:

Magnesium (mg/L)	Monthly
Iron (mg/L)	Monthly
Bicarbonate (mg/L)	Monthly
Gross Alpha	Monthly
Radium 226	Monthly
Radium 228	Monthly
Primary and Secondary Drinking Standards**	

** These analyses shall be provided prior to operational testing or testing with concentrate.

b. Operational Testing Conditions - Monitor Well System.

(1) The monitor well system will consist of one Dual Zone Monitor Well as described below:

Well Number	Casing Dia. (OD)	Depth (bls) Cased	Open Hole(bls)
DZMW-1	28" Steel	250'	
	20" Steel	1000'	
	12.75" Steel	1950'	1950-2000'
	6.46" FRP	2250'	2250-2300'

(2) All monitor wells shall be monitored in accordance with rule 62-528.425 and 62-528.430, F.A.C. The following monitor well performance data shall be recorded and reported at the frequency indicated from the monitor well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall use continuous indicating and recording devices to monitor the monitor zone pressures or water levels. In the case of operational failure of any of these instruments for a period of more than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

DZMW-1 Parameters	Reporting Frequency
Maximum Water Level/Pressure (Ft. NGVD/psi)	Daily/Monthly
Minimum Water Level/Pressure	Daily/Monthly
Average Water Level/Pressure	Monthly

Water Quality

TKN (mg/L)	Weekly
Specific Conductance (µmhos/cm)	Weekly
Total Dissolved Solids (mg/L)	Weekly
pH (std. units)	Weekly

Chloride (mg/L)	Weekly
Sulfate (mg/L)	Weekly
Field Temperature (°C)	Weekly
Sodium (mg/L)	Monthly
Calcium (mg/L)	Monthly
Potassium (mg/L)	Monthly

SPECIFIC CONDITIONS:

Magnesium (mg/L)	Monthly
Iron (mg/L)	Monthly
Bicarbonate (mg/L)	Monthly
Gross Alpha	Monthly (deep monitor zone only)
Radium 226	Monthly (deep monitor zone only)
Radium 228	Monthly (deep monitor zone only)

(3) Water quality data may be reduced to monthly analyses after a minimum six months of data if the conditions of Rule 62-528.450(3)(d), F.A.C., have been met and with Department approval.

c. The permittee shall calibrate all pressure gauge(s), flow meter(s), chart recorder(s), and other related equipment associated with the injection well system on a semi-annual basis. The permittee shall maintain all monitoring equipment and shall ensure that the monitoring equipment is calibrated and in proper operating condition at all times. Laboratory equipment, methods, and quality control will follow EPA guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauge(s), flow meter(s), and chart recorder(s) shall be calibrated using standard engineering methods.

d. The permittee shall submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the last day of the month immediately following the month of record. The results shall be sent to the Department of Environmental Protection, P.O. Box 2549, Fort Myers, Florida 33902-2549. A copy of this report shall also be sent to the Department of Environmental Protection, Underground Injection Control Program, MS 3530, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

e. The Engineer of Record or designated qualified representative must be present for the start-up operations and the Department must be notified in writing of the date operational testing commenced for the well.

8. Abnormal Events

a. In the event the permittee is temporarily unable to comply with any conditions of this permit due to breakdown of equipment, power outages, destruction by hazard of fire, wind, or by other cause, the permittee shall notify the Department. Notification shall be made in person, by telephone or by electronic mail within 24 hours of breakdown or malfunction to the UIC Program staff, South District office.

b. A written report of any noncompliance referenced in 1) above shall be submitted to the South District office within five days after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions.

9. Emergency Disposal

a. All applicable federal, state and local permits must be in place to allow for any alternate discharges due to emergency or planned outage conditions.

b. Any changes in emergency disposal methods must be submitted for Technical Advisory Committee (TAC) and USEPA review and Department approval.

c. The permittee shall notify the Department within 24 hours whenever an emergency discharge has occurred (Rule 62-528.415(4)(c)1., F.A.C.). Written notification shall be provided to the Department within 5 days after each occurrence. The Permittee shall indicate the location and duration of the discharge and the volume of fluid discharged.

10. Financial Responsibility

SPECIFIC CONDITIONS:

a. The permittee shall maintain the resources necessary to close, plug and abandon the injection and associated monitor wells, at all times (Rule 62-528.435(9), F.A.C.).

b. The permittee shall review annually the plugging and abandonment cost estimates. The permittee shall resubmit documentation necessary to demonstrate financial responsibility using the revised cost estimates on or before March 31 of each year.

c. In the event that the mechanism used to demonstrate financial responsibility should become invalid for any reason, the permittee shall notify the Department of Environmental Protection in writing within 14 days of such invalidation. The permittee shall, within 30 days of said notification, submit to the Department for approval, new financial documentation in order to comply with Rule 62-528.435(9), F.A.C., and the conditions of this permit.

11. Mechanical Integrity

a. Injection is prohibited until the permittee affirmatively demonstrates that the well has mechanical integrity. Prior to operational testing the permittee shall establish, and thereafter maintain, mechanical integrity of the well at all times.

b. If the Department determines that the injection well lacks mechanical integrity, written notice shall be given to the permittee.

c. Unless the Department requires the immediate cessation of injection, within 48 hours of receiving written notice from the department that the well lacks mechanical integrity the permittee shall cease injection into the well unless the Department allows continued injection pursuant to (d) below.

d. The Department may allow the permittee to continue operation of a well that lacks mechanical integrity if the permittee demonstrates that fluid movement into or between underground sources of drinking water is not occurring.

12. The permittee is reminded of the necessity to comply with the pertinent regulations of any other regulatory agency, as well as any county, municipal, and federal regulations applicable to the project. These regulations may include, but not limited to, those of the Federal Emergency Management Agency in implementing flood control measures. This permit should not be construed to imply compliance with the rules and regulations of other regulatory agencies.

13. The permittee shall be aware of and operate under the general conditions in Rule 62-528.307(1)(a) through (x) and Rule 62-528.307(2)(a) through (f), F.A.C. These general conditions are binding upon the permittee and enforceable pursuant to Chaper 403 of the Florida Statutes.

14. In order to add municipal effluent to the wastestream, the permittee must submit an application for either a major permit modification or a new construction permit depending on the time remaining of the two year time limitation for operational testing (Rule 62-528.450(3)(b), F.A.C.).
Note: In the event of an emergency the permittee shall contact the Department by calling (850) 488-1320. During normal business hours, the permittee shall call (239) 332-6975.

PERMITTEE:
City of Clewiston

Permit/Cert. No.: 249635-001-UC
Date of Issue: January 24, 2006
Expiration Date: January 23, 2011

SPECIFIC CONDITIONS:

Issued this 24th day of January

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Jon M. Iglehart
Director of
District Management

JMI/JBM/rjl

Appendix B

Appendix B

Emergency Contact List

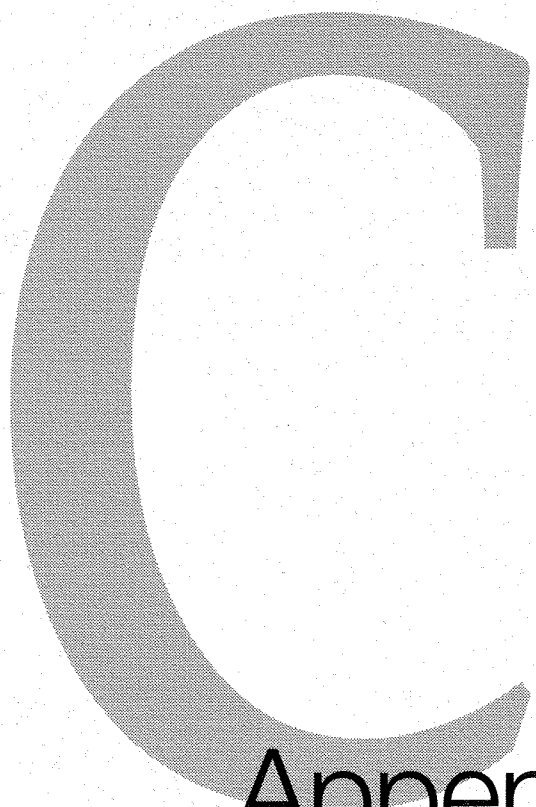
City of Clewiston
Water Treatment Plan Injection Well System
Emergency Contact List

Utilities Department Main Contact Line: 863-983-1454
Telephone number will rollover to page whomever is on call

Kevin McCarthy
Utilities Director

Terry Lowman

Veolia Water North America operator staff



Appendix C

Appendix C

FDEP Standard Operating Procedures

FS 2200. Groundwater Sampling

1. INTRODUCTION AND SCOPE

1.1. Use these Standard Operating Procedures to collect groundwater samples. They are designed to ensure that the collected samples will be representative of water in the aquifer or target formation and that the samples have not been altered or contaminated by the sampling and handling procedures. These procedures apply to permanently and temporarily installed monitoring wells, wells with installed plumbing, remedial groundwater treatment systems and excavations where groundwater is present. Use of alternative, FDEP-approved and properly documented procedures (e.g., Corporate SOP, ASTM Standards, alternative equipment, etc.) is acceptable if they meet the intent (e.g., sample representativeness and integrity) of this standard (see FA 1000).

1.2. The topics in this SOP include equipment and supply selection, equipment construction materials, and purging and sampling techniques.

1.3. Use the following FDEP SOPs in conjunction with FS 2200:

- FA 1000 Regulatory Scope and Administrative Procedures for Use of DEP SOPs
- FC 1000 Cleaning/Decontamination Procedures
- FD 1000 Documentation Procedures
- FQ 1000 Field Quality Control Requirements
- FS 1000 General Sampling Procedures
- FS 2000 General Aqueous Sampling
- FT 1000 Field Testing and Measurement

1.4. Groundwater samples may be collected from a number of different configurations. Each configuration is associated with a unique set of sampling equipment requirements and techniques:

1.4.1. Wells without Plumbing: These wells require that equipment be brought to the well to purge and sample unless dedicated equipment is placed in the well.

1.4.2. Wells with In-Place Plumbing: Wells with in-place plumbing do not require that equipment be brought to the well to purge and sample. In-place plumbing is generally considered permanent equipment routinely used for purposes other than purging and sampling, such as for water supply. They are generally found at wellfields, industrial facilities, and private residences. See FS 2300 for procedures to sample potable water wells.

1.4.3. Air Strippers or Remedial Systems: These types of systems are installed as remediation devices. Sample these wells like drinking water wells (see FS 2300).

FS 2201. Equipment and Supplies

Use groundwater purging and sampling equipment constructed of only non-reactive, non-leachable materials that are compatible with the environment and the selected analytes. In selecting groundwater purging and sampling equipment, give consideration to the depth of the well, the depth to groundwater, the volume of water to be evacuated, the sampling and purging

technique, and the analytes of interest. Refer to Tables FS 1000-1, FS 1000-2, FS 1000-3 and FS 2200-1 for selection of appropriate equipment.

Additional supplies such as reagents, preservatives, and field measurement equipment may be necessary.

1. FLOW CONTAINER: FDEP recommends using a flow-through cell or container when collecting measurements for purging stabilization. The design must ensure that fresh formation water continuously contacts the measuring devices and does not aerate the sample or otherwise affect the groundwater properties.

2. PUMPS: All pumps or pump tubing must be lowered and retrieved from the well slowly and carefully to minimize disturbance to the formation water. This is especially critical at the air/water interface. Avoid the resuspension of sediment particles (turbidity) at the bottom of the well or adhered to the well casing during positioning of the pump or tubing.

2.1. Above-Ground Pumps

2.1.1. Variable Speed Peristaltic Pump: Use a variable speed peristaltic pump to purge groundwater from wells when the static water level in the well is no greater than 20-25 feet below land surface (BLS). If the water levels are deeper than 18-20 feet BLS, the pumping velocity will decrease.

2.1.1.1. A variable speed peristaltic pump can be used for normal purging and sampling (see FS 2213 and FS 2221), sampling low permeability aquifers or formations (see FS 2222) and collecting filtered groundwater samples (see FS 2225, section 1).

2.1.1.2. Most analyte groups can be sampled with a peristaltic pump if the tubing and pump configurations are appropriate. See Table FS 1000-3 for proper tubing selection and pump configurations.

2.1.2. Variable Speed Centrifugal Pump: A variable speed centrifugal pump can be used to purge groundwater from 2-inch and larger internal diameter wells. **Do not use** this type of pump to collect groundwater samples.

2.1.2.1. When purging is complete, do not allow the water that remains in the tubing to fall back into the well. Install a check valve at the end of the purge tubing, and withdraw the tubing slowly from the well while the pump is still running.

2.1.2.2. See Table FS 1000-3 for proper tubing selection and allowable analyte groups.

2.2. Submersible Pumps

2.2.1. Variable Speed Electric Submersible Pump: A variable speed submersible pump can be used to purge and sample groundwater from 2-inch and larger internal diameter wells.

2.2.1.1. A variable speed submersible pump can be used for normal purging and sampling (see FS 2213 and FS 2221), sampling low permeability aquifers or formations (see FS 2222) and collecting filtered groundwater samples (see FS 2225, section 1).

2.2.1.2. Make sure that the pump housing, fittings, check valves and associated hardware are constructed of stainless steel. Make sure that any other materials are compatible with the analytes of interest. See Table FS 1000-3 for restrictions.

2.2.1.3. Install a check valve at the output side of the pump to prevent backflow.

2.2.1.4. If purging **and** sampling for organics:

- The entire length of the delivery tube must be Teflon, Polyethylene or Polypropylene (PP) tubing.
- The electrical cord must be sealed in Teflon, Polyethylene or PP and any cabling must be sealed in Teflon, Polyethylene or PP, or be constructed of stainless steel.
- All interior components that contact the sample water (impeller, seals, gaskets, etc.) must be constructed of stainless steel or Teflon.

2.2.2. Variable Speed Bladder Pump: A variable speed positive displacement bladder pump (no-gas contact) can be used to purge and sample groundwater from 3/4-inch and larger internal diameter wells.

2.2.2.1. A variable speed bladder pump can be used for normal purging and sampling (see FS 2213 and FS 2221), sampling low permeability aquifers or formations (see FS 2222) and collecting filtered groundwater samples (see FS 2225, section 1).

2.2.2.2. The bladder pump system is composed of the pump, the compressed air tubing, the water discharge tubing, the controller and a compressor or compressed gas supply.

2.2.2.3. The pump consists of a bladder and an exterior casing or pump body that surrounds the bladder and two (2) check valves. These parts can be composed of various materials, usually combinations of polyvinyl chloride (PVC), Teflon, Polyethylene, PP and stainless steel. Other materials must be compatible with the analytes of interest. See Table FS 1000-3 for restrictions.

2.2.2.4. If purging and sampling for organics:

- The pump body must be constructed of stainless steel and the valves and bladder must be Teflon, Polyethylene or PP.
- The entire length of the delivery tube must be Teflon, Polyethylene or PP.
- Any cabling must be sealed in Teflon, Polyethylene or PP, or be constructed of stainless steel.

2.2.2.5. Permanently installed pumps may have a PVC pump body as long as the pump remains in contact with the water in the well.

3. BAILERS:

3.1. Purging: FDEP does not recommend using bailers for purging unless no other equipment can be used or purging with a bailer has been specifically authorized by an FDEP program, permit, contract or order (see Table FS 2200-3). Use a bailer if there is non-aqueous phase liquid (free product) in the well or non-aqueous phase liquid is suspected to be in the well. If in doubt about the appropriateness of using a bailer at a site or during a particular sampling event, contact the appropriate FDEP program or project manager. If a bailer is used, follow FS 2213, section 4, with no deviations.

3.2. Sampling: Bailers may be used to routinely collect some analyte groups or under specific circumstances for other analyte groups (see Table FS 2200-3).

3.3. Construction and Type:

3.3.1. Bailers must be constructed of materials compatible with the analytes of interest. See Table FS 1000-3 for restrictions.

3.3.1.1. Stainless steel, Teflon, Polyethylene and PP bailers may be used to sample all analytes.

3.3.2. Use disposable bailers when sampling grossly contaminated sample sources.

3.3.3. FDEP recommends using dual check valve bailers when collecting samples.

3.3.4. Use bailers with a controlled flow bottom when collecting volatile organic samples.

3.3.5. Use bailers that can be pressurized when collecting filtered samples for metals.

3.4. Contamination Prevention:

3.4.1. Keep the bailer wrapped (foil, butcher paper, etc.) until just before use.

3.4.2. Use protective gloves to handle the bailer once it is removed from its wrapping.

3.4.3. Handle the bailer by the lanyard to minimize contact with the bailer surface.

4. LANYARDS

4.1. Lanyards must be made of non-reactive, non-leachable material. They may be cotton twine, nylon, stainless steel, or may be coated with Teflon, Polyethylene or PP.

4.2. Discard cotton twine, nylon, and non-stainless steel braided lanyards after sampling each monitoring well.

4.3. Decontaminate stainless steel, coated Teflon, Polyethylene and PP lanyards between monitoring wells (see FC 1003). They do not need to be decontaminated between purging and sampling operations.

FS 2210. GROUNDWATER PURGING

FS 2211. Water Level and Purge Volume Determination

Collect representative groundwater samples from the aquifer. The amount of water that must be purged from a well is determined by the volume of water and/or field parameter stabilization.

1. GENERAL EQUIPMENT CONSIDERATIONS

1.1. Selection of appropriate purging equipment depends on the analytes of interest, the well diameter, transmissivity of the aquifer, the depth to groundwater and other site conditions.

1.2. Use a pump to purge the well unless no other equipment can be used or there is non-aqueous phase liquid in the well or non-aqueous phase liquid is suspected to be in the well.

1.3. Bailers may be used if approved by an FDEP program, or if bailer use is specified in a permit, contract or FDEP order (see Table FS 2200-3). If used, bailers must be of appropriate type and construction, and the user must follow the procedure outlined in FS 2213, section 4, with no deviations. If in doubt about the appropriateness of using a bailer at a site or during a particular sampling event, contact the appropriate FDEP program or project manager. FDEP does not recommend using bailers because improper bailing:

1.3.1. Introduces atmospheric oxygen which may precipitate metals (i.e., iron) or cause other changes in the chemistry of the water in the sample (i.e., pH)

1.3.2. Agitates groundwater which may bias volatile and semi-volatile organic analyses due to volatilization

1.3.3. Agitates the water in the aquifer and resuspends fine particulate matter

1.3.4. Surges the well loosening particulate matter in the annular space around the well screen

1.3.5. May introduce dirt into the water column if the sides of the casing wall are scraped

2. INITIAL INSPECTION

2.1. Verify the identification of the monitoring well by examining markings, sign plates, placards or other designations.

2.2. Remove the well cover and remove all standing water around the top of the well casing (manhole) before opening the well cap.

2.3. Inspect the exterior protective casing of the monitoring well for damage and document the results of the inspection if there is a problem.

2.4. It is recommended that you place a protective covering around the well head. Replace the covering if it becomes soiled or ripped.

2.5. Inspect the well lock and determine whether the cap fits tightly. Replace the cap if necessary.

3. WATER LEVEL MEASUREMENTS: Use an electronic probe or chalked tape to determine the water level.

3.1. Decontaminate all equipment before use.

3.2. Measure the depth to groundwater from the top of well casing to the nearest 0.01 foot and always measure from the same reference point or survey mark on the well casing. If there is no reference mark, measure from the north side of the casing.

3.3. Record the measurement and the reference point.

3.4. Electronic Probe

3.4.1. Follow the manufacturer's instructions for use.

3.4.2. Record the measurement.

3.5. Chalked Line Method: This method is not recommended if collecting samples for organic or inorganic parameters.

3.5.1. Lower chalked tape into the well until the lower end is in the water (usually determined by the sound of the weight hitting the water).

3.5.2. Record the length of the tape relative to the reference point (see section 3.2 above).

3.5.3. Quickly remove the tape from the well.

3.5.4. Record the length of the wetted portion to the nearest 0.01 foot.

3.5.5. Determine the depth to water by subtracting the length of the wetted portion (see section 3.5.3 above) from the total length (see section 3.5.2 above). Record the result.

4. WATER COLUMN DETERMINATION

Do not determine the total depth of the well by lowering the probe to the bottom of the well before purging and sampling. If the well must be sounded, delay purging and sampling activities for at least 24 hours after the well was sounded or for a time sufficient to meet the purge stabilization criterion for turbidity. Alternatively, collect samples before sounding the well.

4.1. Subtract the depth to the top of the water column from the total well depth to determine the length of the water column.

4.2. The total well depth depends on the well construction. Some wells may be drilled in areas of sinkhole or karst formations or rock leaving an open borehole. Attempt to find the total borehole depth in cases where there is an open borehole below the cased portion.

5. WELL WATER VOLUME

5.1. Calculate the total volume of water in gallons in the well using the following equation:

V = (0.041)d x d x h

Where: V = volume in gallons
d = well diameter in inches
h = height of the water column in feet

5.2. The total volume of water in the well may also be determined with the following equation by using a casing volume per foot factor (Gallons per Foot of Water) for the appropriate diameter well:

V = [Gallons per Foot of Water] x h

Where: V = volume in gallons
h = height of the water column in feet

Casing Internal Diameter	Approximate Gallons per Foot of Water
0.75"	0.02
1"	0.04
1.25"	0.06
2"	0.16
3"	0.37
4"	0.65
5"	1.02
6"	1.47
12"	5.88

5.3. Record all measurements and calculations in the field records.

6. PURGING EQUIPMENT VOLUME

6.1. Calculate the total volume of the pump, associated tubing and container that is used for in situ measurements (flow container), if used, using the following equation:

$$V = p + ((0.041)d \times d \times l) + fc$$

Where: V = volume in gallons
p = volume of pump in gallons
d = tubing diameter in inches
l = length of tubing in feet
fc = volume of flow cell in gallons

7. When collecting samples from multiple wells on a site, if the groundwater elevation data are to be used to construct groundwater elevation contour maps, all water level measurements must be taken within the same 24-hour time interval unless a shorter time period is required by a FDEP program. If the site is tidally influenced, complete the water level measurements within the time frame of an incoming or outgoing tide.

FS 2212. Well Purging Techniques

The selection of the purging technique and equipment is dependent on the hydrogeologic properties of the aquifer, especially depth to groundwater and hydraulic conductivity. The intent of proper purging is to stabilize the water level in the well and minimize the hydraulic stress to the hydrogeologic formation.

Every attempt must be made to match the pumping rate with the recharge rate of the well before evaluating the purging completion criteria.

A flowchart which summarizes purging procedure options is in Figure FS 2200-2.

Equipment selection must comply with construction and configuration requirements specified in Table FS 2200-1 and the discussions in FS 2201.

1. MEASURING THE PURGE VOLUME: The volume of water that is removed during purging must be recorded. Therefore, you must measure the volume during the purging operation.

1.1. Collect the water in a graduated container and multiply the number of times the container was emptied by the volume of the container, or

1.2. Estimate the volume based on pumping rate. This technique may be used only if the pumping rate is constant. Determine the pumping rate by measuring the amount of water that is pumped for a fixed period of time or use a flow meter.

1.2.1. Calculate the amount of water that is discharged per minute:

$$D = \frac{\text{Measured amount}}{\text{Total time in minutes}}$$

1.2.2. Calculate the time needed to purge one (1) well volume or one (1) purging equipment volume:

$$\text{Time} = \frac{V}{D}$$

Where: V = well volume determined from FS 2211, section 5, or purging equipment volume
D = discharge rate calculated in section 1.2.1. above

1.2.3. Make new measurements (see section 1.2.1 above) each time the pumping rate is changed, or

1.3. Use a totalizing flow meter.

1.3.1. Record the reading on the totalizer prior to purging.

1.3.2. Record the reading on the totalizer at the end of purging.

1.3.3. Subtract the reading on the totalizer prior to purging from the reading on the totalizer at the end of purging to obtain the volume purged.

1.4. Record in the field records the times that purging begins and ends.

2. STABILIZATION MEASUREMENT FREQUENCY

Begin to record stabilization measurements after pumping the minimum volume as prescribed below. Every attempt must be made to match the pumping rate with the recharge rate of the well before evaluating the purging criteria.

If the well screened interval is not known, use option 2.1 below.

2.1. Wells with Fully Submerged Screen and Pump or Intake Tubing Placed at the Top of the Water Column (conventional purge): Purge a minimum of one (1) well volume prior to collecting measurements of the field parameters. Allow at least one quarter (1/4) well volume to purge between subsequent measurements.

2.2. Wells with Fully Submerged Screen and Pump or Intake Tubing Placed Within the Screened Interval (minimizing purge volume): Purge until the water level has stabilized (well recovery rate equals the purge rate), then purge a minimum of one (1) volume of the pump, associated tubing and flow container (if used) prior to collecting measurements of the field parameters. Take measurements of the field parameters no sooner than two (2) to three (3) minutes apart. Purge at least three (3) volumes of the pump, associated tubing and flow container, if used, prior to collecting a sample.

2.3. Wells with a Partially Submerged Well Screen: Purge a minimum of one (1) well volume prior to collecting measurements of the field parameters. Take measurements of the field parameters no sooner than two (2) to three (3) minutes apart.

3. PURGING COMPLETION: DEP recommends the use of a flow-through container to measure the stabilization parameters discussed below. Alternatively, measure all parameters *in situ* by inserting measurement probes into the well at the depth appropriate for the purging option. Purging is considered complete if the criteria in section 3.1, 3.2 or 3.3 below are satisfied. Make every attempt to satisfy the criteria in section 3.1. Every attempt must be made to match the pumping rate with the recharge rate of the well before evaluating the purging criteria.

3.1. Three (3) consecutive measurements of the five (5) parameters listed below must be within the stated limits. The measurements evaluated must be the last three consecutive measurements taken before purging is stopped. The range between the highest and the lowest values for the last three measurements of temperature, pH and specific conductance cannot exceed the stated limits. The last three consecutive measurements of dissolved oxygen and turbidity must all be at or below the listed thresholds.

- Temperature: ± 0.2° C
- pH: ± 0.2 Standard Units
- Specific Conductance: ± 5.0% of reading
- Dissolved Oxygen: ≤20% Saturation
- Turbidity: ≤20 NTU

Document and report the following, as applicable, except that the last four (4) items only need to be submitted once:

- Purging rate.
- Drawdown in the well, if any.
- Pump or tubing intake placement.
- Length and location of the screened interval.
- A description of the process and the data used to design the well.
- The equipment and procedure used to install the well.
- The well development procedure.
- Pertinent lithologic or hydrogeologic information.

3.2. If the criteria in section 3.1 above for dissolved oxygen and/or turbidity cannot be met, then three (3) consecutive measurements of the five (5) parameters listed below must be within the stated limits. The measurements evaluated must be the last three consecutive measurements taken before purging is stopped. The range between the highest and the lowest values for the last three measurements cannot exceed the stated limits.

- Temperature: + 0.2° C
- pH: ± 0.2 Standard Units
- Specific Conductance: ± 5.0% of reading
- Dissolved Oxygen: ± 0.2 mg/L or 10%, whichever is greater
- Turbidity: ± 5 NTUs or 10%, whichever is greater

Additionally, document and report the following, as applicable, except that the last four (4) items only need to be submitted once:

- Purging rate.
- Drawdown in the well, if any.
- Pump or tubing intake placement.
- Length and location of the screened interval.
- A description of conditions at the site that may cause the Dissolved Oxygen to be high and/or Dissolved Oxygen measurements made within the screened or open hole portion of the well with a downhole dissolved oxygen probe.
- A description of conditions at the site that may cause the Turbidity to be high and any procedures that will be used to minimize Turbidity in the future.

- A description of the process and the data used to design the well.
- The equipment and procedure used to install the well.
- The well development procedure.
- Pertinent lithologic or hydrogeologic information.

If from review of the submitted data the Department determines that both the elevated Dissolved Oxygen and Turbidity measurements are due to naturally occurring conditions, then only the first four (4) items are required to be submitted in future reports. However, if the Department cannot determine if the Dissolved Oxygen or Turbidity is elevated due to naturally occurring conditions, then in addition to the first four (4) items, a description of the conditions at the site that may have caused the affected parameter(s) to be high is required to be submitted in future reports.

3.3. If the stabilization parameters in either section 3.1 or 3.2 cannot be met, and all attempts have been made to minimize the drawdown, check the instrument condition and calibration, purging flow rate and all tubing connections to determine if they might be affecting the ability to achieve stable measurements. All measurements that were made during the attempt must be documented. The sampling team leader may decide whether or not to collect a sample or to continue purging after five (5) well volumes (conventional purge section 2.1 or 2.3 above) or five (5) volumes of the screened interval (minimizing purge volumes in section 2.2 above).

Further, the report in which the data are submitted must include the following, as applicable, except that the last four (4) items only need to be submitted once:

- Purging rate.
- Pump or tubing intake placement.
- Length and location of the screened interval.
- Drawdown in the well, if any.
- A description of conditions at the site that may cause the Dissolved Oxygen to be high and/or Dissolved Oxygen measurements made within the screened or open hole portion of the well with a downhole dissolved oxygen probe.
- A description of conditions at the site that may cause the turbidity to be high and any procedures that will be used to minimize turbidity in the future.
- A description of the process and the data used to design the well.
- The equipment and procedure used to install the well.
- The well development procedure.
- Pertinent lithologic or hydrogeologic information.

If from review of the submitted data the FDEP determines that both the elevated Dissolved Oxygen and Turbidity measurements are due to naturally occurring conditions, then only the first four (4) items are required to be submitted in future reports. However, if the FDEP cannot determine if the Dissolved Oxygen or Turbidity is elevated due to naturally occurring conditions, then in addition to the first four (4) items, a description of the conditions at the site that may have caused the affected parameter(s) to be high is required to be submitted in future reports.

3.4. One fully dry purge (not recommended). This criterion applies only if purging was attempted per FS 2212, FS 2213, and section 3.4.1 below, and if it is impossible to balance the pumping rate with the rate of recharge at very low pumping rates (< 100 mL/minute).

3.4.1. If wells have previously and consistently purged dry, when purged according to FS 2212 and FS 2213, and the current depth to groundwater indicates that the well will purge dry during the current sampling event, minimize the amount of water removed from the well by using the same pump to purge and collect the sample:

3.4.1.1 Place the pump or tubing intake within the well screened interval.

3.4.1.2 Use very small diameter Teflon, Polyethylene or PP tubing and the smallest possible pump chamber volume to minimize the total volume of water pumped from the well and to reduce drawdown.

3.4.1.3 Select tubing that is thick enough to minimize oxygen transfer through the tubing walls while pumping.

3.4.1.4 Pump at the lowest possible rate (100 mL/minute or less) to reduce drawdown to a minimum.

3.4.1.5 Purge at least two (2) volumes of the pumping system (pump, tubing and flow cell, if used).

3.4.1.6 Measure pH, Specific Conductance, Temperature, Dissolved Oxygen and Turbidity and begin to collect the samples (see FS 2222).

4. Collect samples immediately after purging is complete. The time period between completing the purge and sampling cannot exceed six (6) hours. If sample collection does not occur within one (1) hour of purging completion, re-measure the five (5) field parameters Temperature, pH, Specific Conductance, Dissolved Oxygen and Turbidity just prior to collecting the sample. If the measured values are not within 10 percent of the previous measurements, re-purge the well. The exception is "dry" wells (see section 3.4 above).

5. LANYARDS

1.2. Securely fasten lanyards, if used, to any downhole equipment (bailers, pumps, etc.).

1.3. See FS 2201, section 4, for acceptable lanyard types and use.

1.4. Use bailer lanyards in such a way that they do not touch the ground surface.

FS 2213. Purging Wells Without Plumbing (Monitoring Wells)

1. TUBING/PUMP PLACEMENT

1.1. Do not lower the pump or tubing to the bottom of the well. Pump or tubing placement will be determined by the purging option selected in FS 2212, section 2 above.Minimizing Purge Volume: If the following conditions can be met, position the intake hose or pump at the midpoint of the screened or open hole interval.

- The same pump must be used for both purging and sampling,
- The well screen interval must be less than or equal to 10 feet, and
- The well screen must be fully submerged.

1.2. Conventional Purging: Position the pump or intake tubing in the top one foot of the water column or no deeper than necessary for the type of pump. If purging with a bailer, see section 4 below.

1.3. Partially Submerged Screened Interval: If the well screen or borehole is partially submerged, and the pump will be used for both purging and sampling, position the pump midway between the measured water level and the bottom of the screen. Otherwise position the pump as described in section 1.2 above. If purging with a bailer, see section 4 below.

2. NON-DEDICATED (PORTABLE) PUMPS

2.1. Variable Speed Peristaltic Pump

2.1.1. Attach a short section of tubing to the discharge side of the pump and into a graduated container.

2.1.2. Attach one end of a length of new or precleaned tubing to the pump head flexible hose.

2.1.3. Place the tubing per one of the options in FS 2213, section 1 above.

2.1.4. Measure the depth to groundwater at frequent intervals.

2.1.5. Record these measurements.

2.1.6. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

2.1.7. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdrawal rate with the recharge rate.

2.1.8. If the water table continues to drop during pumping, lower the tubing at the approximate rate of drawdown so that the water is removed from the top of the water column.

2.1.9. Record the purging rate each time the rate changes.

2.1.10. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

2.1.11. Record this measurement.

2.1.12. Decontaminate the pump and tubing between wells (see FC 1000) or only the pump if precleaned tubing is used for each well.

2.2. Variable Speed Centrifugal Pump

2.2.1. Position fuel powered equipment **downwind** and at least 10 feet from the well head. Make sure that the exhaust faces downwind.

2.2.2. Place the decontaminated suction hose so that water is always pumped from the top of the water column.

2.2.3. Equip the suction hose with a foot valve to prevent purge water from re-entering the well.

2.2.4. Measure the depth to groundwater at frequent intervals.

2.2.5. Record these measurements.

2.2.6. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

2.2.7. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdrawal rate with the recharge rate.

2.2.8. If the water table continues to drop during pumping, lower the tubing at the approximate rate of drawdown so that the water is removed from the top of the water column.

2.2.9. Record the purging rate each time the rate changes.

2.2.10. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

2.2.11. Record this measurement.

2.2.12. Decontaminate the pump and tubing between wells (see FC 1000) or only the pump if precleaned tubing is used for each well.

2.3. Variable Speed Electric Submersible Pump

2.3.1. Position fuel powered equipment **downwind** and at least 10 feet from the well head. Make sure that the exhaust faces downwind.

2.3.2. Carefully position the decontaminated pump per one of the options in FS 2213, section 1 above.

2.3.3. Measure the depth to groundwater at frequent intervals.

2.3.4. Record these measurements.

2.3.5. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

2.3.6. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdrawal rate with the recharge rate.

2.3.7. If the water table continues to drop during pumping, lower the tubing or pump at the approximate rate of drawdown so that the water is removed from the top of the water column.

2.3.8. Record the purging rate each time the rate changes.

2.3.9. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

2.3.10. Record this measurement.

2.3.11. Decontaminate the pump and tubing between wells (see FC 1000) or only the pump if precleaned tubing is used for each well.

2.4. Variable Speed Bladder Pump

2.4.1. Position fuel powered equipment **downwind** and at least 10 feet from the well head. Make sure that the exhaust faces downwind.

2.4.2. Attach the tubing and carefully position the pump per one of the options in FS 2213, section 1 above.

2.4.3. Measure the depth to groundwater at frequent intervals.

2.4.4. Record these measurements.

2.4.5. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

2.4.6. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdrawal rate with the recharge rate.

2.4.7. If the water table continues to drop during pumping, lower the tubing or pump at the approximate rate of drawdown so that the water is removed from the top of the water column.

2.4.8. Record the purging rate each time the rate changes.

2.4.9. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

2.4.10. Record this measurement.

2.4.11. Decontaminate the pump and tubing between wells (see FC 1000) or only the pump if precleaned tubing is used for each well.

3. DEDICATED PORTABLE PUMPS: Place dedicated pumps per one of the options in FS 2213, section 1 above.

3.1. Variable Speed Electric Submersible Pump

3.1.1. Position fuel powered equipment **downwind** and at least 10 feet from the well head. Make sure that the exhaust faces downwind.

3.1.2. Measure the depth to groundwater at frequent intervals.

3.1.3. Record these measurements.

3.1.4. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

3.1.5. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdraw with the recharge rate.

3.1.6. Record the purging rate each time the rate changes.

3.1.7. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

3.1.8. Record this measurement.

3.2. Variable Speed Bladder Pump

3.2.1. Position fuel powered equipment **downwind** and at least 10 feet from the well head. Make sure that the exhaust faces downwind.

3.2.2. Measure the depth to groundwater at frequent intervals.

3.2.3. Record these measurements.

3.2.4. Adjust the purging rate so that it is equivalent to the well recovery rate to minimize drawdown.

3.2.5. If the purging rate exceeds the well recovery rate, reduce the pumping rate to balance the withdraw with the recharge rate.

3.2.6. Record the purging rate each time the rate changes.

3.2.7. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

3.2.8. Record this measurement.

4. BAILERS: FDEP recommends against using bailers for purging except as a last contingency, or if free product is present in the well or suspected to be in the well. However, they may be used if approved by an FDEP program, or specified in a permit, contract or FDEP order (see Table FS 2200-3 and FS 2211, section 1.3). If in doubt about the appropriateness of using a

bailer at a site or during a particular sampling event, contact the appropriate FDEP program or project manager.

4.1. Minimize handling the bailer as much as possible.

4.1.1. Remove the bailer from its protective wrapping just before use.

4.1.2. Attach a lanyard of appropriate material (see FS 2201, section 4).

4.1.3. Use the lanyard to move and position the bailer.

4.2. Lower and retrieve the bailer slowly and smoothly.

4.2.1. Lower the bailer carefully into the well to a depth approximately a foot above the water column.

4.2.1.1. When the bailer is in position, lower the bailer into the water column at a rate of 2 cm/sec until the desired depth is reached (see section 4.2.2 below).

4.2.2. Do not lower the top of the bailer more than one (1) foot below the top of the water table so that water is removed from the top of the water column. Ensure that the length of the bailer does not exceed the length of the water column.

4.2.3. Allow time for the bailer to fill with aquifer water as it descends into the water column.

4.2.3.1. Carefully raise the bailer. Retrieve the bailer at the same rate of 2 cm/sec until the bottom of the bailer has cleared to top of the water column.

4.3. Measure the purge volume by one of the methods outlined in FS 2212, section 1.

4.3.1. Record the volume of the bailer.

4.4. Continue to carefully lower and retrieve the bailer as described above until the purging completion conditions specified in FS 2212, section 3, have been satisfied.

4.4.1. Remove at least one (1) well volume before collecting measurements of the field parameters. Take each subsequent set of measurements after removing at least one quarter (1/4) well volume between measurements.

FS 2214. Purging Wells With Plumbing (production wells or permanently installed pumps equipped with sampling ports or sampling spigots)

Wells with in-place plumbing are commonly found at municipal water treatment plants, industrial water supplies, private residences, etc.

1. CONTINUOUSLY RUNNING PUMPS

1.1. Select the spigot that is closest to the pump and before any storage tanks (if possible).

1.2. Remove all hoses, aerators and filters (if possible).

1.3. Open the spigot and purge at maximum flow.

1.4. If a storage tank is located between the pump and the spigot, purge the volume of the tank, lines and spigot.

1.5. If the spigot is before any storage tank, purge until sufficient volume is removed to flush the stagnant water from the spigot and the tap line to the spigot.

1.6. Reduce the flow rate to ≤ 500 mL/minute (a 1/8" stream) or approximately 0.1 gal/minute before collecting samples. When sampling for volatile organic compounds, reduce the flow to ≤100 mL/minute before collecting the samples.

2. INTERMITTENTLY RUNNING PUMPS

2.1. Open the spigot and purge sufficient volume to flush the spigot and lines and until the purging completion criteria in FS 2212, section 3, have been met.

2.2. Reduce the flow rate to ≤500 mL/minute (a 1/8" stream) or approximately 0.1 gal/minute before collecting samples. When sampling for volatile organic compounds, reduce the flow to ≤ 100 mL/minute before collecting the samples.

FS 2215. Purging Airstrippers and Remedial Treatment Systems

If collecting samples for groundwater contamination monitoring, follow FS 2214 above.

FS 2220. GROUNDWATER SAMPLING TECHNIQUES

1. Purge wells using the techniques outlined in FS 2210.

2. Replace the protective covering around the well if it is soiled or torn after completing the purging operations.

3. EQUIPMENT CONSIDERATIONS

3.1. Some pumps may be used for sampling groundwater. Follow all notes and restrictions as defined in Table FS 2200-1 and discussed in Equipment and Supplies (FS 2201) when using pumps and other equipment to collect samples.

NOTE: The only pumps that are currently approved for use in collecting volatile organic samples through the pump are stainless steel and Teflon variable speed submersible pumps, stainless steel and Teflon or Polyethylene variable speed bladder pumps, and permanently installed PVC bodied pumps as long as the pump remains in contact with the water in the well at all times.

3.2. Collect the sample into the sample container from the sampling device. **Do not** use intermediate containers.

3.3. In order to avoid contaminating the sample or loss of analytes from the sample:

3.3.1. Handle the sampling equipment as little as possible.

3.3.2. Minimize the equipment that is exposed to the sample.

3.3.3. Minimize aeration of samples collected for VOC analysis.

3.3.2.1. Reduce flow rates to ≤ 100 mL/minute when collecting VOC samples.

3.4. Dedicated Sampling Equipment

3.4.1. Whenever possible, use dedicated equipment because it significantly reduces the chance of cross-contamination.

3.4.2. Dedicated is defined as equipment that is to be used solely for one location for the life of that equipment (e.g., permanently mounted pump).

3.4.3. All material construction and restrictions from Table FS 2200-1 also apply to dedicated equipment. Purchase equipment with the most sensitive analyte of interest in mind.

3.4.4. Cleaning/Decontamination

3.4.4.1 Clean or make sure dedicated pumps are clean before installation. They do not need to be cleaned prior to each use but must be cleaned if they are withdrawn for repair or servicing.

3.4.4.2 Clean or make sure any permanently mounted tubing is clean before installation.

3.4.4.3 Change or clean tubing when the pump is withdrawn for servicing.

3.4.4.4 Clean any replaceable or temporary parts as specified in FC 1000.

3.4.4.5 Collect equipment blanks on dedicated pumping systems when the tubing is cleaned or replaced.

3.4.4.6 Clean or make sure dedicated bailers are clean before placing them into the well.

3.4.4.7 Collect an equipment blank on dedicated bailers before introducing them into the water column.

3.4.4.8 Suspend dedicated bailers above the water column if they are stored in the well.

FS 2221. Sampling Wells Without Plumbing

1. SAMPLING WITH PUMPS: Variable speed stainless steel and Teflon submersible pumps and stainless steel, Teflon or Polyethylene bladder pumps, and permanently installed PVC-bodied pumps, as long as the pump remains in contact with the water in the well at all times, may be used to sample for all organics. The delivery tubing must be Teflon, Polyethylene or PP. **Extractable organics** may be collected through a peristaltic pump if flexible tubing made of approved materials is used in the pump head or a vacuum trap is used (see Figure FS 2200-1 for specific configuration). Follow all notes and restrictions as defined in Table FS 2200-1 and discussed in Equipment and Supplies (FS 2201) when using pumps to collect samples.

Do not lower the pump or tubing to the bottom of the well.

1.1. Peristaltic Pump

1.1.1. Volatile Organics: Collect volatile organics last. If the pump tubing is placed within the screened interval, the tubing cannot be reinserted into the well, and steps 1.1.1.7, 1.1.1.13 and 1.1.1.17 below are prohibited.

1.1.1.1. Ensure that there is sufficient tubing volume to fill the requisite number of VOC vials.

1.1.1.2. Remove the drop tubing from the inlet side of the pump.

1.1.1.3. Submerse the drop tubing into the water column.

1.1.1.4. Prevent the water in the tubing from flowing back into the well.

1.1.1.5. Remove the drop tubing from the well.

1.1.1.6. Carefully allow the groundwater to gravity drain into the sample vials. Avoid turbulence. Do not aerate the sample. The flow rate must be $\leq$ 100 mL/minute.

1.1.1.7. Repeat steps 1.1.1.2 through 1.1.1.5 until enough vials are filled.

1.1.1.8. Alternatively, use the pump to fill the drop tubing.

1.1.1.9. Quickly remove the tubing from the pump.

1.1.1.10. Prevent the water in the tubing from flowing back into the well.

1.1.1.11. Remove the drop tubing from the well.

1.1.1.12. Carefully allow the groundwater to drain into the sample vials. Avoid turbulence. Do not aerate the sample. The flow rate must be ≤ 100 mL/minute.

1.1.1.13. Repeat steps 1.1.1.8 through 1.1.1.12 until enough vials are filled.

1.1.1.14. Or, use the pump to fill the drop tubing

1.1.1.15. Withdraw the tubing from the well.

1.1.1.16. Reverse the flow on the peristaltic pump to deliver the sample into the vials at a slow, steady rate. The flow rate must be ≤ 100 mL/minute.

1.1.1.17. Repeat steps 1.1.1.14 through 1.1.1.16 until enough vials are filled.

1.1.2. Extractable Organics

1.1.2.1. Assemble the components of the pump and trap according to Figure FS 2200-1.

1.1.2.2. The sample container should be the trap bottle.

1.1.2.3. All equipment that contacts the groundwater **before** the sample container must be constructed of Teflon, Polyethylene, PP, stainless steel or glass, including the transport tubing to and from the sample container, the interior liner of the container cap and all fittings. **Do not use a rubber stopper as a cap.**

1.1.2.4. Connect the outflow tubing from the container to the influent side of the peristaltic pump.

1.1.2.5. Turn the pump on and reduce the flow rate to a smooth and even flow.

1.1.2.6. Discard a small portion of the sample to allow an air space.

1.1.2.7. Preserve (if required), label and complete the field notes.

1.1.3. Inorganics

1.1.3.1. Inorganic samples may be collected from the effluent tubing.

1.1.3.2. If samples are collected from the pump, decontaminate all tubing (including the tubing in the head) or change it between wells.

1.1.3.3. Preserve (if required), label and complete field notes.

1.2. Variable Speed Bladder Pump

1.2.1. If sampling for organics the pump body must be constructed of stainless steel and the valves and bladder must be Teflon. All tubing must be Teflon, Polyethylene, or PP and any cabling must be sealed in Teflon, Polyethylene or PP, or made of stainless steel.

1.2.2. After purging to a smooth even flow, reduce the flow rate.

1.2.3. When sampling for volatile organic compounds, reduce the flow rate to 100 mL/minute or less, if possible.

1.3. Variable Speed Submersible Pump

1.3.1. The housing must be stainless steel.

1.3.2. If sampling for organics, the internal impellers, seals and gaskets must be constructed of stainless steel, Teflon, Polyethylene or PP. The delivery tubing must be Teflon, Polyethylene or PP and the electrical cord must be sealed in Teflon and any cabling must be sealed in Teflon or constructed of stainless steel.

1.3.3. After purging to a smooth even flow, reduce the flow rate.

1.3.4. When sampling for volatile organic compounds, reduce the flow rate to 100 mL/minute or less, if possible.

2. SAMPLING WITH BAILERS: A high degree of skill and coordination are necessary to collect representative samples with a bailer. When properly used, bailers may be used to collect samples for certain analyte groups and under specific conditions (see Table FS 2200-3). They must be of an appropriate type and construction (see FS 2201, section 3), and must be used as outlined below. If in doubt about the appropriateness of using a bailer at a site or during a particular sampling event, contact the appropriate FDEP program or project manager.

2.1. General Considerations

2.1.1. Minimize handling the bailer as much as possible.

2.1.1.1. Wear sampling gloves.

2.1.1.2. Remove the bailer from its protective wrapping just before use.

2.1.1.3. Attach a lanyard of appropriate material (see FS 2201, section 4).

2.1.1.4. Use the lanyard to move and position the bailers.

2.1.2. Do not allow the bailer or lanyard to touch the ground.

2.1.3. Rinsing

2.1.3.1. If the bailer is certified precleaned, no rinsing is necessary.

2.1.3.2. If both a pump and a bailer are to be used to collect samples, rinse the exterior and interior of the bailer with sample water from the pump before removing the pump.

2.1.3.3. If the purge pump is not appropriate for collecting samples (e.g., non-inert components), rinse the bailer with by collecting a single bailer of the groundwater to be sampled. Use the technique described in section 2.2, Bailing Technique, below.

2.1.3.4. Discard the water appropriately.

2.1.3.5. **Do not** rinse the bailer if Oil & Grease, TRPHs, etc., (see FS 2006) are to be collected.

2.2. Bailing Technique

2.2.1. Collect all samples that are required to be collected with a pump before collecting samples with the bailer.

2.2.2. Raise and lower the bailer gently to minimize stirring up particulate matter in the well and the water column which can increase sample turbidity.

2.2.3. Lower the bailer carefully into the well to a depth approximately a foot above the water column. Ensure that the length of the bailer does not exceed the length of the water column.

2.2.3.1. When the bailer is in position, lower the bailer into the water column at a rate of 2 cm/sec until the desired depth is reached (see section 2.2.3 above).

2.2.4. Do not lower the top of the bailer more than one (1) foot below the top of the water table so that water is removed from the top of the water column.

2.2.5. Allow time for the bailer to fill with aquifer water as it descends into the water column.

2.2.6. Do not allow the bailer to touch the bottom of the well or particulate matter will be incorporated into the sample.

2.2.6.1. Carefully raise the bailer (see section 2.2.2 above). Retrieve the bailer at the same rate of 2 cm/sec until the bottom of the bailer has cleared to top of the water column.

2.2.7. Lower the bailer to approximately the same depth each time.

2.2.8. Collect the sample.

2.2.8.1. Install a device to control the flow from the bottom of the bailer and discard the first few inches of water. Reduce the flow to $\leq$ 100 mL/minute when collecting VOC samples.

2.2.8.2. Fill the appropriate sample containers by allowing the sample to slowly flow down the side of the container. Minimize aeration of VOC samples.

2.2.8.3. Discard the last few inches of water in the bailer.

2.2.9. Repeat steps 2.2.1 through 2.2.8.3 for additional samples.

2.2.10. As a final step measure the DO, pH, temperature, turbidity and specific conductance after the final sample has been collected.

2.2.10.1. Record all measurements and note the time that sampling was completed.

3. SAMPLING WELLS WITH FLOATING NON-AQUEOUS PHASE LIQUID: FDEP does not recommend the sampling of wells with floating non-aqueous phase liquid for trace contaminants. This concerns primarily petroleum related sites, but includes any chemical product (e.g., solvent) that floats on the water table. Sampling is acceptable if the information is to be used for the purpose of remedial design.

Sample data from such wells cannot provide useful information regarding the level of contamination. Furthermore, FDEP believes that these wells may never provide legitimate data as they may have become (permanently) chemically damaged by the product being in contact with the well casing for an extended period of time.

FDEP does reserve the right to require sampling of these wells, not for levels of trace contaminants, but for confirmation of an appropriate remediation technique. This type of sampling is performed **below** the non-aqueous phase layer (see section 3.2 below).

3.1. Non-Aqueous Phase Liquid Sampling: Non-aqueous phase liquid may be evident in a cased monitoring well or in an open excavation.

3.1.1. Non-aqueous phase liquid is normally sampled for two reasons:

- Documentation for its existence and thickness; and
- Determination of the type of product so that the proper analyses can be performed to determine extent. This is only feasible for relatively recent releases as it may not be possible to identify weathered product.

3.1.2. Disposable plastic (acrylic, clear PVC) bailers are recommended for sampling. Disposable Polyethylene and PP bailers are also acceptable. Other wide mouth vessels may be used for sampling non-aqueous phase liquid in an excavation.

3.1.3. Monitoring Well

3.1.3.1. If a non-aqueous phase liquid is identified in a monitoring well during the water level measurement, measure its thickness in the well. If the thickness of the non-aqueous phase liquid is greater than 0.01 foot or product globules are present, collect a sample using a precleaned disposable bailer.

3.1.3.2. Measure the product thickness to the nearest 0.01 foot after withdrawing the bailer.

3.1.3.3. Pour a portion of the product into a glass sample container.

3.1.3.4. This sample is considered a concentrated waste. Therefore, package the container in protective wrapping to prevent breakage, isolate from other samples, and ice to 4°C.

3.1.4. Excavation

3.1.4.1. If non-aqueous phase liquid is observed in an open excavation, a glass sample container or a precleaned intermediate vessel may be used to collect the sample.

3.1.4.2. Securely tie a lanyard to the container and lower it into the excavation.

3.1.4.3. Gently lower and retrieve the container so that no solid material is released or collected.

3.1.4.4. If sufficient water is available, a bailer can be used.

3.1.4.5. Although not recommended, screened casing can be placed (or augered and placed) in the bottom of the excavation and the product sampled with a bailer.

3.1.4.6. Avoid dangerous situations, such as standing too close to the edge of an excavation, riding in the backhoe bucket, or entering a trench or excavation that may collapse.

3.1.4.7. Follow all applicable OSHA regulations.

3.1.5. Equipment that is dedicated to sampling non-aqueous phase liquid does not need to be cleaned according to the standard, full decontamination protocols. Acrylic or PVC bailers that are never used for trace contaminant sampling may be cleaned as listed below. It is recommended that all cleaning be done in the lab, office or base of operations and not in the field.

3.1.5.1. Disassemble bailers and intermediate vessels and soak in hot, sudsy tap water using a brush to clean away all particulates and greasy films.

3.1.5.2. Rinse with hot tap water.

3.1.5.3. Thoroughly rinse with analyte free water.

3.1.5.4. An optional acid rinse may be used to strip the equipment of any hard to clean residues.

3.1.5.5. The solvent rinse is not mandatory since this equipment is not used for contaminant sampling, other than the product itself. It is not recommended on clear acrylic.

3.2. Sampling Below Product

3.2.1. This type of depth-specific sampling to attempt to sample the dissolved constituents in the water column below the product layer is performed only at the request of FDEP or its designee.

3.2.2. These data provide information that helps define adequate groundwater treatment. Without these data, incorrect (and sometimes unnecessarily expensive) remediation techniques may be designed for a situation where they are not required.

3.2.3. There are some substantial logistical problems involved with sending a sampler through non-aqueous phase liquid to sample the groundwater below. Although there are some products designed specifically for this type of sampling, they are expensive and the results may not be commensurate with their cost. The use of "self-engineered" equipment or coverings may be the best option.

3.2.4. These data are only to be used for qualitative use and will aid in deciding on an appropriate remediation technique.

3.2.5. Wrapping bailers and tubing in plastic seems to be the most popular technique in getting past the product layer.

3.2.6. Although not recommended, some have wrapped submersible pumps in several layers of plastic and retrieved each layer by a separate lanyard. One suggestion would be to use a rigid piece of stainless steel tubing wrapped in plastic.

3.2.6.1. Once the covered tubing is past the layer, pull up on the plastic, piercing the plastic and exposing the (somewhat) clean tubing inlet.

3.2.6.2. Introduce the wrapped hose slowly to not entrain any more product into the dissolved layer located below.

3.2.6.3. Also, perform this procedure with a peristaltic pump or a vacuum pump linked to a trap bottle. To use this setup, the water table must be no deeper than 15-20 feet, realizing that actual sampling may be occurring several feet below the product layer.

FS 2222. Sampling Low Permeability Aquifers or Wells that have Purged Dry

1. Collect the sample(s) after the well has been purged according to FS 2212, section 3.4. Minimize the amount of water removed from the well by using the same pump to purge and collect the sample. If the well has purged dry, collect samples as soon as sufficient sample water is available.

2. Measure the five (5) field parameters Temperature, pH, Specific Conductance, Dissolved Oxygen and Turbidity at the time of sample collection.

3. Advise the analytical laboratory and the client that the usual amount of sample for analysis may not be available.

FS 2223. Sampling Wells With In-Place Plumbing

1. If a storage tank is present, locate a cold water spigot, valve or other sampling point close to the well head between the pump and the storage tank. If there is no sampling location between the pump and the storage tank, locate the spigot, valve or other sampling point closest to the tank.

2. Remove all screens or aerators and reduce the flow rate to no more than 500 mL/minute. If collecting samples for volatile organic compounds, reduce the flow rate to 100 mL/minute or less. Collect the samples directly into the appropriate containers.

FS 2224. Sampling Airstripper and Remedial Treatment System Sampling

Reduce the flow rate to less than 500 mL/minute and begin sample collection. If collecting samples for volatile organic compounds, reduce the flow rate to 100 mL/minute or less. Collect the samples directly into the appropriate containers.

FS 2225. Filtering Groundwater Samples

1. FILTERING GROUNDWATER FOR METALS: Filtered groundwater samples can only be collected after approval from the FDEP program or project manager. If filtering is approved, the FDEP program or permit may require both filtered and unfiltered samples to be collected and reported. Unless specified by the program, use a 1 micrometer (µm) filter.

1.1. Use a disposable, high capacity, 1 µm in-line filter.

1.1.1. Flush the filter with 30-50 mL of analyte free water or an inert gas (nitrogen) to remove atmospheric oxygen;

or

1.1.2. Insert the filter on the high pressure side (i.e., on the delivery side) of the pump. Hold the filter upright with the inlet and outlet vertical. Pump water from the aquifer through the filter until all atmospheric oxygen has been removed.

1.2. Use a variable speed pump that can be fitted with an in-line filter on the outlet end. Peristaltic pumps, bladder pumps or submersible pumps can be used when water levels are no greater than 20 to 25 feet deep; bladder pumps or submersible pumps must be used when water levels are greater than 20 to 25 feet deep.

1.2.1. Install new or precleaned silastic tubing in the variable speed peristaltic pump head at each monitoring well.

1.2.2. Use new or precleaned delivery tubing at each monitoring well.

1.3. Collect filtered samples by either of the methods outlined below if the static water level in the well is too deep for a variable speed peristaltic pump and a variable speed electric submersible pump or variable speed bladder pump of appropriate configuration is not available. Do not agitate the sample or expose it to atmospheric oxygen. **Do not** pour the sample into any intermediate vessel for subsequent filtration.

1.3.1. Collect the sample in a Polyethylene, Teflon or PP bailer that can be pressurized. When the bailer has been retrieved, immediately connect the filter and begin to pressurize the bailer;

or

1.3.2. Collect the sample with a bailer and immediately place the intake tube of the peristaltic pump into the full bailer and begin pumping the water through the filter as described in section 1.2 above.

1.4. **Do not** use the following equipment for filtering groundwater samples for metals:

1.4.1. Any pump and apparatus combination in which the filter is on the vacuum (suction) side of the pump.

1.4.2. Any type of syringe or barrel filtration apparatus.

1.4.3. Any filter that is not encased in a one-piece, molded unit.

FS 2220. REFERENCES

1. American Public Health Association, American Water Works Association, and Water Pollution Control Federation, Standard Methods for the Examination of Water and Wastewater, Page 4-101, 18th Edition, 1992.

2. Florida Department of Environmental Protection, DEP Standard Operating Procedures for Laboratory Operations and Sample Collection Activities, DEP QA-001/92, September 1992.

3. U.S. Environmental Protection Agency, Region 4, Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, May 1996.

Appendix FS 2200
Tables, Figures and Forms

Table FS 2200-1
Equipment for Collecting Groundwater Samples

Activity	Equipment Type
Well Purging	Variable speed centrifugal pump Variable speed submersible pump Variable speed bladder pump Variable speed peristaltic pump Bailer with lanyard: **Not Recommended**
Well Stabilization	pH meter DO meter Conductivity meter Thermometer/Thermistor Turbidimeter Flow-through cell Multi-function meters
Sample Collection	Variable speed peristaltic pump Variable speed submersible pump Variable speed bladder pump Bailer with lanyard (See Table FS 2200-3)
Filtration	Variable speed peristaltic pump Variable speed submersible pump Variable speed bladder pump Pressurized bailer 1.0 µm high capacity molded filter
Groundwater Level	Electronic sensor Chalked tape

Table FS 2200-2
Dissolved Oxygen Saturation

TEMP	D.O.	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L	TEMP	D.O.	mg/L
deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%	deg C	SAT.	20%
15.0	10.084	2.017	19.0	9.276	1.855	23.0	8.578	1.716	27.0	7.968	1.594
15.1	10.062	2.012	19.1	9.258	1.852	23.1	8.562	1.712	27.1	7.954	1.591
15.2	10.040	2.008	19.2	9.239	1.848	23.2	8.546	1.709	27.2	7.940	1.588
15.3	10.019	2.004	19.3	9.220	1.844	23.3	8.530	1.706	27.3	7.926	1.585
15.4	9.997	1.999	19.4	9.202	1.840	23.4	8.514	1.703	27.4	7.912	1.582
15.5	9.976	1.995	19.5	9.184	1.837	23.5	8.498	1.700	27.5	7.898	1.580
15.6	9.955	1.991	19.6	9.165	1.833	23.6	8.482	1.696	27.6	7.884	1.577
15.7	9.934	1.987	19.7	9.147	1.829	23.7	8.466	1.693	27.7	7.870	1.574
15.8	9.912	1.982	19.8	9.129	1.826	23.8	8.450	1.690	27.8	7.856	1.571
15.9	9.891	1.978	19.9	9.111	1.822	23.9	8.434	1.687	27.9	7.842	1.568
16.0	9.870	1.974	20.0	9.092	1.818	24.0	8.418	1.684	28.0	7.828	1.566
16.1	9.849	1.970	20.1	9.074	1.815	24.1	8.403	1.681	28.1	7.814	1.563
16.2	9.829	1.966	20.2	9.056	1.811	24.2	8.387	1.677	28.2	7.800	1.560
16.3	9.808	1.962	20.3	9.039	1.808	24.3	8.371	1.674	28.3	7.786	1.557
16.4	9.787	1.957	20.4	9.021	1.804	24.4	8.356	1.671	28.4	7.773	1.555
16.5	9.767	1.953	20.5	9.003	1.801	24.5	8.340	1.668	28.5	7.759	1.552
16.6	9.746	1.949	20.6	8.985	1.797	24.6	8.325	1.665	28.6	7.745	1.549
16.7	9.726	1.945	20.7	8.968	1.794	24.7	8.309	1.662	28.7	7.732	1.546
16.8	9.705	1.941	20.8	8.950	1.790	24.8	8.294	1.659	28.8	7.718	1.544
16.9	9.685	1.937	20.9	8.932	1.786	24.9	8.279	1.656	28.9	7.705	1.541
17.0	9.665	1.933	21.0	8.915	1.783	25.0	8.263	1.653	29.0	7.691	1.538
17.1	9.645	1.929	21.1	8.898	1.780	25.1	8.248	1.650	29.1	7.678	1.536
17.2	9.625	1.925	21.2	8.880	1.776	25.2	8.233	1.647	29.2	7.664	1.533
17.3	9.605	1.921	21.3	8.863	1.773	25.3	8.218	1.644	29.3	7.651	1.530
17.4	9.585	1.917	21.4	8.846	1.769	25.4	8.203	1.641	29.4	7.638	1.528
17.5	9.565	1.913	21.5	8.829	1.766	25.5	8.188	1.638	29.5	7.625	1.525
17.6	9.545	1.909	21.6	8.812	1.762	25.6	8.173	1.635	29.6	7.611	1.522
17.7	9.526	1.905	21.7	8.794	1.759	25.7	8.158	1.632	29.7	7.598	1.520
17.8	9.506	1.901	21.8	8.777	1.755	25.8	8.143	1.629	29.8	7.585	1.517
17.9	9.486	1.897	21.9	8.761	1.752	25.9	8.128	1.626	29.9	7.572	1.514
18.0	9.467	1.893	22.0	8.744	1.749	26.0	8.114	1.623	30.0	7.559	1.512
18.1	9.448	1.890	22.1	8.727	1.745	26.1	8.099	1.620	30.1	7.546	1.509
18.2	9.428	1.886	22.2	8.710	1.742	26.2	8.084	1.617	30.2	7.533	1.507
18.3	9.409	1.882	22.3	8.693	1.739	26.3	8.070	1.614	30.3	7.520	1.504
18.4	9.390	1.878	22.4	8.677	1.735	26.4	8.055	1.611	30.4	7.507	1.501
18.5	9.371	1.874	22.5	8.660	1.732	26.5	8.040	1.608	30.5	7.494	1.499
18.6	9.352	1.870	22.6	8.644	1.729	26.6	8.026	1.605	30.6	7.481	1.496
18.7	9.333	1.867	22.7	8.627	1.725	26.7	8.012	1.602	30.7	7.468	1.494
18.8	9.314	1.863	22.8	8.611	1.722	26.8	7.997	1.599	30.8	7.456	1.491
18.9	9.295	1.859	22.9	8.595	1.719	26.9	7.983	1.597	30.9	7.443	1.489

Derived using the formula in Standard Methods for the Examination of Water and Wastewater, Page 4-101, 18th Edition, 1992

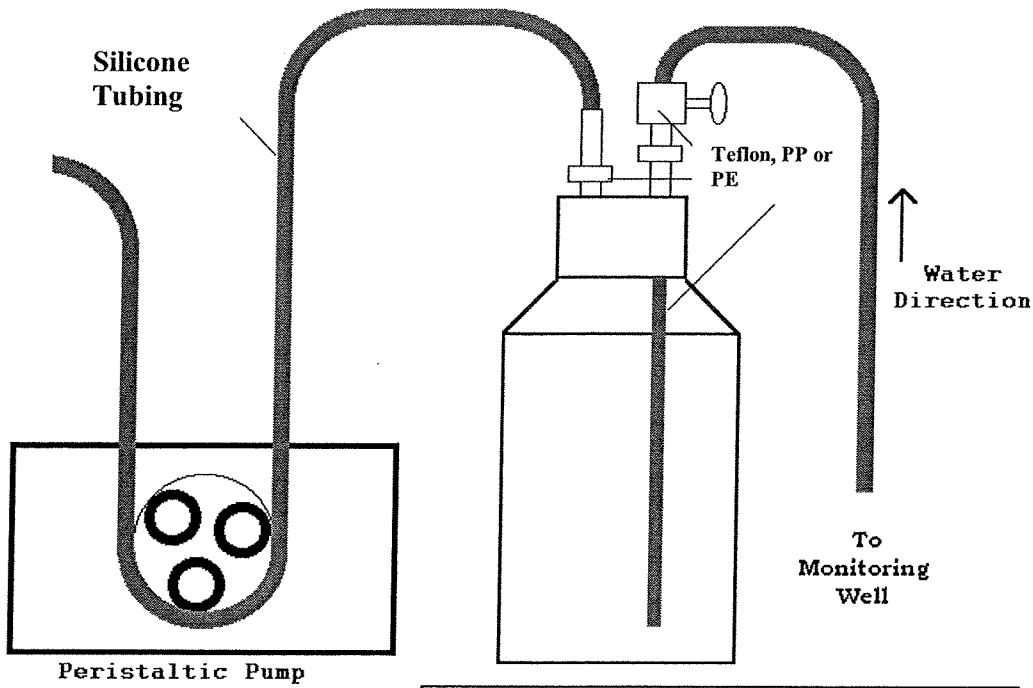
Table FS 2200-3
Allowable Uses for Bailers

ANALYTE GROUP(S)	PURGING (Not Recommended)	SAMPLING	
	Use:	Use:	Not Recommended:
Volatile Organics Extractable Organics Radionuclides, including Radon Metals Volatile Sufides	If allowed by permit, program, contract or order or If operated by a skilled individual with documented training in proper techniques. Field documentation must demonstrate that the procedure in FS 2213, section 4 was followed without deviation.	If concentrations exceed action levels, the purpose is to monitor effective treatment, and the FDEP program allows the use of bailers; or If specified by FDEP permit, program, contract or order. or If operated by a skilled individual with documented training in proper techniques and using appropriate equipment. Field documentation must demonstrate that the procedure in FS 2221, section 2 was followed without deviation.	If concentrations are near or below the stated action levels; or If a critical decision (e.g., clean closure) will be made based on the data; or If data are to demonstrate compliance with a permit or order.
Petroleum Hydrocarbons (TRPH) & Oil & Grease	If allowed by permit, program, contract or order or If operated by a skilled individual with documented training in proper techniques. Field documentation must demonstrate that the procedure in FS 2213, section 4 was followed without deviation.	Only if allowed by permit, program, contract or order as samples should be collected into the container without intermediate devices.	Unless allowed by permit, program, contract or order.

ANALYTE GROUP(S)	**PURGING** (Not Recommended)	**SAMPLING**	
	Use:	Use:	Not Recommended:
Biologicals Inorganic Non-Metallics Aggregate Organics Microbiological Physical and Aggregate Properties	If allowed by permit, program, contract or order or If operated by a skilled individual with documented training in proper techniques. Field documentation must demonstrate that the procedure in FS 2213, section 4 was followed without deviation.	If all analytes collected from the well can be collected with a bailer; or If collected <u>after</u> collecting all analytes that require the use of a pump.	Before collecting any analytes that must be collected with a pump.
Ultra-Trace Metals	Never	Never	

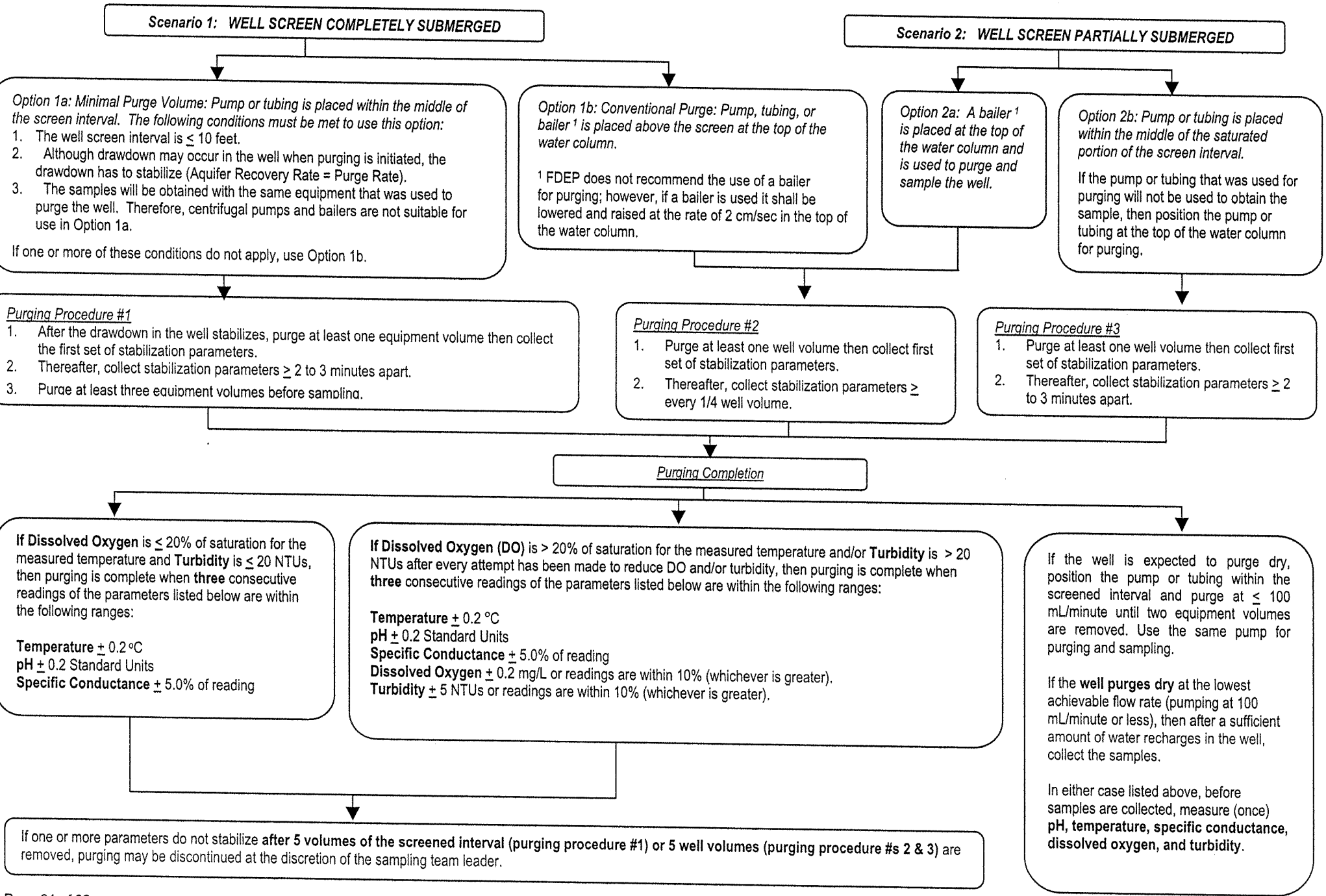
Figure 2200-1

Pump and Trap for Extractable Organics



The glass sample bottle must be threaded to use a reusable sampling cap lined and installed with fittings made of Teflon, polypropylene or polyethylene, similar to the design shown.

Figure FS 2200-2 Groundwater Purging Procedure



DEP-SOP-001/01
FS 2200 Groundwater Sampling
Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	SITE LOCATION:	
WELL NO:	SAMPLE ID:	DATE:

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER:

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
= (feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{o}C)	COND. (µmhos/cm or µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION:	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: Y N	FIELD-FILTERED: Y N FILTER SIZE: ____ µm Filtration Equipment Type:	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)