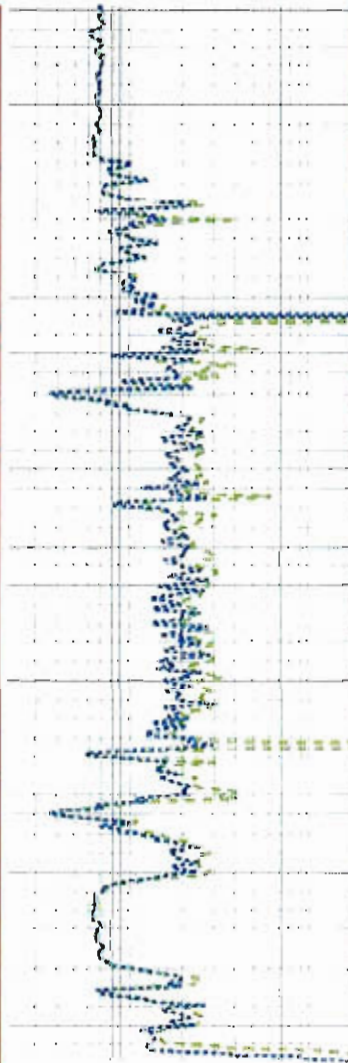
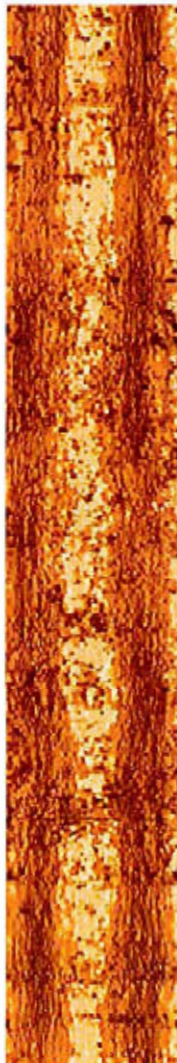


City of Hialeah
Reverse Osmosis Water Treatment Plant
Injection Wells IW-1 & IW-2 and
Dual-Zone Monitor Well DZMW-1
Completion Report
APPENDICES
VOLUME 1

November 12, 2010



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Appendix A



Florida Department of Environmental Protection

Southeast District
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

ELECTRONIC CORRESPONDENCE

July 22, 2009

NOTICE OF PERMIT

Amando Vidal, P.E., Director
City of Hialeah Department of Water and Sewer
501 Palm Avenue
Hialeah, Florida 33010

Miami-Dade
UIC – City of Hialeah RO WTP
FILE: 0289249-001-UC

Dear Mr. Vidal:


Enclosed is Permit Number 0289249-001-UC, to construct and test an injection well system for the City of Hialeah Department of Water and Sewer, consisting of two Class I injection wells (IW-1 and IW-2) and one associated dual zone monitor well (MW-1) issued pursuant to Section(s) 403.087, Florida Statutes and Florida Administrative Codes 62-4, 62-520, 62-522, 62-528, 62-550 and 62-660. The system will be constructed at the City of Hialeah Reverse Osmosis Water Treatment Plant (RO WTP).

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, Mail Stop 35, 3900 Commonwealth Blvd., 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.

Should you have any questions, please contact J. Gardner Strasser, PG, or Joseph R. May, PG, of this office at (561) 681-6688 or (561) 681-6691, respectively.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION


to: Jack Long
District Director
Southeast District

07/22/09
Date

JL/LAB/JRM/JGS

cc: Robert Maliva, MGS
Wilbur Mayorga, M-D DERM
Agustin Socarras, M-D DERM

Terry Finch, Project Manager, Parsons – terry.finch@parsons.com

Ron Armstrong, P.E., Parsons – ron.armstrong@parsons.com

Joe Haberfeld, FDEP/TLH
George Heuler, FDEP/TLH
Steve Anderson, SFWMD/WPB

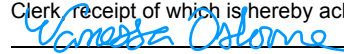
Tim Powell, FDEP/WPB
Nancy Marsh, USEPA/ATL

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on
7/22/09 to the listed persons.

Clerk Stamp

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


Clerk

7/22/09
Date



Florida Department of Environmental Protection

Southeast District
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

PERMITTEE:
Amando Vidal, P.E., Director
City of Hialeah Department of Water and Sewer
501 Palm Avenue
Hialeah, Florida 33010

PERMIT/CERTIFICATION NUMBER: 0289249-001-UC
DATE OF ISSUANCE: July 22, 2009
EXPIRATION DATE: July 21, 2012
COUNTY: Miami-Dade
POSITION: 25° 55' 27" N / 80° 22' 04" W
PROJECT: Class I, two (2) Test Injection Well Construction
Permit and one (1) Dual Zone Monitor Well

PROJECT: Construction and testing permit of two injection wells (IW-1 and IW-2) and an associated dual zone monitor well (MW-1)

This permit is issued under the provisions of Chapter 403.087, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-522, 62-528, 62-550, and 62-660. The above named permittee is hereby authorized to perform the work or construct 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:

TO CONSTRUCT AND OPERATIONALLY TEST: Two Class I injection wells, IW-1 and IW-2, to be constructed using tubing and packer, with an associated deep dual zone monitoring well, DZMW-1. The two injection wells will be constructed with a design that includes tubing, packer, and fluid filled annular space around the tubing. In each well, a 14.48-inch inside diameter (I.D.), 0.66-inch thick fiberglass reinforced plastic (FRP) epoxy resin tubing will be installed within a 24-inch outside diameter (O.D.), 23-inch inside diameter steel injection casing. Preliminary design plans indicate that IW-1 and IW-2 will be cased to approximately 2,950 feet below land surface (bls) and will have a total depth of approximately 3,500 feet bls; final setting depths will be determined based on field conditions after approval from the Department.

The planned maximum (peak hour) flow rate of effluent to each injection well is 7.39 million gallons per day (MGD) or 5,130 gallons per minute (gpm). The rated capacity will be contingent on the results of testing and Department approval.

The dual-zone monitor well (DZMW-1) will be located between and shared by both injection wells. The injection wells (IW-1 and IW-2) and dual-zone monitor well (DZMW-1) will have a collinear arrangement with the dual-zone monitor well located approximately 125 feet from each injection well. The confinement of the injection zone from overlying underground source of drinking water (USDW) aquifers and fluid movement adjacent to the wellbore of the injection well will be monitored by two monitoring zones in DZMW-1. The intention of the dual monitor well system design is to have the upper monitoring zone be the compliance point with regard to matters of the USDW and to have the lower monitoring zone be the compliance point with regard to vertical movement out of the injection zone. The upper interval shall be positioned in a zone with permeability adequate for monitoring (i.e., that can produce adequate water for collection of representative ground water samples), in immediate proximity to the base of the USDW. The lower interval shall be positioned in a zone with permeability adequate for monitoring, below the base of the USDW, to verify the effectiveness of the confining unit and external mechanical integrity of the injection well. Accordingly, this zone shall be placed far enough below the base of the USDW to function as an early warning for fluid movement. Actual setting depths in DZMW-1 will be determined based on field conditions only after approval from the Department.

Amando Vidal, P.E., Director
City of Hialeah Department of Water and Sewer
Class I Test/Injection Wells IW-1 & IW-2
Page 2 of 24

Permit Number: 0289249-001-UC
Date Issued: July 22, 2009
Expiration Date: July 21, 2012

IN ACCORDANCE WITH: Application for a Class I, Test Injection Well Construction and Testing Permit, received May 27, 2008; Request for Information One (RFI-1) dated August 22, 2008; Response to RFI-1 received December 17, 2008; publication of the Notice of Draft Permit 0289249-001-UC in the Miami Herald newspaper on April 16, 2009; and publication of the Intent to Issue Permit 0289249-001-UC in the Miami Herald newspaper on June 24, 2009.

LOCATED AT: The City of Hialeah Reverse Osmosis Water Treatment Plant, along Northwest 166th Street and Northwest 102th Avenue, in Hialeah, Miami-Dade County, Florida.

TO SERVE: The City of Hialeah Reverse Osmosis Water Treatment Plant.

SUBJECT TO: General Conditions 1-24 and **Specific Conditions 1-11**.

GENERAL CONDITIONS:

The following General Conditions are referenced in Florida Administrative Code Rule 62-528.307.

- 1) The terms, conditions, requirements, limitations and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to Section 403.141, F.S.
- 2) This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action.
- 3) As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.
- 4) This permit conveys no title to land, water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
- 5) This permit does not relieve the permittee from liability for harm to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefrom; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
- 6) The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, or are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
- 7) The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:
 - a) Have access to and copy any records that must be kept under conditions of this permit;
 - b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
 - c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time will depend on the nature of the concern being investigated.

- 8) If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
 - a) A description of and cause of noncompliance; and
 - b) The period of noncompliance, including dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent the recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for
 - c) penalties or for revocation of this permit.

- 9) In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.
- 10) The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
- 11) This permit is transferable only upon Department approval in accordance with rules 62-4.120 and 62-528.350, F.A.C. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
- 12) This permit or a copy thereof shall be kept at the work site of the permitted activity.
- 13) The permittee shall comply with the following;
 - a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records shall be extended automatically unless the Department determines that the records are no longer required.
 - b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
 - c) Records of monitoring information shall include:
 - i) the date, exact place, and time of sampling or measurements;
 - ii) the person responsible for performing the sampling or measurements;
 - iii) the dates analyses were performed;
 - iv) the person responsible for performing the analyses;
 - v) the analytical techniques or methods used;
 - vi) the results of such analyses.
 - d) The permittee shall furnish to the Department, within the time requested in writing, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.
 - e) If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.
- 14) All applications, reports, or information required by the Department shall be certified as being true, accurate, and complete.
- 15) Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date.
- 16) 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.

- 17) 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.
- 18) The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
- 19) This permit may be modified, revoked and reissued, or terminated for cause, as provided in 40 CFR Sections 144.39(a), 144.40(a), and 144.41 (1998). 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.
- 20) 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.
- 21) 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. All reports shall contain the certification required in Rule 62-528.340(4), F.A.C.
- 22) The permittee shall notify the Department as soon as possible of any planned physical alterations or additions to the permitted facility. In addition, prior approval is required for activities described in Rule 62-528.410(1)(h), F.A.C.
- 23) The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements.
- 24) The permittee shall report any noncompliance which may endanger health or the environment including:
 - a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
 - b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

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 five 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.

SPECIFIC CONDITIONS:

1. General Requirements

- a. This permit is to construct and operationally test two (2) Class I injection wells (IW-1 and IW-2) and an associated dual zone monitor well (DZMW-1) at the City of Hialeah Reverse Osmosis Water Treatment Facility. This permit does not authorize the construction or testing of any other well or wells associated with the City of Hialeah Reverse Osmosis Water Treatment Facility, except as specified in this permit.
- b. Four permanent surficial aquifer monitor wells, identified as Pad Monitor Wells (PMWs), shall be located near the corners of each of the pads to be constructed for IW-1 and IW-2, and shall be identified by location number and pad location, i.e. NW, NE, SW, and SE. If located in a traffic area the well head(s) must be protected by traffic bearing enclosure(s) and cover(s). Each cover must lock and be specifically marked to identify the well and its purpose. The PMWs shall be sampled as follows:
 - 1) During the construction and associated testing phases, the PMWs shall be sampled weekly for chlorides (mg/L), specific conductance ($\mu\text{mho}/\text{cm}$ or $\mu\text{S}/\text{cm}$), temperature and water level (relative to the North American Vertical Datum of 1988 [NAVD 88]).
 - 2) Initial PMW analyses shall be submitted prior to the onset of drilling activities.
 - 3) The PMWs shall also be sampled for total dissolved solids (mg/L) during the first four weeks of PMW sampling and at all times when specifically requested by the Department

The results of the PMW analyses shall be submitted to the Department with the weekly reports required during construction (see Specific Condition 4.e.). A summary sheet from the FDEP Southeast District is attached for your use when reporting the above information. The PMWs shall be retained in service throughout the construction phase of the project. Upon completion of construction, the City may submit a request for cessation of sampling followed by capping or plugging and abandonment of the wells

- c. 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.
- d. No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water (USDW).

2. Construction and Testing Requirements

- a. The measurement points for drilling and logging construction shall be surveyed and referenced to the North American Vertical Datum (NAVD) of 1988 prior to the onset of drilling activities for this injection well system
- b. Blow-out preventers or equal shall be installed on the respective wells prior to penetration of the Floridan Aquifer System.
- c. No drilling operations shall begin without an approved disposal site for drilling fluids, cuttings, or waste. It shall be the permittee's responsibility to obtain the necessary approval(s) for disposal prior to the start of construction. A detailed disposal plan shall be submitted to the Department prior to the commencement of drilling activities (for the injection and monitor wells).
- d. The Department shall be notified 7 days prior to the mobilization of drilling operations to the site.

- e. Hurricane Preparedness - Upon the issuance of a "Hurricane Watch" by the National Weather Service, the preparations to be made shall include but are not limited to the following:
 - 1) Secure all on-site chemicals, and other stockpiled additive materials to prevent surface and/or ground water contamination.
 - 2) Properly secure drilling equipment and rig(s) to prevent damage to well(s) and on-site treatment process equipment as well as public property.
- f. Waters spilled during construction or testing of the injection well system shall be contained and properly disposed.
- g. Underground Injection Control - Technical Advisory Committee (UIC-TAC) review and Department approval are required prior to the following stages of construction and testing:
 - 1) Contract documents and spud date
 - 2) Intermediate (34-inch) casing seat in the injection wells
 - 3) Final (24-inch) casing seat in the injection wells
 - 4) Final seat for tubing and packer in the injection wells
 - 5) Intermediate (20-inch) casing seat in the monitor well
 - 6) Final (6.875-inch O.D.) casing seat in the monitor well
 - 7) Monitoring zone selection (upper and lower zones)
 - 8) Mechanical integrity testing
 - 9) Short-term injection test
 - 10) Operational testing
- h. The geophysical logging program shall at a minimum include:
 - 1) Prior to setting the 28-inch O.D. conductor casing in Dual Zone Monitor Well DZMW-1, the following geophysical logs shall be run on the pilot hole, to establish a mechanically secure casing setting depth:
 - Caliper
 - Gamma ray
 - 2) Prior to setting the 20-inch O.D. intermediate casing in DZMW-1, the following geophysical logs shall be run on the pilot hole for stratigraphic correlation, identification of the upper monitoring zone, and to aid in the casing seat determination (mechanically secure casing setting depth):
 - Caliper
 - Gamma ray
 - Dual induction and Spontaneous potential
 - Borehole compensated sonic with VDL display
 - Borehole televiwer or Downhole radial color television survey with rotating lens
 - Logs to be run under pumping and static conditions:
 - Flowmeter
 - Temperature
 - Fluid resistivity

* Note: The pumping logs shall be run while pumping the borehole at a rate that adequately stresses the confining units, as shown by head loss across the beds, and allows the log interpreter to clearly identify the confining beds.

- 3) Prior to setting the 6.875-inch O.D. Red Box 1500 FRP final casing in DZMW-1, the following geophysical logs shall be run on the pilot hole for stratigraphic correlation, identification of the lower monitoring zone, and to aid in the casing seat determination (mechanically secure casing setting depth):

- Caliper
- Gamma ray
- Dual induction and Spontaneous potential
- Borehole compensated sonic with VDL display
- Borehole televiewer or Downhole radial color television survey with rotating lens
- Logs to be run under pumping and static conditions:
 - Flowmeter
 - Temperature
 - Fluid resistivity

* Note: The pumping logs shall be run while pumping the borehole at a rate that adequately stresses the confining units, as shown by head loss across the beds, and allows the log interpreter to clearly identify the confining beds.

- 4) Prior to setting the 42-inch O.D. surface casing of the Injection Wells (IW-1 and IW-2), the following geophysical logs shall be run on the pilot hole, to identify the base of the Hawthorn Group at approximately 1,000 feet bls, and to establish a mechanically secure casing setting depth:

- Caliper
- Gamma ray
- Dual induction and Spontaneous potential

- 5) To determine the intermediate (34-inch) casing depth of the Injection Wells (IW-1 and IW-2), the logs indicated below shall be run on the pilot hole. These logs shall be interpreted for stratigraphic correlation, identification of confining units, identification of producing intervals, and to aid in the casing seat determination:

- Caliper
- Gamma ray
- Dual induction and Spontaneous potential
- Borehole compensated sonic with VDL display
- Borehole televiewer or Downhole radial color television survey with rotating lens
- Logs to be run under pumping* and static conditions:
 - Flowmeter
 - Temperature (with differential plot)
 - Fluid resistivity

* Note: The pumping logs shall be run while pumping the borehole at a rate that adequately stresses the confining units, as shown by head loss across the beds, and allows the log interpreter to clearly identify the confining beds. The results of the flowmeter log run under dynamic conditions shall include presentations both in gallons per minute and in percent of flow analysis.

- 6) To determine the final 24-inch casing depth of the Injection Wells (IW-1 and IW-2), the logs indicated below shall be run on the pilot hole. These logs shall be interpreted for stratigraphic correlation, identification of confining units, identification of producing intervals, and to aid in the casing seat determination:
 - Caliper
 - Gamma ray
 - Dual induction and Spontaneous potential
 - Borehole compensated sonic with VDL display
 - Borehole televiewer or Downhole radial color television survey with rotating lens
 - Logs to be run under pumping* and static conditions (to a depth of approximately 2,910 ft bls):
 - Flowmeter
 - Temperature (with differential plot)
 - Fluid resistivity
- 7) In the injection zone of the injection wells (IW-1 and IW-2), the following logs shall be run on the pilot hole:
 - Caliper
 - Gamma ray
 - Dual induction
 - Borehole compensated sonic with VDL display
 - Temperature (with differential plot)
 - Borehole televiewer or Downhole radial color television survey with rotating lens
 - Flowmeter
 - Fluid resistivity
- 8) Caliper and gamma ray logs shall be run on all reamed holes.
- 9) Temperature logs shall be run after each stage of cementing on all casings to identify the top of the cement.
- 10) A cement bond log shall be run after cementing the final casings in Injection Wells IW-1 and IW-2 (24-inch casing), and after cementing the final FRP casing in the dual zone monitor well (6.875-inch O.D. casing). Should the results of the cement bond log run in the dual zone monitor well be inconclusive, the completion of a sector bond log in that well may be required.
- 11) Television surveys shall also be performed (to total depth of well) upon completion of the injection wells (IW-1 and IW-2) and the dual zone monitor well.

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- i. Packer testing shall at a minimum include the following:
 - 1) A combined total of at least twelve (12) straddle packer tests or single off-bottom pumping tests shall be conducted during the drilling of the injection wells (IW-1 and IW-2) and DZMW-1.
 - 2) At least one packer test conducted in each prospective monitoring zone.
 - 3) In each injection well, at least five straddle packer tests will be conducted from the lowermost zone of the USDW to the top of the proposed injection horizon and will be used for the demonstration of confinement. For this reason the packer tests will be performed in the anticipated confining zones. At least one packer test supporting the demonstration of confinement will be obtained from each interval under consideration, based on the data collected to date, to be a confining unit. [See Specific Condition (S.C.) 2.n.]. To the extent feasible, the packer tests in the confining zones shall be performed over intervals that are sufficiently narrow so as not to include high hydraulic conductivity beds.
 - 4) At least three packer tests will be conducted to determine the USDW base. At least one packer test will be conducted at each injection well and monitor well location.
 - 5) Water samples shall be collected from each packer test, and analyzed for total dissolved solids (TDS), chlorides, temperature compensated specific conductance, sulfate, ammonia and total Kjeldahl nitrogen (TKN), at a minimum.
 - 6) A one-liter water sample, obtained from intervals where sufficient water is available, shall be collected at the end of each packer test. In addition, a separate 100 ml sample with nitric acid preservative should be included for metal analysis. These samples shall be shipped to Florida Geological Survey, Hydrogeology Administrator, 903 West Tennessee Street, Tallahassee, Florida 32304.
- j. A combined total of at least ten cores shall be collected during the drilling of IW-1, IW-2 and DZMW-1. A minimum of five cores will be taken during the drilling of the pilot hole in each injection well below the base of the USDW. The main objective of the coring program is to obtain data on the petrophysical properties of the confining strata between the injection zone and the base of the USDW. The core depths shall be staggered between wells so as to obtain samples throughout the confining strata. The cores shall be collected between 1,950 feet and 2,950 feet bls.
- k. The depth of the USDW and the background water quality of the monitoring zones shall be determined during drilling and testing using the following information:
 - 1) Water samples from packer tests with analysis and interpretation.
 - 2) Aquifer performance test data with analysis and interpretation.
 - 3) Geophysical logging upon reaching the total depth of the appropriate pilot hole interval including the following logs: caliper, gamma, dual induction, borehole compensated sonic, pumping flowmeter, temperature, and fluid resistivity.
 - 4) Plots of sonic porosity and apparent formation fluid resistivity (Rwa). Interpretation will include calculation of sonic porosity and Rwa. The input parameters used to make this calculation shall be provided.
- l. The confinement of the injection zone in the injection well system from overlying aquifers shall be monitored using the dual zone monitoring well and a groundwater monitoring program. The intention of this monitoring well system design is to have the upper monitoring zone to be the compliance point with regard to matters of the USDW and to have the lower monitoring zone to be the compliance point with regard to vertical movement out of the injection zone.
 - The **upper interval** shall be positioned in **immediate proximity** to the base of the USDW. This zone must be established within the lowermost portion of the USDW unless it can be demonstrated that no zone is present that can produce adequate water for collection of representative ground water samples. Note, that should this zone be slightly greater than 10,000 mg/L TDS that this zone placement shall be considered a strict interpretation of the rule.

- The **lower interval** shall be positioned in a zone that can produce adequate water for collection of representative ground water samples, below the base of the USDW. The purpose of the lower monitor zone is to verify the effectiveness of the confining unit and external mechanical integrity of the injection well. Accordingly, this zone shall be placed far enough below the base of the USDW to provide the earliest warning of upward migration as early in time as possible, thereby affording the most opportunity for mitigation should the confining unit not perform as expected. Accordingly, this zone shall be placed far enough below the base of the USDW to function as an early warning for fluid movement.

The data and analysis supporting the selection of the monitoring intervals shall be submitted to the Department and UIC-TAC after the collection, interpretation and analysis of all pertinent cores, geophysical logs and analysis of fluid samples. The hydrogeologic evaluation of a proposed monitoring zone will be submitted only after the collection, interpretation and analysis of all pertinent cores, packer tests, geophysical logs and analysis of fluid samples. The Department shall approve the final selection of the specific upper and lower monitoring intervals

- m. To identify the upper and lower monitoring zones, the following information from the injection well and all available on-site sources of data shall be analyzed, interpreted and submitted for UIC-TAC review and Department approval:
 - 1) borehole televiewer or downhole television survey
 - 2) the permeability of the transition zone (transitional regarding TDS) in the vicinity of the USDW
 - 3) packer test data including water quality (TDS, chlorides, sulfate, specific conductance, ammonia and TKN, at a minimum)
 - 4) the specific capacity of the upper and lower monitoring zones
 - 5) the identification of the base of the USDW
- n. Confinement for the injection well locations shall be demonstrated using, at a minimum, directly measured lithologic properties, geophysical evidence, and tests performed while pumping the formation.
- o. Test results pertaining to confinement shall include and/or specifically reference the following informational/quality control items:
 - Information that documents the calibration of tools, including field checks prior to testing.
 - The conditioning/development of the borehole prior to logging, including the techniques used and the time periods in which applied, and
 - Pertaining to packer/pump testing - recording the pumping rate regularly throughout the test to account for possible variations in the pumping rate, and providing information regarding the detection of packer leaks, if any, during testing.
- p. Representative samples of circulation fluid shall be collected during the drilling of the pilot holes of IW-1 and IW-2, and during the drilling of MW-1, as follows:
 - At both IW-1 and IW-2, the representative samples of circulation fluid shall be collected a minimum of every 30 feet in drilling from a depth of approximately 1,000 feet bls to the top of the "Boulder Zone" preliminarily estimated at approximately 2,950 feet bls. The circulation fluid samples shall be analyzed for chlorides, specific conductance, ammonia and TKN, at a minimum.
 - At MW-1, the representative samples shall be collected a minimum of every 30 feet in drilling from a depth of approximately 1,000 feet bls to the total depth of the pilot hole. The circulation fluid samples shall be analyzed for chlorides and specific conductance, at a minimum; these circulation fluid samples shall also be analyzed for ammonia and TKN, unless the permittee affirmatively demonstrates low concentrations of these parameters in the circulation fluid analyzed from the injection wells.

- q. If effluent is encountered or suspected during pilot hole drilling and testing, the Department shall be notified immediately by telephone and in writing and immediate appropriate precautionary measures shall be taken to prevent any upward fluid movement.
- r. Mechanical integrity of the injection wells shall be determined pursuant to Rules 62-528.300(6)(b)1. and 62-528.300(6)(c), F.A.C.
 - 1) A pressure test shall be conducted on each injection well final casing to verify the integrity of each final casing, prior to tubing and packer installation.
 - 2) The pressure test for the annular space (between the final casing and the injection tubing) shall be accepted if tested with a liquid filled annular space at 1.5 times the operating pressure at which the well is to be permitted. A test tolerance of not greater than + or - 5% must be certified by the engineer of record.
 - 3) Verification of pressure gauge calibration must be provided to the Department representative at the time of the test and in the certified test report.
- s. The Department shall be notified at least 72 hours prior to all testing for mechanical integrity.
- t. All testing for mechanical integrity must be initiated during normal business hours, Monday through Friday.
- u. UIC-TAC meetings are scheduled on the 2nd and 4th Tuesday of each month subject to a five working day prior notice and timely receipt of critical data by all UIC-TAC members. Emergency meetings may be arranged when justified to avoid undue construction delays.

3. Quality Assurance/Quality Control Requirements

- a. Pursuant to Rule 62-528.440(5)(b), F.A.C., the Professional Engineer(s) of Record shall certify all documents related to the completion of the Class I injection well system (including the associated Floridan aquifer monitor well) as a disposal facility. The Department shall be notified immediately of any change of the Engineer(s) of Record.
- b. In accordance with Section 492, Florida Statutes, all documents prepared for the geological/hydrogeological evaluation of the injection well system shall be signed and sealed by a Florida Licensed Professional Geologist or qualified Florida Licensed Professional Engineer.
- c. Continuous on-site supervision by qualified personnel (engineer or geologist) is required during all testing, geophysical logging and cementing operations.

4. Reporting Requirements

- a. This project shall be monitored by the Department with the assistance of the TAC, which consists of representatives of the following agencies
 - Department of Environmental Protection, West Palm Beach and Tallahassee
 - Miami-Dade County Dept. of Environmental Resources Management (M-D DERM)
 - United States Geological Survey (USGS), Fort Lauderdale
 - South Florida Water Management District (SFWMD), West Palm Beach

- b. The permittee shall provide copies of all correspondence relative to this permit to each member of the UIC-TAC. Such correspondence includes but is not limited to reports, schedules, analyses and geophysical logs required by the Department under the terms of this permit. The permittee is not required to provide specific correspondence to any UIC-TAC member who submits to the permittee a written request to be omitted as a recipient of specific correspondence.
- c. A drilling and construction schedule shall be submitted to the Department and members of the UIC-TAC prior to site preparation for the injection well system.
- d. The Department and other applicable agencies must be notified of any unusual or abnormal events occurring during construction, and in the event the Permittee is temporarily unable to comply with the provisions of the permit (e.g., on-site spills, artesian flows, large volume circulation losses, equipment damage due to: fire, wind and drilling difficulties, etc.). 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 five 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.
- e. The permittee shall report any noncompliance which may endanger health or the environment, including:
 - 1) Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW; or
 - 2) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between USDWs.

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 five 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.

- f. Weekly progress reports shall be submitted throughout the construction period for the injection wells and dual zone monitor well. These reports, which may be submitted by electronic mail, shall be submitted within 72 hours of the end of the period of record and shall include at a minimum the following information:
 - 1) A cover letter summary of the daily engineer report, driller's log and a projection for activities in the next reporting period.
 - 2) Daily engineers report and driller's/work log with detailed descriptions of all drilling progress, deviation survey results, dates and amount of material added to control flow (salt, mud, etc), cementing, testing, logging, and casing installation activities.
 - 3) Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used.
 - 4) Lithologic logs with cuttings description, formation and depth encountered; geophysical logs and video surveys; and water quality test results including but not limited to the weekly water quality analysis and water levels for the four PMWs.
 - 5) Detailed description of any unusual construction-related events that occur during the reporting period.
 - 6) Details of testing accomplished including (but not limited to) pumping tests, packer tests and core analyses.

- 7) Well development records.
 - 8) Description of any construction problems that developed during the reporting period and current status.
 - 9) Interpretations included with all test results and logs submitted.
 - 10) A certified evaluation of all logging and test results, submitted with test data.
 - 11) Details of cementing operations, including the number of cementing stages, and the following information for each stage of cementing: cement slurry composition, specific gravity, pumping rate, volume of cement pumped, theoretical fill depth, and actual tag depth. From both the physical tag and the geophysical logs, a percent fill shall be calculated. An explanation of any deviation between actual versus theoretical fill shall be provided. Mill certificates shall be provided for dry cement delivered to the site.
- g. Per Rules 62-528.410(4)(c), 62-528.420(4)(c) and 62-528.605(2), F.A.C., the final selection of specific injection and monitoring intervals must be approved by the Department. In order to obtain an approval, the permittee shall submit a request to the Department. The request shall be submitted concurrently to all members of the UIC-TAC. All casing seat requests for the injection wells and the Floridan aquifer monitor well shall be accompanied by technical justification. To the extent possible, each casing seat request should address the following items:
- 1) Lithologic and geophysical logs with interpretations, as the interpretations relate to the casing seat.
 - 2) Water quality data (including but not necessarily limited to TDS concentrations).
 - 3) Identification of confining units, including hydrogeologic data and interpretations.
 - 4) Identification of monitoring zones.
 - 5) Casing depth evaluation (mechanically secure formation, potential for grout seal).
 - 6) Lithologic drilling rate and weight on bit data, with interpretations (related to the casing seat).
 - 7) Identification of the base of the USDW using water quality, Rwa plots, and geophysical log interpretations.
- h. Monitoring zone requests shall contain the following:
- 1) Identification of the base of the USDW.
 - 2) Identification of confining units.
 - 3) Water quality of proposed monitoring zone (including but not necessarily limited to TDS).
 - 4) Transmissivity or specific capacity of proposed monitoring zone.
 - 5) Packer test drawdown curves and interpretation.
- i. An interpretation of all test results and geophysical logs must be submitted with all submittals.
- j. The short-term injection test request shall contain the following justifications:
- 1) Cement bond logs and interpretation.
 - 2) Final downhole television survey with interpretation.
 - 3) Radioactive tracer test results (if the test is to be run using effluent).
 - 4) Demonstration of mechanical integrity, which shall include Items **1)** through **3)** above, and the pressure testing and temperature logging results (if the test is to be run using effluent)
 - 5) Reasonable assurance that adequate confinement exists.
 - 6) Proposed source water to be used (if any untreated source water, must include analysis for primary and secondary drinking water standards (62-550, F.A.C.) as attached). Per Rule 62-528.405(3)(b), F.A.C., if an adequate water supply for the injection test does not exist, and the data collected during drilling provide assurance of the presence of confining bed(s), the applicant shall, after demonstrating mechanical integrity pursuant to Rules 62-528.300(6)(b)2. and (c), F.A.C., be allowed to use an alternate source for testing only with specific prior written authorization from the Department as described in Rule 62-528.100(2), F.A.C.
 - 7) Planned injection procedures.

- k. Upon completion of analysis of cores (when no longer needed by the well owner) and sample cuttings recovered during the construction of the injection wells and dual zone monitor well, the City of Hialeah Department of Water and Sewer shall contact the UIC Section of the Department of Environmental Protection in Tallahassee to arrange their transfer to the Florida State Geologic Survey.
- l. A final report of the construction and testing of the injection wells and dual zone monitor well, shall be submitted no later than 120 days after commencement of operational testing, pursuant to Rule 62-528.430(1)(e), F.A.C. This report shall include, as a minimum, definitions of the injection intervals, all relevant confining units, the depth of the base of the USDW and all monitoring zones, including all relevant data and interpretations.

5. Operational Testing Requirements

- a. The operational testing of the Class I injection Wells System under this permit shall not commence without written authorization from the Department.
- b. Prior to operational testing approval, the following items must be submitted (with the request for operational testing approval) for UIC-TAC review and Department approval:
 - 1) Lithologic and geophysical logs with interpretations.
 - 2) A copy of the borehole television survey of the injection wells with interpretation.
 - 3) Certification of mechanical integrity and interpreted test data.
 - 4) Results of the short-term injection test with interpretation of the data. 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 operating pressure. For a minimum of 12 hours, the injection test rate shall be no less than the maximum rate at which the well is to be permitted. Pressure/water level data from the injection zone and both monitoring zones shall be recorded continuously for at least 24 hours before the test and at least 24 hours following the test. The following data shall be recorded, analyzed, and reported for the duration of the injection test, i.e., all data should encompass the entire background, injection and recovery periods:
 - injection flow rate, in MGD, with all injection periods recorded (IW-1 and IW-2)
 - injection wellhead pressure, in psig (IW-1 and IW-2).
 - pressure, in psig (Injection Wells)
 - pressure with no flow (shut-in pressure in psig; IW-1 and IW-2)
 - monitor well pressures (Dual Zone Monitor Well upper and lower zones)
 - tidal data
 - barometric pressure
 - 5) A description of the actual injection procedure including the anticipated maximum pressure and flow rate at which the well will be operated under normal and emergency conditions.
 - 6) Information concerning the compatibility of the injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone.
 - 7) Certification of completion of well construction.
 - 8) Surface equipment (including piping, pressure gauges and flow meters, and all appurtenances) completion certified by the Engineer of Record.

- 9) Draft operation and maintenance manual, including a description of surge and water hammer control and emergency discharge management plan procedures. The emergency discharge system must be fully constructed and operational (ready to operate) prior to approval of operational testing.
 - 10) Calibration certificates for pressure gauges and flow meters.
 - 11) Signed and sealed record "as-built" engineering drawings of the injection well system including all well construction, subsurface and surface piping and equipment, and appurtenances.
 - 12) The demonstration of confinement for the Injection Wells (IW-1 and IW-2) prepared providing confirmation of confinement and defining the injection and confining sequences utilizing data collected during the drilling, logging and testing of the injection wells and dual zone monitor well. The report shall include the results of hydraulic testing (permeability, porosity, etc.) on the cores, and shall be reviewed and updated as appropriate after the completion of any additional injection/monitor well pairs in the future from the confining interval. This submittal shall be prepared, signed, and sealed by a Florida Registered Professional Geologist or appropriately qualified Professional Engineer.
 - 13) Background water quality data from the monitor and injection zones, analyzed for primary and secondary drinking water standards (62-550, F.A.C.) as attached.
 - 14) Other data obtained during well construction needed by the Department to evaluate whether the well will operate in compliance with Department Rules. [Rule 62-528.450(3)(a)3.i., F.A.C.]
- c. Prior to operational testing, the permittee shall comply with the requirements of Rule 62-528.450(3)(a),(b), and (c), F.A.C.
 - d. Pressure gauges and flow meters shall be installed on the injection well prior to initiating injection activities at the site.
 - e. Prior to the authorization of operational testing by the Department, the City shall contact the UIC Section of the Department, Southeast District, to arrange a site inspection. The inspection will determine if the conditions of the permit have been met and to verify that the injection well system is operational. During the inspection, emergency procedures and reporting requirements shall be reviewed.

6. Operational Testing Conditions

- a. Upon receipt of written authorization from the Department [S.C. **5.a.**], the operational testing of the injection well system shall be subject to the following conditions:
 - 1) A qualified representative of the Engineer of Record shall be present for the start-up operations.
 - 2) The Department shall be notified in writing of the date of commencement operations.
 - 3) The Department and UIC-TAC will monitor the progress of the operational testing phase of this project. UIC-TAC meetings shall be held if necessary to aid the Department in determining if it may be necessary to modify the operational testing conditions. If requested by the Department, reports evaluating the system's progress shall be submitted to the Department and each member of the UIC-TAC at least two weeks prior to the scheduled UIC-TAC meeting. The conditions for the operational testing period may be modified by the Department at each of these UIC-TAC review intervals.

- 4) The flow to the injection wells at the wellhead shall be monitored and controlled at all times to ensure the maximum injection rate does not exceed the rate at which the wells are tested.
- 5) Injection well system monitoring devices:
 - a) Pursuant to Rule 62-528.425(1)(b), F.A.C., the injection well system shall be monitored by continuous indicating, recording and totalizing devices to monitor effluent flow rate and volume, and continuous indicating and recording devices to monitor injection pressure, annular pressure and monitoring zone pressure (or water level, as appropriate; all zones). All indicating, recording and totalizing devices shall be maintained in good operating condition.
 - b) The surface equipment shall be such that manual backup capability to monitor pressure shall be provided for systems utilizing automatic and continuous recording equipment.
- 6) The permittee shall calibrate all pressure gauges, flowmeters, chart recorders, and other related equipment associated with the injection well system on a semiannual basis, at a minimum. 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 USEPA guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauges, flow meter, and chart records shall be calibrated using standard engineering methods.
- 7) The wellhead and associated appurtenances shall be equipped with lightning arrestors, surge capacitors or other similar devices.
- 8) The flow from the monitoring zones during well evacuation and sampling must not be discharged to surface waters or aquifers containing a USDW.
- 9) The wastestream shall be non-hazardous in nature at all times, as defined in 40-CFR, Part 261 and as adopted in Chapter 62-730, F.A.C.
- 10) Only non-hazardous water may be discharged into the wells.
- 11) Mechanical Integrity
 - a) Injection is prohibited until the permittee demonstrates that the wells have mechanical integrity. Prior to operational testing the permittee shall establish, and thereafter maintain, the 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) Within 48 hours of receiving written notice that the well lacks mechanical integrity, unless the Department requires immediate cessation of injection, the permittee shall cease injection into the well unless the Department allows continued injection pursuant to subparagraph (d) below.
 - d) The Department shall allow the permittee to continue operation of the wells that lacks mechanical integrity if the permittee has made a satisfactory demonstration that fluid movement into or between USDWs is not occurring.
- 12) The pressure at the wellhead shall be monitored and controlled at all times to ensure the maximum pressure at the wellhead casing does not exceed 66 percent (%) of the tested pressure on the final casing and injection tubing. [See S.C. 2.r.]

- 13) Any failure of the Class I injection well monitoring and recording equipment for a period of more than 48 hours shall be reported within 24 hours to the Department. A written report describing the incident shall also be given to the Department within five days of the start of the event. The final report shall contain a complete description of the occurrence, a discussion of its cause(s) and the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other information deemed necessary by the Department.
- 14) The injection system shall be monitored in accordance with Rules 62-528.425(1)(g) and 62-528.430(2), F.A.C. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The following injection well performance and monitoring zone data shall be collected and reported to the Department in Monthly Operating Reports (MORs) as indicated below.

a) Injection well performance:

(1) Physical characteristics of the injection wells (IW-1 and IW-2):

Flow rate parameters:

- average daily flow rate to injection well as measured from flowmeter (MGD)
- daily maximum sustained (15 minutes minimum) flow rate to injection well (MGD)
- daily minimum sustained (15 minutes minimum) flow rate to injection well (MGD)
- monthly average of the daily flow rates to injection well (MGD)
- monthly maximum (peak hour) flow rate to injection well (MGD)
- monthly minimum flow rate to injection well (MGD)

Volumetric parameters:

- total daily effluent to injection well from as measured from totalizer (MG)
- total monthly flow volume to injection well (MG)
- monthly average of the daily flow volumes to injection well (MG)
- monthly maximum of the daily flow volumes to injection well (MG)
- monthly minimum of the daily flow volumes to injection well (MG)

Wellhead pressure parameters:

- daily average injection pressure at injection well (psig)
- daily maximum sustained (15 minutes minimum) injection pressure at injection well (psig)
- daily minimum sustained (15 minutes minimum) injection pressure at injection well (psig)
- monthly average injection pressure at injection well (psig)
- monthly maximum sustained injection pressure at injection well (psig)
- monthly minimum sustained injection pressure at injection well (psig)
- monthly wellhead pressure with no flow (shut-in pressure, psig)

Annulus pressure parameters:

- daily average annular pressure at injection well (psig)
- daily maximum annular pressure at injection well (psig)
- daily minimum annular pressure at injection well (psig)
- monthly average annular pressure at injection well (psig)
- monthly maximum annular pressure at injection well (psig)
- monthly minimum annular pressure at injection well (psig)

(2) Chemical characteristics of the wastestream sampled from the wet well:

Monthly sampling:

- temperature ($^{\circ}$ C)
- residue, total filterable (dried at 180° C) [total dissolved solids, TDS] (mg/L)
- chloride (mg/L)
- specific conductance (temperature compensated, μ mho/cm or μ S/cm)
- total suspended solids, TSS (mg/L)
- nitrogen, ammonia, total as N (mg/L)
- nitrogen, total Kjeldahl as N (TKN, mg/L)
- nitrogen, nitrate, total as N (mg/L)
- pH (standard units, s.u.)
- sulfate, total as SO_4 (mg/L)
- gross alpha (ρ Ci/L)
- combined radium-226 and radium-228 (ρ Ci/L)

Quarterly sampling:

- iron (mg/L)
- potassium (mg/l)
- sodium (mg/L)
- calcium (mg/L)
- magnesium (mg/L)
- bicarbonate (mg/L)

The MORs shall indicate monthly averages for all parameters sampled daily.

b) Monitor well performance:

(1) Physical characteristics - upper and lower monitoring zones potentiometric surface or water table height relative to NAVD 88 (feet of head) or pressure (psig) referenced to NAVD 88:

- daily maximum pressure or water level (as appropriate)
- daily minimum pressure or water level (as appropriate)
- daily average pressure or water level (as appropriate)
- monthly maximum pressure or water level (as appropriate)
- monthly minimum pressure or water level (as appropriate)
- monthly average pressure or water level (as appropriate)

(2) Chemical characteristics of the upper and lower monitoring zones:

Weekly sampling:

- temperature, ($^{\circ}$ C)
- residue, total filterable (dried at 180° C) [total dissolved solids, TDS] (mg/L)
- chloride (mg/L)
- specific conductance (temperature compensated, μ mho/cm or μ S/cm)
- nitrogen, ammonia, total as N (mg/L)
- nitrogen, total Kjeldahl as N (TKN, mg/L)
- nitrogen, nitrate, total as N (mg/L)
- pH (standard units, s.u.)
- sulfate, total as SO_4 (mg/L)

The MORs shall also indicate monthly averages for all parameters sampled weekly.

Monthly sampling:

- gross alpha (pCi/L)
- combined radium-226 and radium-228 (pCi/L)
- iron, (mg/L)
- potassium, (mg/l)
- sodium, (mg/L)
- calcium, (mg/L)
- magnesium, (mg/L)
- bicarbonate, (mg/L)

- c) After the upper and lower monitoring zones have been sampled weekly for at least six months, the permittee may submit data for UIC-TAC review and Department approval to demonstrate that reasonable assurance of groundwater stability has been established in justification of any request to reduce the sampling frequency to monthly. The request for reduction in sampling frequency shall be accompanied by technical justification and interpretations.
- 15) A minimum of three well volumes of fluid shall be evacuated from the monitoring systems prior to sampling for the chemical parameters listed above. A State-certified laboratory shall analyze all samples. Sufficient purging shall have occurred when either of the following have occurred:
- a) pH, specific conductivity and temperature when sampled, upon purging the third or subsequent well volume, each vary less than 5% from that sampled upon purging the previous well volume; or
 - b) upon purging the fifth well volume.
- 16) All samples must be collected and analyzed in accordance with the quality assurance/quality control (QA/QC) requirements of Rule 62-160, F.A.C.
- 17) All injection well system data submissions including MORs shall be clearly identified on each page with facility name, I.D. Number, permit number, operator's name, license number, daytime phone number, date of sampling/recording, and type of data. Monitoring zones shall be identified by well number and depth interval. The lead plant operator or higher official must sign and date each submittal. An approved summary sheet from the FDEP Southeast District UIC Section is attached.
- 18) The permittee shall submit monthly to the Department the results of all injection wells and monitor well data required by this permit (MORs) **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's Southeast District Office (FDEP, UIC Section, 400 N. Congress Avenue, Suite 200, West Palm Beach, FL 33401). 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.

- 19) A controlled monthly injectivity test (rate/pressure) shall be conducted on IW-1 and IW-2 in accordance with Rule 62-528.430(2)(d), F.A.C. This test shall be conducted at a rate that approaches the maximum design flow but which can be repeated on a monthly basis. The injectivity test results shall be reported to the Department in the MORs. The following data shall be recorded and reported:

Parameters pertinent to flow rate:

- injection flow rate as measured from flowmeter (MGD)
- initial totalizer reading (gallons)
- final totalizer reading (gallons)
- time (minutes) from initial to final totalizer readings

Pressure parameters:

- static injection wellhead pressure (psig)
- wellhead injection pressure fall-off — every 30 seconds until again static (psig)
- final pressure upon test cessation — approximately 10-15 minutes (psig)
- wellhead pressure with no flow (shut-in pressure in psig)
- monitoring zone pressures (psig)

Specific Injectivity shall be reported in gpm/psig.

All readings shall be taken after a minimum 5-minute period of stabilized flow.

Pursuant to Rule 62-528.430(2)(d), F.A.C., as part of the specific injectivity test, each well shall be shut-in for a period of time necessary to conduct a valid observation of pressure fall-off.

20) Wastestream analysis:

- a) A wastestream analysis (24 hour composite sample) for primary and secondary drinking water standards (Chapter 62-550, F.A.C.) and minimum criteria, see attached list, shall be submitted within one month of the commencement of operational testing.
- b) Pursuant to Rules 62-528.425(1)(a) and 62-528.450(2)(f)3., F.A.C., a wastestream analysis for primary and secondary drinking water standards (Chapter 62-550, F.A.C.) see attached list, shall be submitted annually (sampled in February and **submitted on or before April 30**).

7. Surface Equipment

- a. The integrity of the monitoring zone sampling systems shall be maintained at all times. Sampling lines shall be clearly and unambiguously identified by monitoring zone at the point at which samples are drawn. All reasonable and prudent precautions shall be taken to ensure that samples are properly identified by monitoring zone and that samples obtained are representative of those zones. Sampling lines and equipment shall be kept free of contamination with independent discharges and no interconnections with any other lines.
- b. The surface equipment for the injection well system shall maintain compliance with Chapter 62-600, F.A.C. for water hammer control, screening, access for logging and testing, and reliability and flexibility in the event of damage to the well and effluent piping. A regular program of exercising the valves integral to the wellhead shall be instituted. At a minimum, all valves integral to the wellhead shall be exercised during the regularly scheduled quarterly injectivity testing.

- c. The injection wells and monitor well surface equipment and piping shall be kept free of corrosion at all times.
- d. Spillage onto the injection well pad during construction activities, and any waters spilled during mechanical integrity testing, other maintenance, testing or repairs to the system shall be contained by an impermeable wall around the edge of the pad. The spilled waters shall be directed to a sump which in turn discharges to the pumping station wet well or via other approved means to the injection well system.
- e. An injection well construction pad with impermeable perimeter retaining wall shall be maintained and retained in service for the life of the injection wells. The injection and monitor well pad(s) are not, unless specific approval is obtained from the Department, to be used for storage of any material or equipment at any time.

8. Financial Responsibility

- 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 update annually the cost estimate for plugging and abandonment, and submit each updated cost estimate annually to the Department. If during the duration of this permit the cost estimate exceeds that upon which financial responsibility is based (\$300,000) by 10 percent or more, the City of Hialeah Department of Water and Sewer will need to obtain new *Certification of Financial Responsibility* forms and Comprehensive Annual Financial Reports and submit these documents to the Department for approval. A copy of the annual update shall be submitted to the Department's West Palm Beach and Tallahassee UIC programs each year within 60 days after the anniversary date of issuance of this permit.
- c. In the event 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 then 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.

9. Emergency Disposal

- a. All applicable federal, state, and local permits shall be in place to allow for any alternate discharges due to emergency or planned outage conditions.
- b. Any proposed changes in emergency disposal methods shall be submitted for UIC-TAC and USEPA review and Department approval prior to implementation.
- c. In the event of an emergency and/or discharge, or other abnormal event where the Permittee is temporarily unable to comply with any of the conditions of this permit due to breakdown of equipment, power outages, destruction by hazard or fire, wind, or by other cause, the Department shall be notified in person or by telephone within 24 hours of the incident. A written report describing the incident shall also be submitted to the Department within five days of the start of the incident. The written report shall contain a complete description of the emergency and/or discharge, a discussion of its cause(s), and if it has been corrected, the anticipated time the discharge is to continue, the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other information deemed necessary by the Department.

- d. The emergency disposal method consists of the following:
- 1) The emergency disposal method presented in the permit application received May 27, 2008 and approved by the Department as a part of this permit, shall be maintained in fully operational order at all times.
 - 2) The emergency disposal method includes termination of reject concentrate. In the unlikely event that one of the injection wells must be shut-in for routine service or testing, or for an emergency condition, the entire concentrate flow could be sent to the other injection well. In the event that both injection wells and the concentrate pump station could not be operated, the reverse osmosis water treatment facility would be shut-down, which would terminate the generation of concentrate. The City of Hialeah would be supplied water from its surficial aquifer water treatment facility, which could be supplemented with water from neighboring utilities.
 - 3) Any emergency bypass of the injection well system shall be governed by Rule 62-620.610, F.A.C.
 - 4) Any proposed changes in emergency disposal methods shall be submitted for UIC-TAC review and Department approval prior to implementation.

10. Signatories

- a. 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.
- b. 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 on 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."

11. Permit Extension(s), Renewal(s) and Operation Permit Application(s)

- a. Pursuant to Rule 62-4.080(3), a permittee may request that a permit be extended as a modification of an existing permit. A request for an extension is the responsibility of the permittee and shall be submitted to the Department before the expiration of the permit. In accordance with Rule 62-4.070(4), F.A.C., a permit cannot be extended beyond the maximum 5-year statutory limit. Should operational testing need to continue beyond the 5-year limit for this permit, the permittee must renew the construction permit in accordance with S.C. **10.b.** below.


Amando Vidal, P.E., Director
City of Hialeah Department of Water and Sewer
Class I Test/Injection Wells IW-1 & IW-2
Page 24 of 24

Permit Number: 0289249-001-UC
Date Issued: July 22, 2009
Expiration Date: July 21, 2012

- b. 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.

Issued this 22 day of July, 2009

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION


to Jack Long
District Director
Southeast District


JL/LAB/JRM/jgs

**SOUTHEAST DISTRICT UIC SECTION
SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT**

FACILITY NAME _____

REPORT MONTH/YR. _____

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # _____ PERMIT # _____

SAMPLING DATE _____ TIME _____

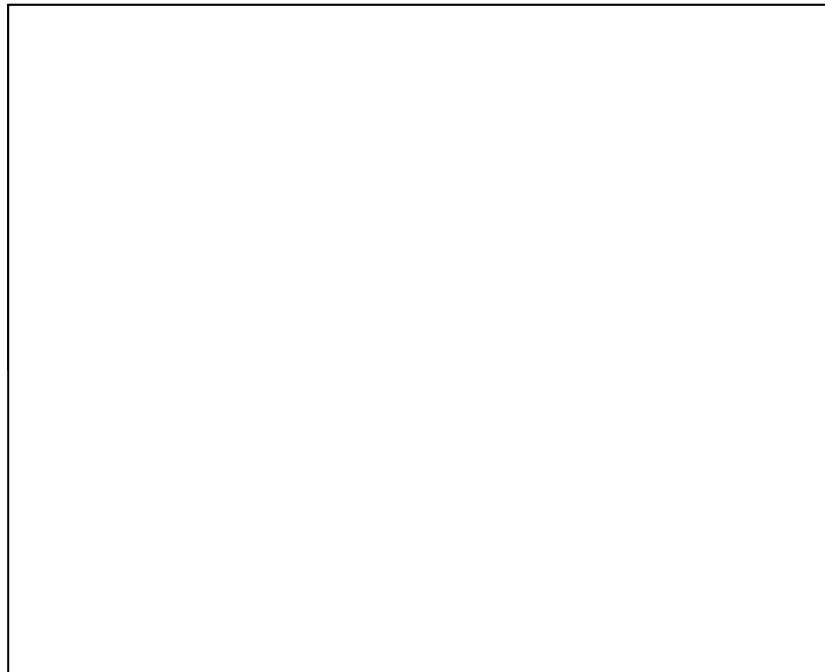
	SAMW #1	SAMW #2	SAMW #3	SAMW #4
LOCATION	NE CORNER	NW CORNER	SE CORNER	SW CORNER
ELEV. OF TOC* (NAVD 88)				
DEPTH TO WATER (TOC*)				
WATER LEVEL (NAVD 88)				
CHLORIDE (mg/l)				
CONDUCTIVITY(μmhos/cm)				
TOTAL DISOLV. SOLIDS (mg/l)				
TEMPERATURE (° F.)				

* TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY _____ SAMPLED BY _____

PHONE # _____ TITLE _____

SITE PLAN OF SAMW LOCATIONS



PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated February 1, 2007

Page 1 of 3

PRIMARY DRINKING WATER STANDARDS

PARAMETER

Alachlor (Polychlorinated Biphenyl or PCB)
Aldicarb
Aldicarb sulfoxide
Aldicarb sulfone
Alpha, Gross
Antimony
Arsenic
Atrazine
Barium
Benzene
Benzo(a)pyrene
Beryllium
Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
Bromate
Cadmium
Carbofuran
Carbon Tetrachloride (Tetrachloromethane)
Chlordane
Chlorine
Chlorine Dioxide
Chlorite
Chlorobenzene (Monochlorobenzene)
Chloroethylene (Vinyl Chloride)
Chromium
Coliforms, Total
Cyanide
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dalapon (2,2-Dichloropropionic acid)
Dibromochloropropane (DBCP)
1,2-Dibromoethane (EDB, Ethylene Dibromide)
1,2-Dichlorobenzene (o-Dichlorobenzene)
1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (Vinylidene chloride)
1,2-Dichloroethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
cis-1,2-Dichloroethylene (1,2-Dichloroethylene)
trans-1,2-Dichloroethylene (1,2-Dichloroethylene)
Dichloromethane (Methylene chloride)
1,2-Dichloropropane
Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
Dinoseb
Diquat
EDB (Ethylene dibromide, 1,2-Dibromoethane)
Endothall
Endrin
Ethylbenzene
Ethylene dichloride (1,2-Dichloroethane)
Fluoride
Glyphosate (Roundup)
Gross Alpha
Haloacetic acids (HAA5)
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
gamma-Hexachlorocyclohexane (Lindane)
Hexachlorocyclopentadiene
Lead

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated May 6, 2002

Page 2 of 3

PRIMARY DRINKING WATER STANDARDS, CONT'D

PARAMETER

Lindane (gamma-Hexachlorocyclohexane)
Mercury
Methoxychlor
Methylene chloride (Dichloromethane)
Monochlorobenzene (Chlorobenzene)
Nickel
Nitrate (as N)
Nitrite (as N)
Total Nitrate + Nitrite (as N)
Oxamyl
p-Dichlorobenzene or Para Dichlorobenzene (1,4-Dichlorobenzene)
Pentachlorophenol
Perchloroethylene (Tetrachloroethylene)
Picloram
Polychlorinated biphenyl (PCB or Aroclors)
Radium
Roundup (Glyphosate)
Selenium
Silver
Silvex (2,4,5-TP)
Simazine
Sodium
Strontium-90
Styrene (Vinyl benzene)
Tetrachloroethylene (Perchloroethylene)
Tetrachloromethane (Carbon Tetrachloride)
Thallium
Toluene
Toxaphene
2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene, TCE)
Trihalomethanes, Total
Vinyl Chloride (Chloroethylene)
Xylenes (total)

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated May 6, 2002

Page 3 of 3

SECONDARY DRINKING WATER STANDARDS

PARAMETER

Aluminum
Chloride
Color
Copper
Ethylbenzene
Fluoride
Foaming Agents (MBAS)
Iron
Manganese
Odor
pH
Silver
Sulfate
Toluene
Total Dissolved Solids (TDS)
Xylenes
Zinc

Appendix B

IW-1

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



November 13, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 1) – Well IW-1
November 6 through November 13, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from November 6, 2009 at 0700 hours through November 13 at 0700 hours. Youngquist Brothers Inc. (YBI) began drilling IW-1 on November 7, 2009. A 52-inch pit casing was set to a depth of 155 feet below pad level on November 10, 2009. A 12.25-inch pilot hole was completed to 283 feet below pad level at the end of the report period. A weekly construction summary is attached to this letter along with daily logs, lithologic logs, inclination survey summary, geophysical logs, and pad well monitoring data.

Activities scheduled for next week include the completion of the 12.25-inch diameter pilot hole to approximately 1,000 feet below pad level and reaming of pilot hole. Please note drilling of IW-2 is anticipated to begin on November 16, 2009 or November 17, 2009.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a faint circular official seal of the Florida Department of Environmental Protection.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Geophysical logs
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



November 20, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 2) – Well IW-1
November 13 through November 20, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from November 13, 2009 at 0700 hours through November 20 at 0700 hours. Youngquist Brothers Inc. completed the drilling and geophysical logging of a 12.25-inch pilot hole to a depth of 1,100 feet below pad level (bpl). The 12.25-inch pilot hole was reamed to a 50-inch borehole to a depth of 791 feet bpl as of the end of this report period. A weekly construction summary is attached to this letter along with daily logs, lithologic logs, inclination survey summaries, geophysical logs, and pad well monitoring data. I will mail paper copies of the geophysical logs to your office and the FDEP Tallahassee office.

Activities scheduled for next week include the reaming of the 50-inch borehole to a total depth and setting of a 42-inch diameter surface casing to 1,075 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. Hoffman", written over a circular, faint background stamp.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summaries
- 5) Geophysical logs
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



November 30, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 3) – Well IW-1
November 20 through November 27, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from November 20, 2009 at 0700 hours through November 27 at 0700 hours. Youngquist Brothers Inc. completed the reaming of the 12.25-inch pilot hole to a 50.5-inch borehole on November 23, 2009. The 50.5-inch borehole was completed to a depth of 1079 feet bpl. Geophysical logging was performed on the mudded borehole on November 26, 2009. A weekly construction summary is attached to this letter along with daily logs, lithologic logs, inclination survey summary, geophysical logs, and pad well monitoring data. I will mail paper copies of the geophysical logs to your office and the FDEP Tallahassee office.

Activities scheduled for next week include the cementing of the 42-inch surface casing to a depth of 1,075 feet bpl, conversion of the drill rig to reverse air, and drilling of a 12.25-inch pilot hole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a faint circular official stamp.

David L. Hoffman, P.G.
Hydrogeologist

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Geophysical logs
- 6) Pad monitoring well data



VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Geophysical logs
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 14, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 5) – Well IW-1
December 4, 2009 through December 11, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from December 4, 2009 at 0700 hours through December 11, 2009 at 0700 hours. Youngquist Brothers, Inc. completed the 12.25-inch diameter pilot hole to a depth of 2,156 feet bpl on December 5, 2009. Geophysical and video logging of the 12.25-inch diameter borehole was performed on December 5, 2009 through December 7, 2009. Paper copies of the geophysical logs (caliper, gamma ray, dual induction and spontaneous potential, borehole compensated sonic with VDL and log derived TDS, flowmeter [static and dynamic], and fluid conductivity/temperature [static and dynamic]) and a DVD of the video logs were delivered to your office on December 9, 2009. Copies of these geophysical logs are also attached to this email.

The log derived total dissolved solids (TDS) identified a TDS concentration of 10,000 milligram per liter (mg/L) at an approximate depth of 1,875 feet bpl. An exhibit showing the log derived TDS is attached to this email. Packer test number 1 was performed on December 7th and 8th between the depths of 1,839 to 1,856 feet bpl. Packer test number 2 was performed on December 8th and December 9th between the depths of 1,899-1,916 feet bpl. These two packer test zones are located above and below the log identified depth of the base of the USDW. Groundwater samples collected from the zones were submitted to a laboratory for analyses. Based on the analytical laboratory results, TDS was measured at a concentration of 6,360 mg/L in the packer test number 1 zone (1,839-1,856 feet bpl). TDS was measured by the analytical laboratory at a concentration of 16,100 mg/L in the packer test number 2 zone (1,899-1,916 feet bpl). The water quality analyses verify that the base of the USDW is located at an approximate depth of 1,875 feet bpl. A formal request to set the 34-inch intermediate casing to a depth of 1,900 feet bpl will be forthcoming. Packer test

number 3 was completed at a depth of 1,973-1991 feet bpl on December 9th and 10th. Water quality data from packer test number 3 was not available at the time this report was prepared.

Activities scheduled for next week include grouting of the 12.25-inch diameter pilot hole, obtaining FDEP approval to set the 34-inch (0.375-inch wall steel) intermediate casing to a depth of 1,900 feet bpl, reaming the 12.25-inch pilot hole to 42-inch diameter, geophysical logging, and installation of the 34-inch intermediate casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Log derived water quality exhibit
- 4) Packer test water sample results summary and lab reports
- 5) Lithological log
- 6) Inclination survey summary
- 7) Geophysical logs
 - Caliper
 - Gamma ray
 - Dual induction and spontaneous potential

- Borehole compensated sonic with VDL and log derived TDS
 - Flowmeter [static and dynamic]
 - Fluid conductivity/temperature [static and dynamic])
- 8) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 18, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 6) – Well IW-1
December 11, 2009 through December 18, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from December 11, 2009 at 0700 hours through December 18, 2009 at 0700 hours. Youngquist Brothers, Inc. cement grouted the 12.25-inch diameter pilot hole from 2,156 to 1,139 feet bpl on December 11th and 12th. Your office gave approval to seat the 34-inch diameter intermediate casing to a depth of 1,900 feet bpl on December 16, 2009. A 40.5-inch diameter borehole was completed to a depth of 1,658 feet bpl at the end of this report period.

Activities scheduled for next week include the completion of the 40.5-inch diameter borehole to a depth of approximately 1,900 feet bpl, geophysical logging of the 40.5-inch diameter borehole, and setting of the 34-inch intermediate casing to a depth of 1,900 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist





Copy via electronic mail only:

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 28, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 7) – Well IW-1
December 18, 2009 through December 25, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from December 18, 2009 at 0700 hours through December 25, 2009 at 0700 hours. Youngquist Brothers, Inc. completed the construction of a 40.5-inch diameter borehole in preparation for seating a 34-inch diameter intermediate casing to a depth of 1,900 feet bpl on December 20, 2009. No drilling or testing was performed on IW-1 between December 21st and 25th.

Activities scheduled for next week include geophysical logging of the 40.5-inch diameter borehole, cementing of the 34-inch diameter intermediate casing to a depth of 1,900 feet bpl, coring, and packer testing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. Hoffman", written over a horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
Cathy McCarty, P.G., (FDEP – Tallahassee): cathleen.mccarty@dep.state.fl.us
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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

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January 4, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 8) – Well IW-1
December 25, 2009 through January 1, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from December 25, 2009 at 0700 hours through January 1, 2010 at 0700 hours. The drill rig was shut down on December 25, 2009. Youngquist Brothers performed geophysical logging of the 40.5-inch diameter borehole in preparation of installation of the 34-inch diameter intermediate casing on December 26, 2009. The intermediate casing was seated at a depth of 1,900 feet bpl on December 27, 2009. The intermediate casing was then cemented in place via six stages completed between December 28th and 31st. A cement log was run in between each stage.

Activities scheduled for next week include completion of a 12.25-inch diameter pilot hole, coring, and packer testing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, followed by a circular official seal of the Florida Department of Environmental Protection. The seal contains the text "FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION" and "OFFICIAL SEAL".

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Geophysical logs
 - Caliper and Gamma Ray of 40.5-inch borehole
 - Cement Top Temperature Log
- 5) Inclination survey summary (from week 7)
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 8, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 9) – Well IW-1
January 1, 2010 through January 8, 2010
FDEP File No. 0289249-001-UC


Dear Gardner:


Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from January 1, 2010 at 0700 hours through January 8, 2010 at 0700 hours. Youngquist Brothers drilled a 12.25-inch diameter pilot hole from a depth of 1,890 to 2,515 feet bpl during the report period. Two cores were collected at depths of 2,206 to 2,216 feet bpl and 2,303 to 2,313 feet bpl during the report period.

Activities scheduled for next week include continued drilling of the 12.25-inch diameter pilot hole, coring, and packer testing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist

A circular professional seal for David L. Hoffman, P.G., Hydrogeologist. The seal contains the text "DAVID L. HOFFMAN", "P.G.", "HYDROGEOLOGIST", and "FLORIDA". The number "1" is written at the bottom of the seal.

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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

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January 15, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 10) – Well IW-1
January 8, 2010 through January 15, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from January 8, 2010 at 0700 hours through January 15, 2010 at 0700 hours. Youngquist Brothers collected core no. 3 (2,505-2,513 feet bpl), core no. 4 (2,730-2,746 feet bpl), and core no. 5 (2,816-2,831 feet bpl) in the report period. Core recovery ranged between 89% and 100% for the three completed cores. A 12.25-inch diameter pilot hole was completed between each of the core intervals and to a depth of 2,890 feet bpl at the end of the report period.

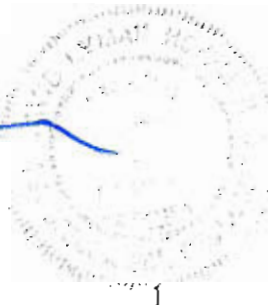
Activities scheduled for next week include continued drilling of the 12.25-inch diameter pilot hole and packer testing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 22, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 11) -- Well IW-1
January 15, 2010 through January 22, 2010
FDEP File No. 0289249-001-UC


Dear Gardner:

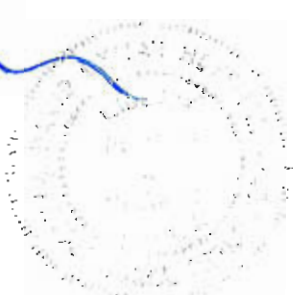
Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from January 15, 2010 at 0700 hours through January 22, 2010 at 0700 hours. Youngquist drilling a 12.25-inch diameter pilot hole from 2,961 to 3,375 feet bpl during the report period.

Activities scheduled for next week include completion of the 12.25-inch diameter pilot hole to an estimated depth of 3,500 feet bpl, geophysical logging, backplugging, and reaming.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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January 29, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 12) – Well IW-1
January 22, 2010 through January 29, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from January 22, 2010 at 0700 hours through January 29, 2010 at 0700 hours. Youngquist drilled a 12.25-inch diameter pilot hole from 3,375 to 3,500 feet bpl during the report period. Geophysical logs (static and dynamic) and downhole video were run on the entire 12.25-inch diameter pilot hole from the base of the intermediate casing at 1,900 feet bpl to the total depth of 3,500 feet bpl on January 24, 2010. Borehole televiewer data was collected from 1,900 to 2,490 feet bpl on January 25, 2010. Paper copies of the geophysical logs and DVDs copies of the borehole televiewer data and downhole video were sent to your office via Federal Express in preparation for an injection casing seat request. Packer tests number 4 (2,234 - 2,251.5 ft bpl) and packer test number 5 (2,399 - 2,416.5 feet bpl) were completed during the report period. Packer test number 6 (2,639-2,656.5 feet bpl) started on January 28, 2010 and continued at the end of this report period.

Activities scheduled for next week include placement of a cement bridge plug and backplugging of the 12.25-inch diameter pilot hole above the boulder zone to the base of the intermediate casing at 1,900 feet bpl. Youngquist will ream a 34-inch diameter borehole from the base of the 34-inch diameter intermediate casing to approximately 2,980 feet bpl. A formal request to seat the injection casing will be submitted.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Geophysical Logs
 - Caliper & Gamma Ray
 - Borehole Compensated Sonic with VDL
 - Dual Induction with Spontaneous Potential
 - Flowmeter (static and dynamic)
 - Fluid Conductivity and Temperature (static and dynamic)
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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February 5, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 13) – Well IW-1
January 29, 2010 through February 5, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from January 29, 2010 at 0700 hours through February 5, 2010 at 0700 hours. Packer test number 6 (2,639-2,656.5 feet bpl) was completed on January 29, 2010. A cement bridge plug was placed in the 12.25-inch diameter pilot hole at an approximate depth of 3,030 feet bpl on January 29, 2010 and January 30, 2010. The 12.25-inch diameter pilot hole was then backplugged via 12 cement stages up to 1,990 feet bpl on February 1, 2010. Reaming of a 32.5-inch diameter borehole to a depth of 2,240 feet bpl was also completed in the report period.

Activities scheduled for next week include continued reaming of a 32.5-inch borehole to a depth of 2,980 feet bpl followed by reaming of a 24-inch diameter borehole to 3,500 feet bpl. Approval to seat the 24-inch injection casing at a depth of 2,980 feet bpl was granted by your office on February 5, 2010.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a circular embossed seal.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

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February 12, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 14) – Well IW-1
February 5, 2010 through February 12, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from February 5, 2010 at 0700 hours through February 12, 2010 at 0700 hours. Reaming of a 32.5-inch diameter borehole from a depth of 2,238 to 2,495 feet bpl was completed during the report period.

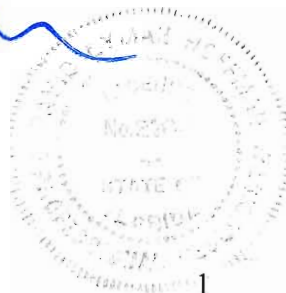
Activities scheduled for next week include continued reaming of a 32.5-inch borehole to a depth of 2,980 feet bpl followed by reaming of a 24-inch diameter borehole to 3,500 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a circular official stamp.

David L. Hoffman, P.G.
Hydrogeologist



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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data



VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 15) – Well IW-1
February 12, 2010 through February 19, 2010
FDEP File No. 0289249-001-UC

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from February 12, 2010 at 0700 hours through February 19, 2010 at 0700 hours. Youngquist completed the reaming of a 32.5-inch diameter borehole from a depth of 2,495 to 2,970 feet bpl. A stepped borehole (32.5 to 22.5-inch diameter) was completed between 2,970 and 2,974 feet bpl and a 22.5-inch diameter ream was completed to 3,024 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffmann, D.C.

Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



February 26, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 16) – Well IW-1
February 19, 2010 through February 26, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from February 19, 2010 at 0700 hours through February 26, 2010 at 0700 hours. A 22.5-inch diameter borehole was reamed between 3,024 and 3,208 feet bpl.

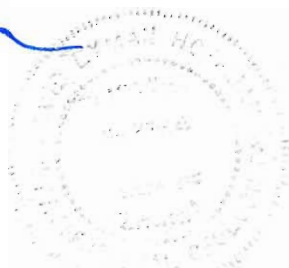
Activities scheduled for next week include continued reaming of a 22.5-inch borehole to a depth of 3,500 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue circular stamp.

David L. Hoffman, P.G.
Hydrogeologist





Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Pad monitoring well data

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March 5, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 17) – Well IW-1
February 26, 2010 through March 5, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from February 26, 2010 at 0700 hours through March 5, 2010 at 0700 hours. The 22.5-inch diameter borehole was reamed from 3,208 to a total depth of 3,505 feet bpl during the report period. Geophysical logging of the 22.5-inch diameter borehole was completed last night.

Activities scheduled for next week include installation and cementing of the 24-inch diameter injection casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithological log
- 4) Inclination survey summary
- 5) Geophysical logs (caliper and gamma ray)
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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March 12, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 18) – Well IW-1
March 5, 2010 through March 12, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from March 5, 2010 at 0700 hours through March 12, 2010 at 0700 hours. The 24-inch diameter injection casing was welded and lowered to a depth of 1,974.5 feet bpl between March 6, 2010 and March 7, 2010. The 24-inch diameter injection casing was cemented in place via multiple stages between March 8, 2010 and the end of this report period. Activities scheduled for next week include continued cementing of the 24-inch diameter injection casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist





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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Lithology log
- 4) Pad monitoring well data

1567 Hayley Lane, Suite 202
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March 19, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 19) – Well IW-1
March 12, 2010 through March 19, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from March 12, 2010 at 0700 hours through March 19, 2010 at 0700 hours. The final cementing (stages 6 through 14) of the 24-inch diameter injection casing was completed between March 12 and March 14th. A cement bond log was completed on March 16, 2010. A pressure test of the 24-inch diameter injection casing was successfully performed on March 17, 2010. The 24-inch diameter injection casing was cemented (stage 15) to the land surface on March 17, 2010. The fiberglass tubing was installed on March 18, 2010.

Activities scheduled for next week include sampling of IW-1 for primary and secondary drinking water standard list of parameters, demobilization of the drill rig, removal of the drilling pad, and cutting of the wellhead off below ground. The drill rig and drilling pad will be set up on dual-zone monitor well DZMW-1.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, followed by a circular official seal of the Florida Department of Environmental Protection. The seal contains the text "FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION" and "OFFICIAL SEAL".

David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) 24-inch diameter injection casing pressure test results
- 4) Cement top temperature log
- 5) Cement bond log
- 6) Lithology log
- 7) Pad monitoring well data

1567 Hayley Lane, Suite 202
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Tel. 1 239 481 6494
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March 26, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 20) – Well IW-1
March 19, 2010 through March 26, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-1. This report covers the period from March 19, 2010 at 0700 hours through March 26, 2010 at 0700 hours. The annular space between the injection casing and fiberglass tubing was filled with a corrosion inhibitor on March 19, 2010. Rigging down of the drill rig was completed the entire week in preparation for set up of the same drill rig on the dual-zone monitor well. IW-1 was developed and sampled for primary and secondary drinking water standards on March 24, 2010. The casing of IW-1 was cut below land surface on March 25, 2010.

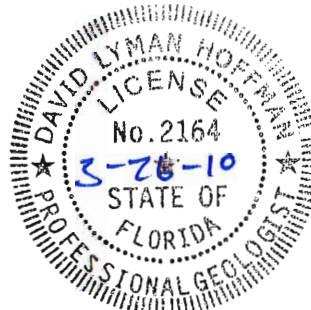
All remaining work on IW-1 is temporarily on hold until completion of DZMW-1. Weekly construction reports for IW-1 will be discontinued until work restarts. Sampling and laboratory analyses of groundwater in pad monitor wells located around IW-1 will continue as required.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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May 14, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 27)
May 7, 2010 through May 14, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 7, 2010 at 0700 hours through May 14, 2010, 2010 at 0700 hours. The following sections provide a summary of work completed during the report period and work that will be performed in the next week.

DZMW-1

During the report period, the upper and lower zones of the monitoring well were developed and sampled for primary and secondary drinking water standards on May 10, 2010. Work on DZMW-1 is complete.

IW-1

During the report period, the annulus of IW-1 was pressure tested on May 13, 2010. A 24-hour background period will start on May 16, 2010 at approximately 0700 hours, followed by a 12-hour injection test on May 17, 2010, which will then be followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, gamma ray log, and radioactive tracer test will be run on May 18, 2010 and May 19, 2010.

IW-2

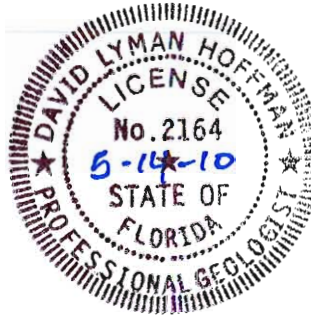
During the report period, a 24-hour background monitoring phase prior to the injection test was completed on May 10, 2010, followed an injection test May 11, 2010 and a 24-hour recovery phase on May 12, 2010. Temperature and gamma ray logging along with a radioactive tracer test was performed on May 13, 2010. All work on IW-2 is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1 and IW-2
- 2) Daily logs for IW-1 and IW-2
- 3) IW-1 annulus pressure test summary
- 4) Pad monitoring well data (IW-1 and IW-2)

1567 Hayley Lane, Suite 202
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May 21, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 28)
May 14, 2010 through May 21, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 14, 2010 at 0700 hours through May 21, 2010 at 0700 hours. As per your request, this is the last weekly construction report. Future reports will be submitted every other week and will only be sent to your attention. The following sections provide a summary of work completed during the report period and work that will be completed within the next two weeks.

DZMW-1

A submersible pump will be installed in the lower monitoring zone during the next two weeks.

IW-1

During the report period a 24-hour background monitoring phase prior to the injection test was completed on May 16, 2010, followed by a 12-hour injection test on May 17, 2010, which was then followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, and gamma ray log were also completed on May 18, 2010. A radioactive tracer test was completed on May 19, 2010. Work on this injection well is complete.

IW-2

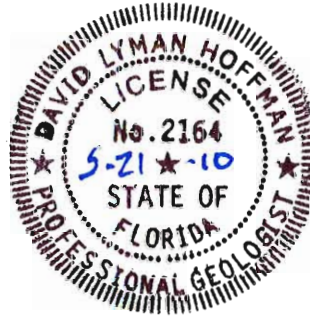
Work on this injection well is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1
- 2) Daily logs for IW-1
- 3) Radioactive Tracer Test log
- 4) Pad monitoring well data (IW-1 and IW-2)

IW-2

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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November 20, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 2) – Well IW-2
November 13 through November 20, 2009
FDEP File No. 0289249-001-UC


Dear Gardner:


Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from November 13, 2009 at 0700 hours through November 20 at 0700 hours. Youngquist Brothers Inc. began drilling of IW-2 on November 18, 2009. A 60.5-inch borehole was completed to a depth of 158 feet below pad level (bpl) on November 19, 2009. Geophysical logging of the 60.5-inch borehole was also completed on November 20, 2009. A weekly construction summary is attached to this letter along with daily logs, inclination survey summary, geophysical logs, and pad well monitoring data. I will mail paper copies of the geophysical logs to your office and the FDEP Tallahassee office.

Activities scheduled for next week include the reaming of the 50-inch borehole to an anticipated depth of 1,100 feet bpl and setting of a 42-inch diameter surface casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist

A circular professional seal for David L. Hoffman, P.G., No. 21064, State of Florida. The seal is partially obscured by the signature and the text "Hydrogeologist".



Copy via electronic mail only:

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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Geophysical logs
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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November 30, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 3) – Well IW-2
November 20 through November 27, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from November 20, 2009 at 0700 hours through November 27 at 0700 hours. Youngquist Brothers Inc installed and cemented the 52-inch conductor casing to a depth of 155 feet bpl on November 20, 2009. A temperature log was also completed after cementing of the casing on November 20, 2009. No other construction was performed on IW-2 in this report period. A weekly construction summary is attached to this letter along with daily logs, geophysical logs, and pad well monitoring data. I will mail paper copies of the geophysical logs to your office and the FDEP Tallahassee office.

Activities scheduled for next week include the reaming of a 50.5-inch borehole to an anticipated depth of 1,100 feet bpl and setting of a 42-inch diameter surface casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. L. Hoffman', is written over a faint circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

Cathy McCarty, P.G., (FDEP – Tallahassee): cathleen.mccarty@dep.state.fl.us

Steve Anderson, P.G., (SFWMD): sanderso@sfwmd.gov

Carlos Espinosa, P.E., (DERM Director): EspinC@miamidade.gov

Ron Armstrong, P.E., (Parsons): Ron.Armstrong@parsons.com

William Pitt, P.E., (Miami-Dade Water and Sewer Dept): WPITT@miamidade.gov

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Jenny Jean-Pierre (Miami-Dade Water and Sewer Dept): JJEANP@miamidade.gov

Leo Cannyn, PMP, P.E., (R.W. Beck, Inc.): lcannyn@rwbeck.com

Chris Bannon, (Youngquist Brothers, Inc.): Chrisb@youngquistbrothers.com

Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Geophysical logs
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 4, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 4) – Well IW-2
November 27 through December 4, 2009
FDEP File No. 0289249-001-UC


Dear Gardner:


Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from November 27, 2009 at 0700 hours through December 4, 2009 at 0700 hours. The drill rig was inactive on November 27, 2009 and rig maintenance was performed on November 28, 2009. Youngquist Brothers, Inc. started drilling a 50.5-inch borehole on November 29, 2009 and drilled to 729 feet bpl at the end of this report period.

Activities scheduled for next week include the completion of the 50.5-inch borehole to approximately 1100 feet bpl, geophysical logging of the completed borehole, installation of the 42-inch (0.375-inch wall steel) surface casing to approximately 1100 feet bpl, and conversion of the drill rig to reverse air.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist





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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Linda Gundel, P.E. (Parsons Water and Infrastructure, Inc.) Linda.Gundel@parsons.com

Leo Cannyn, PMP, P.E., (R.W. Beck, Inc.): lcannyn@rwbeck.com

Chris Bannon, (Youngquist Brothers, Inc.): Chrisb@youngquistbrothers.com

Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Geophysical logs
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 14, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 5) – Well IW-2
December 4, 2009 through December 11, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from December 4, 2009 at 0700 hours through December 11, 2009 at 0700 hours. Drilling of the 50.5-inch borehole continued this week from a depth of 742 feet bpl to a total depth of 1082 feet bpl on December 10, 2009.

Activities scheduled for next week include the geophysical logging of the 50.5-inch borehole, installation and cementing of the 42-inch (0.375-inch steel wall) surface casing, conversion of the drill rig to reverse air, and drilling of a 12.25-inch pilot hole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Chris Bannon, (Youngquist Brothers, Inc.): Chrisb@youngquistbrothers.com

Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Lithologic log
- 5) Pad monitoring well data




VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 6) – Well IW-2
December 11, 2009 through December 18, 2009
FDEP File No. 0289249-001-UC


Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from December 11, 2009 at 0700 hours through December 18, 2009 at 0700 hours. Youngquist Brothers, Inc. installed the 42-inch diameter surface casing to a depth of 1,075 feet bpl. The drill rig was converted to reverse air and a 12.25-inch diameter pilot hole was completed to a depth of 1,621 feet bpl at the end of this report period.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Lithologic log
- 5) Geophysical log
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



December 28, 2009

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 7) – Well IW-2
December 18, 2009 through December 25, 2009
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from December 18, 2009 at 0700 hours through December 25, 2009 at 0700 hours. Youngquist Brothers, Inc. completed the construction and geophysical logging of a 12.25-inch diameter pilot hole to a depth of 1,940 feet below pad level (bpl). This pilot hole was completed to identify the base of the USDW and seating depth of a 34-inch diameter intermediate casing. Copies of the geophysical logs and borehole televiwer data were delivered to your office and the office of Mr. George Heuler on December 22, 2009. Electronic copies of the geophysical logs are also attached to the email that accompanies this letter. A straddle packer test was performed on an interval between 1,883.5 and 1,901 feet bpl on December 21, 2009, which is below the base of the USDW. The 12.25-inch pilot hole was plugged with cement on December 21st and 22nd. No drilling or testing was performed between December 23rd and December 25th.

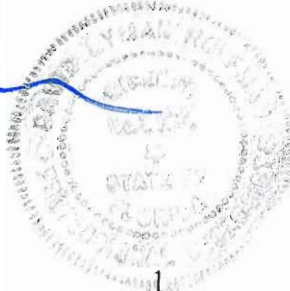
Activities scheduled for next week include obtaining approval from the FDEP to seat the 34-inch diameter intermediate casing to a depth of 1,900 feet bpl and reaming to a 40.5-inch diameter borehole to approximately 1,900 feet bpl.

Please do not hesitate to contact me should you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Lithologic log
- 5) Geophysical logs (as .zip file)
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 4, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 8) – Well IW-2
December 25, 2009 through January 1, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from December 25, 2009 at 0700 hours through January 1, 2010 at 0700 hours. The rig was shut down on December 25, 2009. Rig maintenance and preparation for reaming to a 40.5-inch diameter borehole was performed between December 26th and 29th. Reaming started on December 30, 2009 and was completed to a depth of 1,205 feet bpl at the end of this report period. Permission to seat the 34-inch diameter intermediate casing at a depth of 1,900 feet bpl was received from your office on December 30, 2009.

Activities scheduled for next week include reaming a 40.5-inch diameter borehole and installation of the 34-inch diameter intermediate casing to a depth of 1,900 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, followed by a circular official seal of the Florida Department of Environmental Protection. The seal contains the text "FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION" and "OFFICIAL SEAL".

David L. Hoffman, P.G.
Hydrogeologist

Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Lithologic log
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 8, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 9) – Well IW-2
January 1, 2010 through January 8, 2010
FDEP File No. 0289249-001-UC


Dear Gardner:


Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from January 1, 2010 at 0700 hours through January 8, 2010 at 0700 hours. The pilot hole was reamed to a 40.5-inch diameter borehole to 1,905 feet bpl in the report period.

Activities scheduled for next week include the installation of a 34-inch diameter intermediate casing to a depth of 1,900 feet bpl. Approval from your office to seat the intermediate casing at 1,900 feet bpl was received on December 30, 2009.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist

A circular official seal of the Florida Department of Environmental Protection, featuring the state seal of Florida in the center and the text "FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION" around the perimeter.

Copy via electronic mail only:

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey summary
- 4) Lithologic log
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 15, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 10) – Well IW-2
January 8, 2010 through January 15, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. (SWS) is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from January 8, 2010 at 0700 hours through January 15, 2010 at 0700 hours. The drill rig was inactive from January 8th through January 10th. Caliper and gamma ray logs were performed on the 40.5-inch diameter borehole on January 11, 2010 in preparation for seating the 34-inch diameter intermediate casing at a depth of 1,900 feet bpl. The 34-inch diameter casing was lowered into borehole on January 12, 2010 and cemented in place via four cement stages on January 12th through January 15, 2010.

Activities scheduled for next week include the continued cementing of the 34-inch diameter intermediate casing, drilling of a 12.25-inch pilot hole, and collection of core samples.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. L. Hoffman', written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical logs (caliper and gamma ray: 40.5-inch borehole)
- 4) Lithologic log
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



January 22, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 11) – Well IW-2
January 15, 2010 through January 22, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from January 15, 2010 at 0700 hours through January 22, 2010 at 0700 hours. Youngquist completed the cementing of the 34-inch diameter intermediate casing via 6 stages. A temperature log was completed after each cement stage. The following three cores were obtained during the report period: Core No. 1 (1952-1968 feet bpl), Core No. 2 (2050-2065 feet bpl), and Core No. 3 (2100-2109 feet bpl). A 12.25-inch diameter pilot hole was completed below the base of the 34-inch diameter intermediate casing and between each of the core intervals.

Activities scheduled for next week include the continued drilling of a 12.25-inch pilot hole and collection of cores.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", is written over a circular official seal. The seal is embossed and contains the text "FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION" around the perimeter and "SIGNAL CENTER" at the bottom. The signature is written in a fluid, cursive style.

David L. Hoffman, P.G.
Hydrogeologist

Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination Survey
- 4) Geophysical log (cement temperature log)
- 5) Lithologic log
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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January 29, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 12) – Well IW-2
January 22, 2010 through January 29, 2010
FDEP File No. 0289249-001-UC


Dear Gardner:

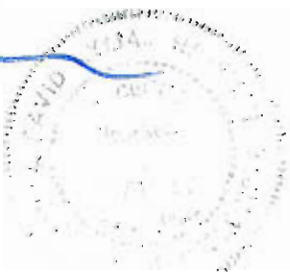
Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from January 22, 2010 at 0700 hours through January 29, 2010 at 0700 hours. Youngquist completed a 12.25-inch diameter pilot hole from 2,420 to 3,090 feet bpl during the report period. Core number 4 (2,432-2439.6 feet bpl) and core number 5 (2,775-2786 feet bpl) were also completed during the report period.

Activities scheduled for next week include completion of the 12.25-inch diameter pilot hole to a total depth of 3,500 feet bpl, geophysical logging (static and dynamic) of the entire pilot hole from the base of the intermediate casing at 1,900 feet bpl to a total depth of 3,500 feet bpl, and packer testing of selected intervals.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
Cathy McCarty, P.G., (FDEP – Tallahassee): cathleen.mccarty@dep.state.fl.us
Steve Anderson, P.G., (SFWMD): sanderso@sfwmd.gov
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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination Survey
- 4) Lithologic log
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
Tel. 1 239 481 6494
Fax 1 239 481 6393



February 5, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 13) – Well IW-2
January 29, 2010 through February 5, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from January 29, 2010 at 0700 hours through February 5, 2010 at 0700 hours. Youngquist completed a 12.25-inch diameter pilot hole from 3,090 to 3,364 feet bpl during the report period.

Activities scheduled for next week include completion of the 12.25-inch diameter pilot hole to a total depth of 3,500 feet bpl, geophysical logging (static and dynamic) of the entire pilot hole from the base of the intermediate casing at 1,900 feet bpl to a total depth of 3,500 feet bpl, and packer testing of selected intervals.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "DLH", is written over a faint circular official seal.

David L. Hoffman, P.G.
Hydrogeologist

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

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February 12, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 14) – Well IW-2
February 5, 2010 through February 12, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from February 5, 2010 at 0700 hours through February 12, 2010 at 0700 hours. The 12.25-inch diameter pilot hole was completed to a total depth of 3,500 feet bpl on February 6, 2010. Geophysical logs and borehole televiewer were run on February 7, 2010. Paper copies of these geophysical logs and a DVD of the borehole televiewer data were delivered to your and Mr. Heuler's office on February 10, 2010. Packer test no. 2 (2,049-2,066.5 feet bpl), packer test no. 3B (2,724-2,741.5 feet bpl), and packer test no. 4 (2,259-2,276.5 feet bpl) were completed between February 8, 2010 and February 11, 2010. A cement bridge plug was set at an approximate depth of 3,028 feet bpl this morning.

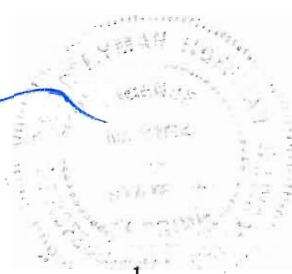
Activities scheduled for next week include the cement backplugging of the 12.25-inch pilot hole from an approximate depth of 3,028 feet bpl up to the base of the intermediate casing at 1,900 feet bpl. The borehole will then be reamed using a 32.5-inch diameter bit to a depth of 2,980 feet. A request to seat the 24-inch diameter injection casing at 2,980 feet bpl was submitted to your office yesterday.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', written over a circular official stamp.

David L. Hoffman, P.G.
Hydrogeologist





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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
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- 4) Lithologic log
- 5) Geophysical logs
- 6) Pad monitoring well data

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February 19, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 15) – Well IW-2
February 12, 2010 through February 19, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from February 12, 2010 at 0700 hours through February 19, 2010 at 0700 hours. The 12.25-inch diameter pilot hole was backplugged with cement between 3,010 and 1,889 feet bpl via 13 stages. A 32.5-inch diameter borehole was reamed from 1,889 to 2,297 feet bpl during the report period.

Activities scheduled for next week include continued reaming of a 32.5-inch borehole to approximately 2,970 feet bpl followed by reaming of a 22-inch borehole to 3,500 feet bpl. A request to seat the 24-inch diameter injection casing at a depth of 2,980 feet bpl was submitted to your office on February 11, 2009.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman', is written over a circular official seal. The seal is faint and contains text around its perimeter, including 'FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION' and 'SOUTHEAST DISTRICT'.

David L. Hoffman, P.G.
Hydrogeologist

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ATTACHMENTS

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- 2) Daily logs
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- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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Fax 1 239 481 6393



February 26, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 16) – Well IW-2
February 19, 2010 through February 26, 2010
FDEP File No. 0289249-001-UC


Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from February 19, 2010 at 0700 hours through February 26, 2010 at 0700 hours. A 32.5-inch diameter borehole was reamed between 2,297 to 2,662 feet bpl.

Activities scheduled for next week include continued reaming of a 32.5-inch borehole to approximately 2,970 feet bpl followed by reaming of a 22-inch borehole to 3,500 feet bpl.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,


David L. Hoffman, P.G.
Hydrogeologist



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March 5, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 17) – Well IW-2
February 26, 2010 through March 5, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from February 26, 2010 at 0700 hours through March 5, 2010 at 0700 hours. A 32.5-inch diameter borehole was reamed from 2,662 to 2,970 feet bpl during the report period. The 32.5-inch diameter borehole was stepped down to a 22.5-inch diameter borehole between a depth of 2,970 and 2,974 feet bpl. A 22.5-inch diameter borehole was then completed to a depth of 3,121 feet bpl at the end of the report period.

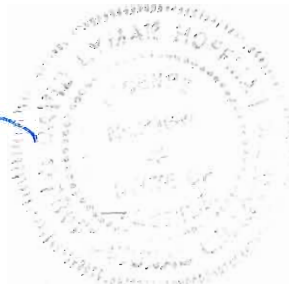
Activities scheduled for next week include continued reaming of a 22.5-inch borehole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a circular official stamp.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us
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- 2) Daily logs
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- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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Fax 1 239 481 6393



March 12, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 18) – Well IW-2
March 5, 2010 through March 12, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from March 5, 2010 at 0700 hours through March 12, 2010 at 0700 hours. A 22.5-inch diameter borehole was reamed from 3,121 to 3,304 feet bpl during the report period.

Activities scheduled for next week include continued reaming of the 22.5-inch diameter borehole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "DLH", written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist





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ATTACHMENTS

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March 19, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 19) – Well IW-2
March 12, 2010 through March 19, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from March 12, 2010 at 0700 hours through March 19, 2010 at 0700 hours. A 22.5-inch diameter borehole was reamed from 3,304 feet bpl to a total depth of 3,505 feet bpl during the report period.

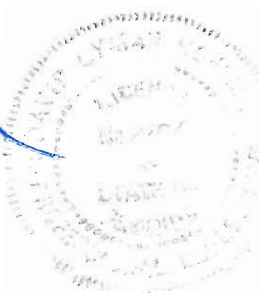
Activities scheduled for next week include geophysical logging of the reamed borehole and installation of the 24-inch diameter injection casing. Your office approved an injection casing seat of 2,980 feet bpl in IW-2 on February 16, 2010.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a circular official seal.

David L. Hoffman, P.G.
Hydrogeologist



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ATTACHMENTS

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- 2) Daily logs
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March 26, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 20) – Well IW-2
March 19, 2010 through March 26, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from March 19, 2010 at 0700 hours through March 26, 2010 at 0700 hours. Geophysical logging (caliper and gamma ray) of the 32-inch diameter borehole was performed in preparation for installation of the 24-inch diameter injection casing. The 24-inch diameter injection casing was lowered on March 20-21 and March 24th to a depth of 2,975 feet bpl. Rig maintenance was performed on March 22nd and 23rd. The base of the casing was cemented in place on March 25, 2010.

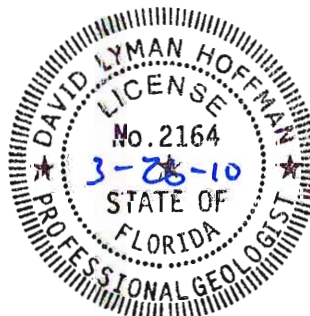
Activities scheduled for next week include cementing of the 24-inch diameter injection casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. L. Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



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Fax 1 239 481 6393



April 2, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 21) – Well IW-2
March 26, 2010 through April 2, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from March 26, 2010 at 0700 hours through April 2, 2010 at 0700 hours. Cementing of the 24-inch diameter injection casing was completed to within 300 feet of the land surface via 15 stages between March 26, 2010 and April 1, 2010. A cement bond log was run and final cement stage (no. 16) were completed on April 1, 2010.

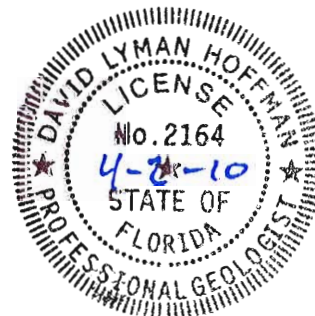
Activities scheduled for next week include pressure testing of the 24-inch diameter injection casing on April 5, 2010 and installation of the fiberglass tubing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Cement stage summary
- 4) Geophysical Log (Cement Top Temp Log)
- 5) Geophysical Log (Cement Bond Log)
- 6) Pad monitoring well data

1567 Hayley Lane, Suite 202
Fort Myers, FL 33907
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April 9, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 22) – Well IW-2
April 2, 2010 through April 9, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from April 2, 2010 at 0700 hours through April 9, 2010 at 0700 hours. Work during the report was limited to a cement temperature log of the 24-inch diameter injection casing, pressure test of the 24-inch diameter injection casing, and installation of the fiberglass tubing.

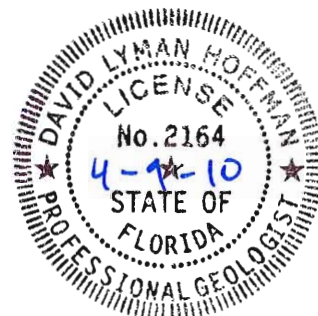
Work scheduled for next week includes the collection of samples for primary and secondary drinking water parameters.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist





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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) 24-inch diameter injection casing pressure test results
- 4) Geophysical Log (Cement Top Temp Log)
- 5) Pad monitoring well data

1567 Hayley Lane, Suite 202
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April 16, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Class I Injection Wells IW-1 & IW-2
Weekly Construction Report (Week 23) – Well IW-2
April 9, 2010 through April 16, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP Class I Injection Well IW-2. This report covers the period from April 9, 2010 at 0700 hours through April 16, 2010 at 0700 hours. Work on IW-2 was substantially finished during this report period. Work was limited to development of the well, sampling for primary and secondary drinking water standards, and video logging of the well.

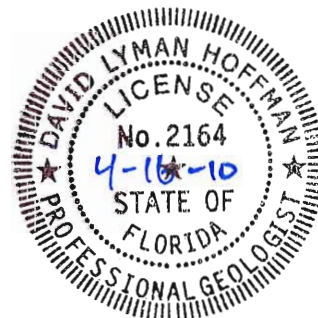
This will be the last weekly progress report for IW-2.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read 'DLH', with a stylized flourish at the end.

David L. Hoffman, P.G.
Hydrogeologist





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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Pad monitoring well data

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May 14, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 27)
May 7, 2010 through May 14, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 7, 2010 at 0700 hours through May 14, 2010, 2010 at 0700 hours. The following sections provide a summary of work completed during the report period and work that will be performed in the next week.

DZMW-1

During the report period, the upper and lower zones of the monitoring well were developed and sampled for primary and secondary drinking water standards on May 10, 2010. Work on DZMW-1 is complete.

IW-1

During the report period, the annulus of IW-1 was pressure tested on May 13, 2010. A 24-hour background period will start on May 16, 2010 at approximately 0700 hours, followed by a 12-hour injection test on May 17, 2010, which will then be followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, gamma ray log, and radioactive tracer test will be run on May 18, 2010 and May 19, 2010.

IW-2

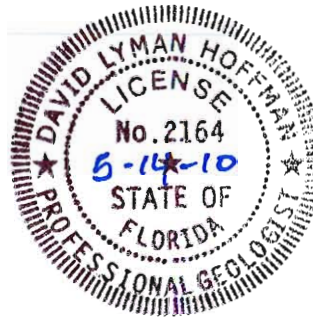
During the report period, a 24-hour background monitoring phase prior to the injection test was completed on May 10, 2010, followed an injection test May 11, 2010 and a 24-hour recovery phase on May 12, 2010. Temperature and gamma ray logging along with a radioactive tracer test was performed on May 13, 2010. All work on IW-2 is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1 and IW-2
- 2) Daily logs for IW-1 and IW-2
- 3) IW-1 annulus pressure test summary
- 4) Pad monitoring well data (IW-1 and IW-2)

DZMW-1

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March 26, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 20) – DZMW-1
March 19, 2010 through March 26, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from March 19, 2010 at 0700 hours through March 26, 2010 at 0700 hours. Preparations for drilling of DZMW-1 began this week with the moving of the drill rig from IW-1 to DZMW-1.

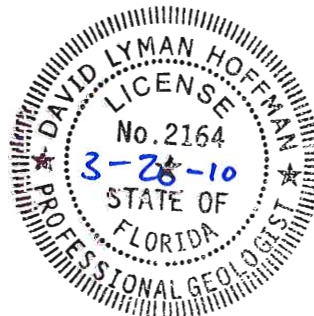
Work scheduled for next week includes the drilling of a 40.5-inch diameter borehole and installation of a 30-inch diameter conductor casing. Other work may include the drilling of a 28-inch diameter borehole and installation of a 20-inch diameter surface casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. L. Hoffman", written over a light blue background.

David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Pad monitoring well data

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April 2, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 21) – DZMW-1
March 26, 2010 through April 2, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from March 26, 2010 at 0700 hours through April 2, 2010 at 0700 hours. Drilling of DZMW-1 began on March 26, 2010. A 40.5-inch diameter borehole was completed to 161 feet bpl and geophysical logging was performed prior to pressure grouting of a 30-inch diameter casing on March 28, 2010. A 28.5-inch diameter borehole was then drilled to a depth of 780 feet bpl at the end of this report period.

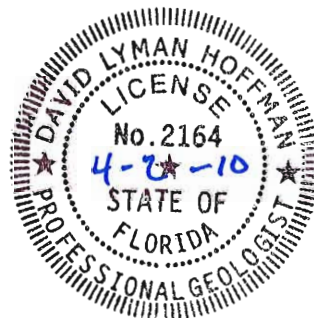
Work scheduled for next week includes the continued drilling of a 28.5-inch diameter borehole to an approximate depth of 1,000 feet bpl, cementing of a 20-inch diameter surface casing to an approximate depth of 1,000 feet bpl, and conversion of the drill rig to reverse air.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log (Caliper and Gamma Ray)
- 4) Geophysical log (Cement Top Temp Log)
- 5) Inclination Survey
- 6) Lithologic Log
- 7) Pad monitoring well data

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April 9, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 22) – DZMW-1
April 2, 2010 through April 9, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 2, 2010 at 0700 hours through April 9, 2010 at 0700 hours. A 28.5-inch diameter borehole was drilled between 780 feet bpl and 1,079 feet bpl during the report period. A 20-inch diameter surface casing was pressure grouted in the 28.5-inch borehole via one stage on April 7, 2010 at a depth of 1,075 feet bpl.

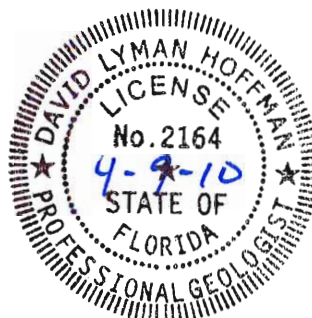
Work scheduled for next week includes the drilling of a 12.25-inch pilot hole to 1,915 feet bpl, geophysical logging, and packer testing of the interval between 1,875 and 1,915 feet bpl. A request for monitor casing (12.75-inch) seat and upper monitor zone will likely be submitted to your office next week. The 12.25-inch diameter pilot hole will be reamed to a 20-inch borehole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log (Caliper and Gamma Ray)
- 4) Geophysical log (Cement Top Temp Log)
- 5) Geophysical log (Dual Induction)
- 6) Inclination Survey
- 7) Lithologic Log
- 8) Pad monitoring well data

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April 16, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 23) – DZMW-1
April 9, 2010 through April 16, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 9, 2010 at 0700 hours through April 16, 2010 at 0700 hours. A 12.25-inch diameter pilot hole was drilled between 1,212 and 1,940 feet bpl between April 9, 2010 and April 10, 2010. Geophysical logging of the 12.25-inch pilot hole was performed on April 11, 2010. An off bottom packer test was performed on the 1,900 to 1,940 feet bpl interval on April 12, 2010. The proposed upper monitor zone was filled with gravel on April 13, 2010. Approval to seat the monitor casing at a depth of 1,900 feet bpl along with an upper monitoring zone of 1,900 to 1,940 feet bpl was given by your office on April 15, 2010. Reaming to an 18.5-inch borehole was completed from 1,079 to 1,900 feet bpl between April 13, 2010 and April 16, 2010.

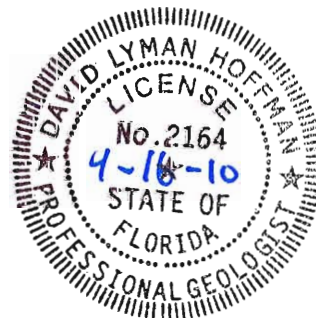
Work scheduled for next week includes running of caliper and gamma ray logs on the 18.5-inch diameter borehole, installation of the 12.75-inch monitor casing to 1,900 feet bpl, pressure test of the 12.75-inch diameter monitor casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. L. Hoffman".

David L. Hoffman, P.G.
Hydrogeologist





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ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log 12.25-inch diameter pilot hole (Caliper and Gamma Ray)
- 4) Geophysical log 12.25-inch diameter pilot hole (Dual Induction)
- 5) Geophysical log 12.25-inch diameter pilot hole (Sonic)
- 6) Geophysical log 12.25-inch diameter pilot hole (Conductivity & Temp)
- 7) Geophysical log 12.25-inch diameter pilot hole (Flowmeter)
- 8) Inclination Survey 12.25-inch diameter pilot hole
- 9) Inclination Survey 18.5-inch diameter ream
- 10) Lithologic Log
- 11) Pad monitoring well data

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April 23, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 24) – DZMW-1
April 16, 2010 through April 23, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 16, 2010 at 0700 hours through April 23, 2010 at 0700 hours. The 18.5-inch diameter borehole was completed to a depth of 1,900 feet bpl on April 16, 2010 in preparation for installation of 12.75-inch diameter monitor casing. Caliper and gamma ray logs were completed on the 18.5-inch diameter casing on April 16, 2010. The 12.75-inch diameter monitor casing was installed on April 17, 2010 to a depth of 1,900 feet bpl. The 12.75-inch diameter monitor casing was cemented in place via 5 stages between April 18 and 20th. Temperature logs were run after each cement stage. An 11-inch diameter borehole was completed to 2,099 feet bpl at the end of the report period.

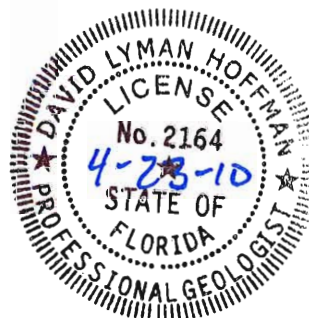
Work scheduled for next week includes completion of the 11-inch borehole to a depth of 2,260 feet bpl in preparation for the proposed lower monitoring zone testing. Geophysical logging will be performed followed by an off bottom packer test. Geophysical logs and packer test data will be forwarded to the FDEP. A pressure test of the 12.75-inch diameter monitor casing is scheduled for April 27, 2010 at 9 am.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman".

David L. Hoffman, P.G.
Hydrogeologist





Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log 18.5-inch diameter borehole (Caliper and Gamma Ray)
- 4) Geophysical log 12.75-inch diameter monitor casing (Cement Top Logs)
- 5) Inclination Survey 11-inch diameter pilot
- 6) Lithologic Log
- 7) Pad monitoring well data (IW-1 and IW-2)

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May 3, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 25) – DZMW-1
April 23, 2010 through April 30, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 23, 2010 at 0700 hours through April 30, 2010 at 0700 hours. The 11-inch diameter borehole was drilled to a total depth of 2,260 feet bpl on April 23, 2010. Geophysical logs of the interval from 1,900 to 2,260 feet bpl were run on April 24, 2010. Paper copies of these logs were delivered to your office and pdf copies are attached to this email. A single off-bottom packer (No. 2) was run on the interval of 2,210 to 2260 feet bpl on April 25th and 26th. A pressure test of the 12.75-inch diameter monitor casing was completed on April 27, 2010. A submittal for a lower monitoring zone was submitted to your office on April 27, 2010. No work was performed on April 28th and 29th.

Work scheduled for next week includes running a cement bond log, pressure test of the 6.625-inch inner casing (scheduled for May 5, 2010 at 9 am), development of the upper and lower monitoring zones, collection of samples from the upper and lower monitoring zones for primary and secondary drinking water standards, installation of the wellhead, installation of pressure transducers, and video logging.

The following is an update on the injection wells as you requested:

IW-1

Work scheduled for next week may include digging up of the well from below grade, building up of the well to specified elevation, outfitting with flanges, and tap as specified. Please note that the injection test is tentatively scheduled for May 10, 2010.

IW-2

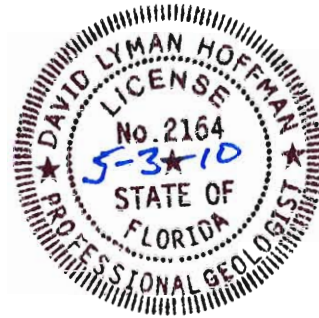
Work scheduled for next week includes a pressure test of the annulus on May 5, 2010 at 9 am. The injection test is tentatively scheduled for May 10, 2010.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey 11-inch diameter borehole
- 4) Lithologic log 0 to 2260 ft bpl
- 5) Geophysical log caliper gamma ray 11-inch borehole
- 6) Geophysical log dual induction 11-inch borehole
- 7) Geophysical log flow meter 11-inch borehole
- 8) Geophysical log sonic 11-inch borehole
- 9) Packer test 2 data
- 10) Pad monitoring well data (IW-1 and IW-2)

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May 7, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 26) – DZMW-1
April 30, 2010 through May 7, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 30, 2010 at 0700 hours through May 7, 2010, 2010 at 0700 hours. The installation and cementing of the 6.625-inch diameter fiberglass inner casing was completed between April 30, 2010 and May 3, 2010. Copies of the cement top temperature logs and cement bond logs are attached to this email. A downhole television survey of DZMW-1 was performed on May 4, 2010. A pressure test of the 6.625-inch inner casing was completed on May 5, 2010. A copy of the casing pressure test results is attached to this email.

Work scheduled for next week include development of the upper and lower monitoring zones and sampling for laboratory analyses of primary and secondary drinking water standards.

IW-1

Work scheduled for next week may include pressure testing of the annulus and downhole video survey of the well.

IW-2

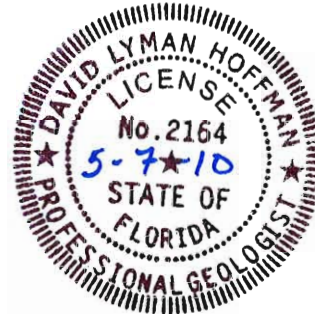
A 24-hour background monitoring phase prior to the injection test will be completed on Monday (5/10), followed an injection test on IW-2 on Tuesday (5/11) and a 24-hour recovery phase on Wednesday (5/12). A radioactive tracer test will is scheduled for Thursday (5/13).

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log cement top temperature log 6.625-inch inner casing
- 4) Geophysical log cement bond log 6.625-inch inner casing
- 5) Pressure test summary 6.625-inch inner casing
- 6) Pad monitoring well data (IW-1 and IW-2)

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May 14, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 27)
May 7, 2010 through May 14, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 7, 2010 at 0700 hours through May 14, 2010, 2010 at 0700 hours. The following sections provide a summary of work completed during the report period and work that will be performed in the next week.

DZMW-1

During the report period, the upper and lower zones of the monitoring well were developed and sampled for primary and secondary drinking water standards on May 10, 2010. Work on DZMW-1 is complete.

IW-1

During the report period, the annulus of IW-1 was pressure tested on May 13, 2010. A 24-hour background period will start on May 16, 2010 at approximately 0700 hours, followed by a 12-hour injection test on May 17, 2010, which will then be followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, gamma ray log, and radioactive tracer test will be run on May 18, 2010 and May 19, 2010.

IW-2

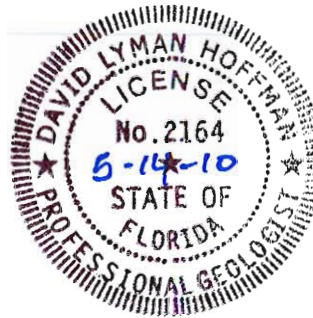
During the report period, a 24-hour background monitoring phase prior to the injection test was completed on May 10, 2010, followed an injection test May 11, 2010 and a 24-hour recovery phase on May 12, 2010. Temperature and gamma ray logging along with a radioactive tracer test was performed on May 13, 2010. All work on IW-2 is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1 and IW-2
- 2) Daily logs for IW-1 and IW-2
- 3) IW-1 annulus pressure test summary
- 4) Pad monitoring well data (IW-1 and IW-2)

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May 21, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 28)
May 14, 2010 through May 21, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 14, 2010 at 0700 hours through May 21, 2010 at 0700 hours. As per your request, this is the last weekly construction report. Future reports will be submitted every other week and will only be sent to your attention. The following sections provide a summary of work completed during the report period and work that will be completed within the next two weeks.

DZMW-1

A submersible pump will be installed in the lower monitoring zone during the next two weeks.

IW-1

During the report period a 24-hour background monitoring phase prior to the injection test was completed on May 16, 2010, followed by a 12-hour injection test on May 17, 2010, which was then followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, and gamma ray log were also completed on May 18, 2010. A radioactive tracer test was completed on May 19, 2010. Work on this injection well is complete.

IW-2

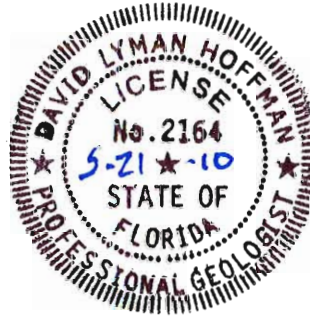
Work on this injection well is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1
- 2) Daily logs for IW-1
- 3) Radioactive Tracer Test log
- 4) Pad monitoring well data (IW-1 and IW-2)

1567 Hayley Lane, Suite 202
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June 18, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP IW-1, IW-2 and DZMW-1
Monthly Construction Report
May 21, 2010 through June 18, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following monthly summary report. This combined report covers the period from May 21, 2010 through June 18, 2010. Youngquist Brothers, Inc. demobilized from the project site on May 29, 2010. No injection well or dual-zone monitor well related work was performed during this report period. The pad monitor wells were sampled on May 21, 2010, May 28, 2010, and June 4, 2010. Results from these sample events are attached.

Please do not hesitate to contact me should you have any question regarding this project.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman'.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us
Linda Gundel, P.E. (Parsons Water and Infrastructure, Inc.) Linda.Gundel@parsons.com
Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

Pad monitoring well data 5/21/10, 5/28/10, and 6/4/10

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April 2, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 21) – DZMW-1
March 26, 2010 through April 2, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from March 26, 2010 at 0700 hours through April 2, 2010 at 0700 hours. Drilling of DZMW-1 began on March 26, 2010. A 40.5-inch diameter borehole was completed to 161 feet bpl and geophysical logging was performed prior to pressure grouting of a 30-inch diameter casing on March 28, 2010. A 28.5-inch diameter borehole was then drilled to a depth of 780 feet bpl at the end of this report period.

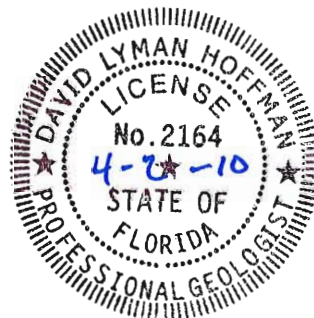
Work scheduled for next week includes the continued drilling of a 28.5-inch diameter borehole to an approximate depth of 1,000 feet bpl, cementing of a 20-inch diameter surface casing to an approximate depth of 1,000 feet bpl, and conversion of the drill rig to reverse air.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a light blue horizontal line.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Chris Bannon, (Youngquist Brothers, Inc.): Chrisb@youngquistbrothers.com

Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log (Caliper and Gamma Ray)
- 4) Geophysical log (Cement Top Temp Log)
- 5) Inclination Survey
- 6) Lithologic Log
- 7) Pad monitoring well data

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Fort Myers, FL 33907
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April 9, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 22) – DZMW-1
April 2, 2010 through April 9, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 2, 2010 at 0700 hours through April 9, 2010 at 0700 hours. A 28.5-inch diameter borehole was drilled between 780 feet bpl and 1,079 feet bpl during the report period. A 20-inch diameter surface casing was pressure grouted in the 28.5-inch borehole via one stage on April 7, 2010 at a depth of 1,075 feet bpl.

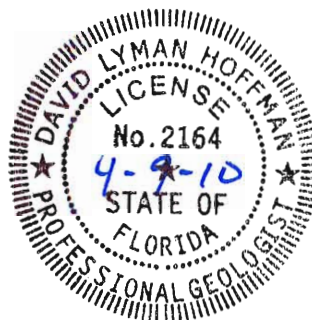
Work scheduled for next week includes the drilling of a 12.25-inch pilot hole to 1,915 feet bpl, geophysical logging, and packer testing of the interval between 1,875 and 1,915 feet bpl. A request for monitor casing (12.75-inch) seat and upper monitor zone will likely be submitted to your office next week. The 12.25-inch diameter pilot hole will be reamed to a 20-inch borehole.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman", written over a circular stamp.

David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log (Caliper and Gamma Ray)
- 4) Geophysical log (Cement Top Temp Log)
- 5) Geophysical log (Dual Induction)
- 6) Inclination Survey
- 7) Lithologic Log
- 8) Pad monitoring well data

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Fort Myers, FL 33907
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April 16, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 23) – DZMW-1
April 9, 2010 through April 16, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 9, 2010 at 0700 hours through April 16, 2010 at 0700 hours. A 12.25-inch diameter pilot hole was drilled between 1,212 and 1,940 feet bpl between April 9, 2010 and April 10, 2010. Geophysical logging of the 12.25-inch pilot hole was performed on April 11, 2010. An off bottom packer test was performed on the 1,900 to 1,940 feet bpl interval on April 12, 2010. The proposed upper monitor zone was filled with gravel on April 13, 2010. Approval to seat the monitor casing at a depth of 1,900 feet bpl along with an upper monitoring zone of 1,900 to 1,940 feet bpl was given by your office on April 15, 2010. Reaming to an 18.5-inch borehole was completed from 1,079 to 1,900 feet bpl between April 13, 2010 and April 16, 2010.

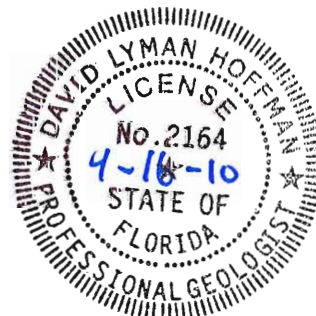
Work scheduled for next week includes running of caliper and gamma ray logs on the 18.5-inch diameter borehole, installation of the 12.75-inch monitor casing to 1,900 feet bpl, pressure test of the 12.75-inch diameter monitor casing.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D. L. Hoffman".

David L. Hoffman, P.G.
Hydrogeologist





Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Carlos Espinosa, P.E., (DERM Director): EspinC@miamidade.gov

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Clint Oakley, P.G. (Miami-Dade Water and Sewer Dept): OAKLEC@miamidade.gov

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Linda Gundel, P.E. (Parsons Water and Infrastructure, Inc.) Linda.Gundel@parsons.com

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log 12.25-inch diameter pilot hole (Caliper and Gamma Ray)
- 4) Geophysical log 12.25-inch diameter pilot hole (Dual Induction)
- 5) Geophysical log 12.25-inch diameter pilot hole (Sonic)
- 6) Geophysical log 12.25-inch diameter pilot hole (Conductivity & Temp)
- 7) Geophysical log 12.25-inch diameter pilot hole (Flowmeter)
- 8) Inclination Survey 12.25-inch diameter pilot hole
- 9) Inclination Survey 18.5-inch diameter ream
- 10) Lithologic Log
- 11) Pad monitoring well data

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April 23, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 24) – DZMW-1
April 16, 2010 through April 23, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 16, 2010 at 0700 hours through April 23, 2010 at 0700 hours. The 18.5-inch diameter borehole was completed to a depth of 1,900 feet bpl on April 16, 2010 in preparation for installation of 12.75-inch diameter monitor casing. Caliper and gamma ray logs were completed on the 18.5-inch diameter casing on April 16, 2010. The 12.75-inch diameter monitor casing was installed on April 17, 2010 to a depth of 1,900 feet bpl. The 12.75-inch diameter monitor casing was cemented in place via 5 stages between April 18 and 20th. Temperature logs were run after each cement stage. An 11-inch diameter borehole was completed to 2,099 feet bpl at the end of the report period.

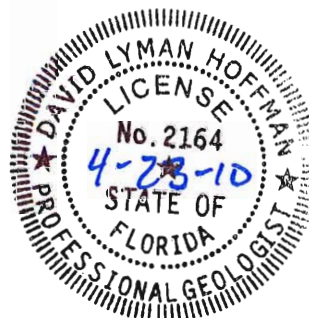
Work scheduled for next week includes completion of the 11-inch borehole to a depth of 2,260 feet bpl in preparation for the proposed lower monitoring zone testing. Geophysical logging will be performed followed by an off bottom packer test. Geophysical logs and packer test data will be forwarded to the FDEP. A pressure test of the 12.75-inch diameter monitor casing is scheduled for April 27, 2010 at 9 am.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,

A handwritten signature in blue ink, appearing to read "D L Hoffman".

David L. Hoffman, P.G.
Hydrogeologist





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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log 18.5-inch diameter borehole (Caliper and Gamma Ray)
- 4) Geophysical log 12.75-inch diameter monitor casing (Cement Top Logs)
- 5) Inclination Survey 11-inch diameter pilot
- 6) Lithologic Log
- 7) Pad monitoring well data (IW-1 and IW-2)

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May 3, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 25) – DZMW-1
April 23, 2010 through April 30, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 23, 2010 at 0700 hours through April 30, 2010 at 0700 hours. The 11-inch diameter borehole was drilled to a total depth of 2,260 feet bpl on April 23, 2010. Geophysical logs of the interval from 1,900 to 2,260 feet bpl were run on April 24, 2010. Paper copies of these logs were delivered to your office and pdf copies are attached to this email. A single off-bottom packer (No. 2) was run on the interval of 2,210 to 2260 feet bpl on April 25th and 26th. A pressure test of the 12.75-inch diameter monitor casing was completed on April 27, 2010. A submittal for a lower monitoring zone was submitted to your office on April 27, 2010. No work was performed on April 28th and 29th.

Work scheduled for next week includes running a cement bond log, pressure test of the 6.625-inch inner casing (scheduled for May 5, 2010 at 9 am), development of the upper and lower monitoring zones, collection of samples from the upper and lower monitoring zones for primary and secondary drinking water standards, installation of the wellhead, installation of pressure transducers, and video logging.

The following is an update on the injection wells as you requested:

IW-1

Work scheduled for next week may include digging up of the well from below grade, building up of the well to specified elevation, outfitting with flanges, and tap as specified. Please note that the injection test is tentatively scheduled for May 10, 2010.

IW-2

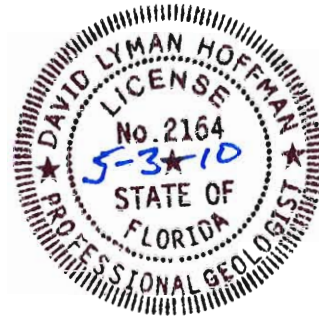
Work scheduled for next week includes a pressure test of the annulus on May 5, 2010 at 9 am. The injection test is tentatively scheduled for May 10, 2010.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Inclination survey 11-inch diameter borehole
- 4) Lithologic log 0 to 2260 ft bpl
- 5) Geophysical log caliper gamma ray 11-inch borehole
- 6) Geophysical log dual induction 11-inch borehole
- 7) Geophysical log flow meter 11-inch borehole
- 8) Geophysical log sonic 11-inch borehole
- 9) Packer test 2 data
- 10) Pad monitoring well data (IW-1 and IW-2)

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May 7, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
Dual-Zone Monitor Well
Weekly Construction Report (Week 26) – DZMW-1
April 30, 2010 through May 7, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following weekly summary report for the City of Hialeah RO WTP dual-zone monitor well DZMW-1. This report covers the period from April 30, 2010 at 0700 hours through May 7, 2010, 2010 at 0700 hours. The installation and cementing of the 6.625-inch diameter fiberglass inner casing was completed between April 30, 2010 and May 3, 2010. Copies of the cement top temperature logs and cement bond logs are attached to this email. A downhole television survey of DZMW-1 was performed on May 4, 2010. A pressure test of the 6.625-inch inner casing was completed on May 5, 2010. A copy of the casing pressure test results is attached to this email.

Work scheduled for next week include development of the upper and lower monitoring zones and sampling for laboratory analyses of primary and secondary drinking water standards.

IW-1

Work scheduled for next week may include pressure testing of the annulus and downhole video survey of the well.

IW-2

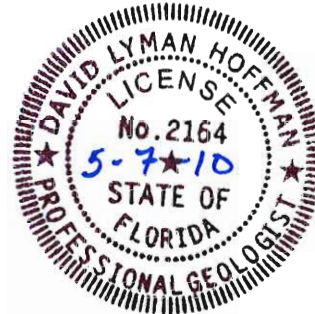
A 24-hour background monitoring phase prior to the injection test will be completed on Monday (5/10), followed an injection test on IW-2 on Tuesday (5/11) and a 24-hour recovery phase on Wednesday (5/12). A radioactive tracer test will is scheduled for Thursday (5/13).

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

Joe May, P.G., (FDEP – West Palm Beach): joseph.may@dep.state.fl.us

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Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summary
- 2) Daily logs
- 3) Geophysical log cement top temperature log 6.625-inch inner casing
- 4) Geophysical log cement bond log 6.625-inch inner casing
- 5) Pressure test summary 6.625-inch inner casing
- 6) Pad monitoring well data (IW-1 and IW-2)

1567 Hayley Lane, Suite 202
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May 14, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 27)
May 7, 2010 through May 14, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 7, 2010 at 0700 hours through May 14, 2010, 2010 at 0700 hours. The following sections provide a summary of work completed during the report period and work that will be performed in the next week.

DZMW-1

During the report period, the upper and lower zones of the monitoring well were developed and sampled for primary and secondary drinking water standards on May 10, 2010. Work on DZMW-1 is complete.

IW-1

During the report period, the annulus of IW-1 was pressure tested on May 13, 2010. A 24-hour background period will start on May 16, 2010 at approximately 0700 hours, followed by a 12-hour injection test on May 17, 2010, which will then be followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, gamma ray log, and radioactive tracer test will be run on May 18, 2010 and May 19, 2010.

IW-2

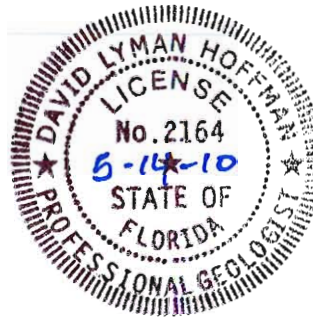
During the report period, a 24-hour background monitoring phase prior to the injection test was completed on May 10, 2010, followed an injection test May 11, 2010 and a 24-hour recovery phase on May 12, 2010. Temperature and gamma ray logging along with a radioactive tracer test was performed on May 13, 2010. All work on IW-2 is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



Copy via electronic mail only:

George Heuler P.G., (FDEP – Tallahassee): George.Heuler@dep.state.fl.us

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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1 and IW-2
- 2) Daily logs for IW-1 and IW-2
- 3) IW-1 annulus pressure test summary
- 4) Pad monitoring well data (IW-1 and IW-2)

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May 21, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP
IW-1, IW-2 and DZMW-1
Combined Weekly Construction Report (Week 28)
May 14, 2010 through May 21, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following combined weekly summary report for the City of Hialeah RO WTP injection wells IW-1 and IW-2 and dual-zone monitor well DZMW-1. This combined report covers the period from May 14, 2010 at 0700 hours through May 21, 2010 at 0700 hours. As per your request, this is the last weekly construction report. Future reports will be submitted every other week and will only be sent to your attention. The following sections provide a summary of work completed during the report period and work that will be completed within the next two weeks.

DZMW-1

A submersible pump will be installed in the lower monitoring zone during the next two weeks.

IW-1

During the report period a 24-hour background monitoring phase prior to the injection test was completed on May 16, 2010, followed by a 12-hour injection test on May 17, 2010, which was then followed by a 24-hour recovery period ending May 18, 2010. Video survey, temperature log, and gamma ray log were also completed on May 18, 2010. A radioactive tracer test was completed on May 19, 2010. Work on this injection well is complete.

IW-2

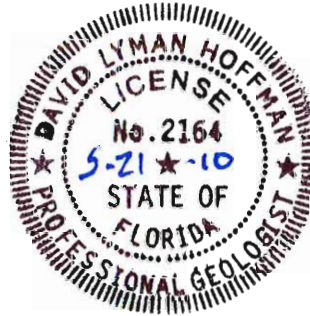
Work on this injection well is complete.

Please do not hesitate to contact me should you have any question concerning the reported well construction and testing activities.

Sincerely,



David L. Hoffman, P.G.
Hydrogeologist



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Brett Youngquist (Youngquist Brothers, Inc.): Brett@youngquistbrothers.com

Wm. Scott Manahan, P.E., (Schlumberger Water Services): SManahan@fort-myers.water.slb.com

ATTACHMENTS

- 1) Weekly construction summaries for IW-1
- 2) Daily logs for IW-1
- 3) Radioactive Tracer Test log
- 4) Pad monitoring well data (IW-1 and IW-2)

1567 Hayley Lane, Suite 202
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June 18, 2010

VIA ELECTRONIC MAIL ONLY: Gardner.Strasser@dep.state.fl.us

J. Gardner Strasser, P.G.
Florida Department of Environmental Protection
Southeast District
Underground Injection Control
Water Facilities Program
400 North Congress Avenue, Suite 200
West Palm Beach, Florida 33401

Subject: City of Hialeah RO WTP IW-1, IW-2 and DZMW-1
Monthly Construction Report
May 21, 2010 through June 18, 2010
FDEP File No. 0289249-001-UC

Dear Gardner:

Schlumberger Water Services USA Inc. is pleased to provide you with the following monthly summary report. This combined report covers the period from May 21, 2010 through June 18, 2010. Youngquist Brothers, Inc. demobilized from the project site on May 29, 2010. No injection well or dual-zone monitor well related work was performed during this report period. The pad monitor wells were sampled on May 21, 2010, May 28, 2010, and June 4, 2010. Results from these sample events are attached.

Please do not hesitate to contact me should you have any question regarding this project.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D L Hoffman'.

David L. Hoffman, P.G.
Hydrogeologist



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ATTACHMENTS

Pad monitoring well data 5/21/10, 5/28/10, and 6/4/10

Appendix C

IW-1

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.:

ENDING DATE:

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/6/09	0915-1530	Jody Abbott	Rig set-up and adjustments, fix mud circulation system
11/7/09	0700-1420	Jody Abbott	Rig set-up and adjustments
11/7/09-11/8/09	1930-0510	David Barnes	Begin drilling of IW-1 using 60.5-inch diameter bit. Drilling completed to 7.4 feet below pad level
11/8/09	1330-1900	Jody Abbot	Continue drilling with 60.5-inch bit to 9 feet below pad level, rig maintenance
11/8/09-11/9/09	1900-0700	Dan Legett	Continue drilling with 60.5-inch bit to 24 feet below pad level, rig maintenance
11/9/09	0700-1900	David Barnes	Continue drilling with 60.5-inch bit to 39.2 feet below pad level
11/9/09-11/10/09	1900-0700	Dan Legett	Continue drilling with 60.5-inch bit to 78 feet below pad level, rig maintenance
11/10/09	0700-1900	David Barnes	Continue drilling with 60.5-inch bit to 90 feet below pad level, rig maintenance, electrical inspection
11/10/09-11/11/09	1900-0700	Dan Legett	Continue drilling with 60.5-inch bit to total depth of 160 feet below pad level, perform routine rig maintenance
11/11/09	0700-1900	David Barnes	Trip out of borehole, perform caliper and gamma ray logs of borehole, weld and lower 52-inch pit casing to 155 feet below pad level
11/11/09-11/12/09	1900-0700	Dan Legett	Cement grout 52-inch pit casing to 155 feet below pad level
11/12/09	0700-1900	David Barnes	Wait for cement grout to cure, rig up bottom hole assembly, connect to shore power, prepare to drill 12.25-inch pilot hole
11/12/09-11/13/09	1900-0700	Dan Legett	Start drilling 12.25-inch pilot hole, cement inside 52-inch casing tagged at 153 feet below pad level, complete pilot hole to 283 feet below pad level

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 2

ENDING DATE: 11/20/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/13/09	Day	SD	Drill 12.25 inch diameter pilot hole from 283 ft bpl to 660 ft bpl
11/13/09	Night	JA	Drill 12.25 inch diameter pilot hole from 660 ft bpl to 890 ft bpl
11/14/09	Day	SD	Drill 12.25 inch diameter pilot hole from 890 ft bpl to 967 ft bpl
11/14/09	Night	JA	Drill 12.25 inch diameter pilot hole from 967 ft bpl to 1100 ft bpl
11/15/09	Day	SD	Clean out hole in preparation for geophysical logging; Run geophysical logs-caliper, SP, gamma ray, and DIL.
11/15/09	Night	JA	Build BHA for 50- inch ream and set up mud system.
11/16/09	Day	SD	Ream nominal 50-inch diameter borehole from 155 ft bpl to 217 ft bpl
11/16/09	Night	JA	Ream nominal 50-inch diameter borehole from 217 ft bpl to 306 ft bpl, conduct inclination survey at 300 ft bpl.
11/17/09	Day	SD	Ream nominal 50-inch diameter borehole from 306 ft bpl to 420 ft bpl, conduct inclination survey at 390 ft bpl.
11/17/09	Night	JA	Ream nominal 50-inch diameter borehole from 420 ft bpl to 486 ft bpl, conduct inclination survey for 480 ft bpl.
11/18/09	Day	SD	Ream nominal 50-inch diameter borehole from 486 ft bpl to 534 ft bpl.
11/18/09	Night	JA	Ream nominal 50-inch diameter borehole from 534 ft bpl to 621 ft bpl, conduct inclination survey for 570 ft bpl.
11/19/09	Day	SD	Ream nominal 50-inch diameter borehole from 621 ft bpl to 711 ft bpl, conduct inclination survey for 660 ft bpl
11/19/09	Night	JA	Ream nominal 50-inch diameter borehole from 711 ft bpl to 791 ft bpl

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 3

ENDING DATE: 11/27/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/20/09	Day	DB	Ream 50.5-inch borehole 800 to 813 ft bpl.
11/20/09	Night	DL	Ream 50.5-inch borehole 813 to 886 ft bpl.
11/21/09	Day	DB	Ream 50.5-inch borehole 886 to 936 ft bpl.
11/21/09	Night	DL	Ream 50.5-inch borehole 936 to 965 ft bpl.
11/22/09	Day	DB	Ream 50.5-inch borehole 965 to 994 ft bpl.
11/22/09	Night	DL	Ream 50.5-inch borehole 994 to 1022 ft bpl.
11/23/09	Day	DB	Ream 50.5-inch borehole 1022 to 1072 ft bpl.
11/23/09	Night	DL	Ream 50.5-inch borehole 1072 to TD of 1079 ft bpl. Conditioned borehole.
11/24/09	Day	DB	Completed 2 trips to TD of 1079 feet bpl with 50.5-inch bit and conditioned borehole.
11/24/09	Night	DL	Completed 1 trip to TD of 1079 feet bpl with 50.5-inch bit and conditioned borehole.
11/25/09	Day	DB	Completed 1 trip to TD of 1079 feet bpl with 50.5-inch bit and conditioned borehole.
11/25/09	Night	DL	Completed 1 trip to TD of 1079 feet bpl with 50.5-inch bit and conditioned borehole.
11/26/09	Day	DB	Tripped out drill pipe and performed geophysical logging.
11/26/09	Night	DL	Preparation for installation of 42-inch casing.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 4

ENDING DATE: 12/04/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/27/09	Day	JA	Weld and lower 1075 feet (of 1075 ft) of 42-inch casing.
11/27/09	Night	RAS	Pressure grouted first cement stage of 42-inch casing.
11/28/09	Day	JA	Ran temperature log.
11/28/09	Night	RAS	Completed second cement stage of 42-inch casing.
11/29/09	Day	JA	Ran temperature log.
11/29/09	Night	RAS	Converted rig to reverse air.
11/30/09	Day	JA	Converted rig to reverse air.
11/30/09	Night	RAS	Converted rig to reverse air.
12/01/09	Day	JA/BP	Converted rig to reverse air, drilled out cement inside 42-inch casing at 1071 feet bpl, drilled 12.25-inch pilot hole from 1075 to 1086 feet bpl.
12/01/09	Night	RAS	Drilled 12.25-inch pilot hole from 1086 to 1331 feet bpl.
12/02/09	Day	BP	Rig repair and maintenance.
12/02/09	Night	RAS	Drilled 12.25-inch pilot hole from 1331 to 1527 feet bpl.
12/03/09	Day	BP	Drilled 12.25-inch pilot hole from 1568 to 1707 feet bpl.
12/03/09	Night	RAS	Drilled 12.25-inch pilot hole from 1707 to 1882 feet bpl.

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PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 5

ENDING DATE: 12/11/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/04/09	Day	BJP	Drill 12.25-inch pilot hole 1998 to 2021 ft bpl.
12/04/09	Night	BDL	Drill 12.25-inch pilot hole 2021 to 2111 ft bpl.
12/05/09	Day	BJP	Drill 12.25-inch pilot hole 2111 to 2156 ft bpl.
12/05/09	Night	BDL	Run geophysical logs on interval 1075 to 2156 ft bpl.
12/06/09	Day	BJP	Continue geophysical logging as above.
12/06/09	Night	BDL	Pump fresh water to clear borehole for video log.
12/07/09	Day	BJP	Complete video log.
12/07/09	Night	BDL	Start Packer Test No 1 (1839 - 1856 ft bpl).
12/08/09	Day	BJP	Continue Packer Test No 1.
12/08/09	Night	BDL	Complete Packer Test No 1. Start Packer Test No 2 (1899 - 1916 ft bpl).
12/08/09	Day	BJP	Continue Packer Test No 2.
12/09/09	Night	BDL	Complete Packer Test No 2. Start Packer Test No. 3 (1973-1991 ft bpl)
12/10/09	Day	BJP	Continue Packer Test No. 3
12/10/09	Night	BDL	Complete Packer Test No 3. Start Packer Test No 4 (2076 - 2111 ft bpl).

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 6

ENDING DATE: 12/18/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/11/09	Day	BJP	Trip out packer, Trip in tremie pipe to cement 12.25-inch diameter pilot hole
12/11/09	Night	RS	Complete stage 1 and 2 of cementing of 12.25-inch diameter pilot hole
12/12/09	Day	BJP	Complete stage 3 of cementing of 12.25-inch diameter pilot hole
12/12/09	Night	RS	Complete final stage of cementing of 12.25-inch diameter pilot hole to 1139 feet bpl
12/13/09	Day	JA	Build bottom hole assembly for 40.5-inch borehole
12/13/09	Night	RS	Rig inactive
12/14/09	Day	JA	Reaming 40.5-inch borehole to 1088 feet bpl
12/14/09	Night	RS	Reaming 40.5-inch borehole to 1136 feet bpl
12/15/09	Day	JA	Reaming 40.5-inch borehole to 1243 feet bpl
12/15/09	Night	RS	Reaming 40.5-inch borehole to 1340 feet bpl
12/16/09	Day	DB	Reaming 40.5-inch borehole to 1436 feet bpl
12/16/09	Night	RS	Reaming 40.5-inch borehole to 1520 feet bpl
12/17/09	Day	DB	Reaming 40.5-inch borehole to 1609 feet bpl
12/17/09	Night	RS	Reaming 40.5-inch borehole to 1658 feet bpl

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 7

ENDING DATE: 12/25/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/18/09	Day	DL	Reaming 40.5-inch diameter borehole 1672 - 1715 ft.
12/18/09	Night	RS	Reaming 40.5-inch diameter borehole 1715 - 1740 ft.
12/19/09	Day	DL	Reaming 40.5-inch diameter borehole 1740 - 1800 ft.
12/19/09	Night	DL	Reaming 40.5-inch diameter borehole 1800 - 1854 ft.
12/20/09	Day	DB	Reaming 40.5-inch diameter borehole 1854 - 1905 ft.
12/20/09	Night	DL	Conditioned 40.5-inch diameter borehole.
12/21/09	Day	DB	No rig activity.
12/21/09	Night	DL	No rig activity.
12/22/09	Day	DB	No rig activity.
12/22/09	Night		No rig activity.
12/23/09	Day		No rig activity.
12/23/09	Night		No rig activity.
12/24/09	Day		No rig activity.
12/24/09	Night		No rig activity.

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 8

ENDING DATE: 01/01/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/25/09	day	None	No rig activity.
12/25/09	night	None	No rig activity.
12/26/09	day	JA	Tripped in 40.5-inch diameter BHA for borehole clean out.
12/26/09	night	RAS	Tripped out 40.5-inch diameter BHA. Conducted gamma ray and caliper logs
12/27/09	day	JA	Installed 34-inch diameter casing.
12/27/09	night	RAS	Installed 34-inch diameter casing to 1,900 ft bpl.
12/28/09	day	JA	Tripped in cement tubing inside casing. Perform cement stage 1.
12/28/09	night	RAS	Conducted temperature log and tagged at 1,580 ft bpl. Performed cement stage 2.
12/29/09	day	JA	Conducted temperature log and tagged at 1,402 ft bpl.
12/29/09	night	RAS	Performed cement stage 3. Conducted temperature log and tagged at 1,206 ft bpl.
12/30/09	day	JA	Performed cement stage 4. Conducted temperature log.
12/30/09	night	RS	Tagged at 1,018. Performed cement stage 5.
12/31/09	day	JA	Conducted temperature log and tagged at 525 ft bpl. Performed cement stage 6.
12/31/09	night	RAS	Conducted temperature log and tripped in 12.25-inch diameter bit.

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 9

ENDING DATE: 01/08/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/01/10	Day	DB	Drilled 12.25-inch diameter pilot hole 1,890 to 1,952 ft bpl.
01/01/10	Night	DL	Drilled 12.25-inch diameter pilot hole 1,952 to 2,112 ft bpl.
01/02/10	Day	DB	Drilled 12.25-inch diameter pilot hole 2,112 to 2,206 ft bpl.
01/02/10	Night	DL	Drilled Core No 1 (2,206 - 2,216 ft bpl).
01/03/10	Day	DB	Completed drilling Core No 1.
01/03/10	Night	DL	Drilled 12.25-inch diameter pilot hole 2,206 to 2,299 ft bpl.
01/04/10	Day	DB	Drilled 12.25 inch diameter pilot hole 2,299 to 2,303 ft bpl.
01/04/10	Night	DL	Drilled Core No 2 (2,303 - 2,313 ft bpl).
01/05/10	Day	DB	Completed Core No 2 (100% recovery).
01/05/10	Night	DL	Drilled 12.25-inch diameter pilot hole 2,303 - 2,339 ft bpl.
01/06/10	Day	DB	Drilled 12.25-inch diameter pilot hole 2,339 - 2,434 ft bpl.
01/06/10	Night	DL	Drilled 12.25-inch diameter pilot hole 2,434 - 2,472 ft bpl.
01/07/10	Day	DB	Drilled 12.25-inch diameter pilot hole 2,472 - 2,502 ft bpl.
01/07/10	Night	DL	Drilled 12.25-inch diameter pilot hole 2,502 - 2,505 ft bpl. Start Core No 3 (2,505 -2,515 ft bpl).

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 10

ENDING DATE: 01/15/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/08/10	Day	RS	Drilled core no. 3 from 2,505 to 2,510 feet bpl
01/08/10	Night	DL	Drilled core no. 3 from 2,510 to 2,513 feet bpl
01/09/10	Day	RS	Finished Core No. 3 at 2,513 feet bpl, tripped out core and tripped in 12.25-inch diameter bit to 1,900 feet bpl
01/09/10	Night	DL	Rig maintenance, reamed core interval 2,505 to 2,513 feet bpl with 12.25-inch diameter bit, drilled 12.25-inch diameter pilot hole to 2,525 feet bpl
01/10/10	Day	RS	Drilled 12.25-inch diameter pilot hole to 2,569 feet bpl. Inclination survey completed at 2,530 feet bpl
01/10/10	Night	DL	Drilled 12.25-inch diameter pilot hole to 2,644 feet bpl
01/11/10	Day	RM	Drilled 12.25-inch diameter pilot hole to 2,730 feet bpl. Started trip out of hole in preparation for Core No. 4
01/11/10	Night	RS	Finished trip out of 12.25-inch diameter bit, started core no. 4 at 2,729 feet bpl
01/12/10	Day	RM	Completed core no. 4 at 2,546.5 feet bpl, tripped out core barrel, tripped in 12.25-inch diameter bit for pilot hole
01/12/10	Night	RS	Finished trip in of 12.25-inch diameter bit and completed pilot hole to 2,798 feet bpl, inclination survey completed at 2,710 feet bpl
01/13/10	Day	DB	Drilled 12.25-inch diameter pilot hole to 2,817 feet bpl, tripped in core barrel to 2,817 feet bpl for core no. 5.
01/13/10	Night	RS	Drilled core from 2,816 to 2,829 feet bpl
01/14/10	Day	DB	Completed core no. 5
01/14/10	Night	RS	Drilled 12.25-inch diameter pilot hole to 2,890 feet bpl.

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 11

ENDING DATE: 01/22/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/15/10	Day	DB	Drill 12.25-inch pilot hole 2961 - 3043 ft bpl
01/15/10	Night	DL	Drill 12.25-inch pilot hole 3043 - 3070 ft bpl
01/16/10	Day	DB	Drill 12.25-inch pilot hole 3070 - 3107 ft bpl
01/16/10	Night	DL	Drill 12.25-inch pilot hole 3107 - 3131 ft bpl
01/17/10	Day	DB	Drill 12.25-inch pilot hole 3131 - 3158 ft bpl
01/17/10	Night	FB	Drill 12.25-inch pilot hole 3158 - 3183 ft bpl
01/18/10	Day	DB	Drill 12.25-inch pilot hole 3183 - 3204 ft bpl
01/18/10	Night	FB	Drill 12.25-inch pilot hole 3204 - 3223 ft bpl
01/19/10	Day	DB	Drill 12.25-inch pilot hole 3223 - 3249 ft bpl
01/19/10	Night	DL	Drill 12.25-inch pilot hole 3249 - 3276 ft bpl
01/20/10	Day	DB	Drill 12.25-inch pilot hole 3276 - 3285 ft bpl
01/20/10	Night	DL	Drill 12.25-inch pilot hole 3285 - 3321 ft bpl
01/22/10	Day	DB	Drill 12.25-inch pilot hole 3321 - 3347 ft bpl
01/22/10	Night	DL	Drill 12.25-inch pilot hole 3347 - 3375 ft bpl

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 12

ENDING DATE: 01/29/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/22/10	Day	RS	Drill 12.25-inch pilot hole 3375 - 3393 ft.
01/22/10	Night	DL	Drill 12.25-inch pilot hole 3393 - 3458 ft.
01/23/10	Day	RS	Drill 12.25-inch pilot hole to 3500 feet (TD).
01/23/10	Night	DL	Ran wiper trip.
01/24/10	Day	RS	Ran geophysical logs on the 12.25-inch pilot hole.
01/24/10	Night	DL	Ran borehole video on 12.25-inch pilot hole.
01/25/10	Day	BM	Ran borehole televiewer log on 12.25-inch pilot hole.
01/25/10	Night	RS	Tripped in for packer test no. 4 and air developed.
01/26/10	Day	BM	Started packer test no. 4 (2234 - 2251.5 ft bpl)
01/26/10	Night	RS	Finished packer test no. 4.
01/27/10	Day	BM	Moved packer to for test no. 5 (2399-2416.5 ft bpl) and started development.
01/27/10	Night	RS	Finished development and started the pumping phase for packer test no. 5.
01/28/10	Day	DB	Finished packer test no. 5; started packer test no. 6 (2639-2656.5 ft bpl).
01/28/10	Night	RS	Continued packer test no.6.

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WEEK NO.: 13

ENDING DATE: 02/05/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
1/29/10	Day	D.Barnes	Complete Packer Test #6. Trip out of pilot hole.
1/29/10	Night	D. Legett	Lower bridge plug and fill lower basket with 1 bbl cement/CaCl2 mix.
1/30/10	Day	D.Barnes	Complete filling bridge plug, pump 60 bbl 12% mix.
1/30/10	Night	D. Legett	Pump Cement Stages 1 - 3 of pilot hole cement back.
1/31/10	Day	D.Barnes	Pump Cement Stages 4 - 7 of pilot hole cement back.
1/31/10	Night	D. Legett	Pump Cement Stages 8 - 10 of pilot hole cement back.
2/01/10	Day	D.Barnes	Pump Cement Stages 11 - 12 of pilot hole cement back.
2/01/10	Night	D. Legett	Put BHA together and begin tripping in with 32.5 inch diameter bit.
2/02/10	Day	D.Barnes	Begin 32.5 inch diameter ream. Ream 1,887 to 1,919 ft bpl.
2/02/10	Night	D. Legett	Ream 32.5-inch diameter borehole 1,919 to 1,999 ft bpl
2/03/10	Day	D.Barnes	Ream 32.5-inch diameter borehole 1,999 to 2,068 ft bpl.
2/03/10	Night	D. Legett	Ream 32.5-inch diameter borehole 2,068 to 2,134 ft bpl.
2/04/10	Day	D.Barnes	Ream 32.5-inch diameter borehole 2,134 to 2,189 ft bpl.
2/04/10	Night	D. Legett	Ream 32.5-inch diameter borehole 2,189 to 2,240 ft bpl.

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WEEK NO.: 14

ENDING DATE: 02/12/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/05/10	Day	JA	Reamed 32.5 inch bit from 2238 to 2283 ft bpl.
02/05/10	Night	RS	Reamed 32.5 inch bit from 2283 to 2299 ft bpl. Completed inclination survey.
02/06/10	Day	JA	Reamed 32.5 inch bit from 2299 to 2312 ft bpl.
02/06/10	Night	RS	Reamed 32.5 inch bit from 2312 to 2339 ft bpl.
02/07/10	Day	JA	Reamed 32.5 inch bit from 2339 to 2389 ft bpl. Completed inclination survey.
02/07/10	Night	RS	Reamed 32.5 inch bit from 2389 to 2423 ft bpl.
02/08/10	Day	JA	Reamed 32.5 inch bit from 2423 to 2439 ft bpl.
02/08/10	Night	RS	Reamed 32.5 inch bit from 2439 to 2449 ft bpl.
02/09/10	Day	JA	Reamed 32.5 inch bit from 2449 to 2460 ft bpl.
02/09/10	Night	RS	Reamed 32.5 inch bit from 2460 to 2471 ft bpl. Completed inclination survey.
02/10/10	Day	JA	Reamed 32.5 inch bit from 2471 to 2482 ft bpl. Trip out and make repair to bit and add to BHA.
02/10/10	Night	RS	Continue repairs and build BHA.
02/11/10	Day	JA	Trip in 32.5 inch bit with additional collar and weights.
02/11/10	Night	RS	Reamed 32.5 inch bit from 2482 to 2495 ft bpl.

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 15

ENDING DATE: 02/19/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/12/10	Day	D.Barnes	Ream 32.5-inch borehole 2495 - 2508 ft bpl
02/12/10	Night	D. Legett	Ream 32.5-inch borehole 2508 - 2539 ft bpl.
02/13/10	Day	D.Barnes	Ream 32.5-inch borehole 2539 - 2597 ft bpl.
02/13/10	Night	D. Legett	Ream 32.5-inch borehole 2597 - 2629 ft bpl.
02/14/10	Day	D.Barnes	Ream 32.5-inch borehole 2629 - 2710 ft bpl.
02/14/10	Night	D. Legett	Ream 32.5-inch borehole 2710 - 2761 ft bpl.
02/15/10	Day	D.Barnes	Ream 32.5-inch borehole 2761 - 2841 ft bpl.
02/15/10	Night	D. Legett	Ream 32.5-inch borehole 2841 - 2886 ft bpl.
02/16/10	Day	D.Barnes	Ream 32.5-inch borehole 2886 - 2930 ft bpl.
02/16/10	Night	D. Legett	Ream 32.5-inch borehole 2930 - 2970 ft bpl.
02/17/10	Day	D.Barnes	Trip out 32.5-inch bit.
02/17/10	Night	D. Legett	Trip in 22.5-inch bit. Drill stepped borehole (33 - 22-inch) 2970 - 2974 ft bpl.
02/18/10	Day	D.Barnes	Trip out step drill assembly. Trip in 22.5-inch reaming assembly.
02/18/10	Night	D.Legett	Ream 22.5-inch borehole 2974 - 3024 ft bpl.

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 16

ENDING DATE: 02/26/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/19/10	Day	R. Stross	Reamed 22.5-inch borehole 3024 - 3046 ft bpl
02/19/10	Night	D. Legett	Reamed 22.5-inch borehole 3046 - 3053 ft bpl
02/20/10	Day	R. Stross	Reamed 22.5-inch borehole 3053 - 3062 ft bpl
02/20/10	Night	D. Legett	Reamed 22.5-inch borehole 3062 - 3074 ft bpl
02/21/10	Day	R. Stross	Reamed 22.5-inch borehole 3074 - 3096 ft bpl
02/21/10	Night	D. Legett	Reamed 22.5-inch borehole 3096 - 3104 ft bpl
02/22/10	Day	S. Manahan	Reamed 22.5-inch borehole 3104 - 3111 ft bpl
02/22/10	Night	R. Stross	Reamed 22.5-inch borehole 3111 - 3118 ft bpl
02/23/10	Day	S. Manahan/D. Hoffman	Reamed 22.5-inch borehole 3118 - 3123 ft bpl
02/23/10	Night	R. Stross	Reamed 22.5-inch borehole 3123 - 3130 ft bpl
02/24/10	Day	D. Hoffman	Reamed 22.5-inch borehole 3130 - 3141 ft bpl
02/24/10	Night	R. Stross	Reamed 22.5-inch borehole 3141 - 3168 ft bpl
02/25/10	Day	D. Barnes	Reamed 22.5-inch borehole 3168 - 3187 ft bpl
02/25/10	Night	R. Stross	Reamed 22.5-inch borehole 3187 - 3208 ft bpl

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 17

ENDING DATE: 03/05/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/26/10	Day	D. Barnes	Ream 22.5-inch borehole from 3210 to 3220 ft bpl.
02/26/10	Night	D. Legett	Ream 22.5-inch borehole from 3220 to 3235 ft bpl.
02/27/10	Day	D. Barnes	Ream 22.5-inch borehole from 3235 to 3243 ft bpl.
02/27/10	Night	D. Legett	Ream 22.5-inch borehole from 3243 to 3267 ft bpl.
02/28/10	Day	D. Barnes	Ream 22.5-inch borehole from 3267 to 3288 ft bpl.
02/28/10	Night	D. Legett	Ream 22.5-inch borehole from 3288 to 3315 ft bpl.
03/01/10	Day	D. Barnes	Ream 22.5-inch borehole from 3315 to 3348 ft bpl.
03/01/10	Night	D. Legett	Ream 22.5-inch borehole from 3348 to 3373 ft bpl.
03/02/10	Day	D. Barnes	Ream 22.5-inch borehole from 3373 to 3396 ft bpl.
03/02/10	Night	D. Legett	Ream 22,5-inch borehole from 3396 to 3451 ft bpl.
03/03/10	Day	D. Barnes	Ream 22,5-inch borehole from 3451 to 3468 ft bpl.
03/03/10	Night	D. Legett	Ream 22,5-inch borehole from 3468 to 3496 ft bpl.
03/04/10	Day	D. Barnes	Ream 22,5-inch borehole from 3496 to 3505 ft bpl.
03/04/10	Night	D. Legett	Run caliper and gamma ray logs on reamed 32.5 and 22.5-inch intervals.

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WEEK NO.: 18 ENDING DATE: 03/12/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/05/10	Day	JA	Disassembled drill string, rig maintenance
03/05/10	Night	RAS	Trip out and prepare to run the 24-inch casing.
03/06/10	Day	JA	Welded and lowered 24-inch diameter casing
03/06/10	Night	RAS	Welded and lowered 24-inch diameter casing
03/07/10	Day	JA	Welded and lowered 24-inch diameter casing
03/07/10	Night	RAS	Finished welding of 24-inch diameter casing, set-up for pressure test
03/08/10	Day	JA	Performed pressure test
03/08/10	Night	RAS	Cemented base of 24-inch diameter casing
03/09/10	Day	JA	Continued cementing of base of 24-inch diameter casing
03/09/10	Night	RAS	Completed cement stage 1
03/10/10	Day	JA	Completed cement stage 2
03/10/10	Night	RAS	Completed cement stage 3
03/11/10	Day	JA	Completed cement stage 4
03/11/10	Night	RAS	Completed cement stage 5

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 19 ENDING DATE: 03/19/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/12/10	Day	DB	Pump Cement Stages 6 and 7 for 24-inch casing.
03/12/10	Night	DL	Pump Cement Stages 8, 9, and 10 for 24-inch casing.
03/13/10	Day	DB	Pump Cement Stage 11 for 24-inch casing.
03/13/10	Night	DL	Pump Cement Stage 12 for 24-inch casing.
03/14/10	Day	DB	Pump Cement Stage 13 for 24-inch casing.
03/14/10	Night	DL	Pump Cement Stage 14 for 24-inch casing.
03/15/10	Day	DB	Circulate water through 24-inch casing to accelerate cooling.
03/15/10	Night	DL	Circulate water through 24-inch casing to accelerate cooling.
03/16/10	Day	DB	Run Cement Bond Log. Trip into hole with packer for pressure test.
03/16/10	Night	DL	Run 24-inch casing pressure pre-test.
03/17/10	Day	DB	Run 24-inch casing pressure test with FDEP onsite. Finish cement (stage 15) to land surface for 24-inch casing.
03/17/10	Night	DL	Prepare for FRP run.
03/18/10	Day	DB	Run FRP.
03/18/10	Night	DL	Rig inactive until day shift.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-1

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 20 ENDING DATE: 03/26/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/19/10	Day	JA	Weld stainless steel tubing to injection tubing, video fresh water flush pass YBI packer. Begin fill of annulus with 1% Barracore.
03/19/10	Night	RAS	Seat FRP on packer after verifying flush passed packer.
03/20/10	Day	JA	Cut Stainless Steel tubing to pad level.
03/20/10	Night	RAS	Partial development for primary and secondary water sampling.
03/21/10	Day	JA	Rigging down.
03/21/10	Night	RAS	Resume development to sample in morning
03/22/10	Day	JA	Sampling suspended, sampler had incorrect bottles. Rigging down.
03/22/10	Night	RAS	Inactive.
03/23/10	Day	JA	Rigging down. Move pad off well.
03/23/10	Night	RAS	Resume development to sample in morning.
03/24/10	Day	JA	Sample for primary and secondary. Cut tubing below casings for protection.
03/24/10	Night	RAS	Inactive.
03/25/10	Day	JA	Cover well for protection during drilling of monitor well.
03/25/10	Night	DH	Inactive. All remaining work on IW-1 is temporarily on hole until completion of MW-1. Daily logs for IW-1 will be completed when work continues.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-1

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 27 ENDING DATE: 05/14/2010

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WEEKLY CONSTRUCTION SUMMARY

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 28 ENDING DATE: 05/21/2010

[illegible]

IW-2

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 2

ENDING DATE: 11/20/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/13/09	Day	NA	No well construction activity - rigging up
11/13/09	Night	NA	No activity
11/14/09	Day	NA	No construction activity - rigging up
11/14/09	Night	NA	No activity
11/15/09	Day	NA	No construction activity - rigging up
11/15/09	Night	NA	No activity
11/16/09	Day	NA	No construction activity - rigging up
11/16/09	Night	NA	No activity
11/17/09	Day	NA	No construction activity - rigging up
11/17/09	Night	NA	No activity
11/18/09	Day	SD	Drill nominal 60.5-inch diameter borehole from 0 ft bpl to 33.5 ft bpl
11/18/09	Night	JA	Connect stand 1 to BHA.
11/19/09	Day	SD	Drill nominal 60.5-inch diameter borehole from 33.5 ft bpl to 158 ft bpl, conducted inclination survey at 90 ft bpl.
11/19/09	Night	JA	Condition borehole, remove drill string, conduct geophysical logs.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 3

ENDING DATE: 11/20/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/20/09	Day	DB	Weld, lower, and cement 52-inch casing 0 to 155 ft.
11/20/09	Night	DL	Run temperature log on 52-inch casing.
11/21/09	Day	DB	Rig maintenance
11/21/09	Night	DL	No well construction activity.
11/22/09	Day	DB	No well construction activity.
11/22/09	Night	DL	No well construction activity.
11/23/09	Day	DB	No well construction activity.
11/23/09	Night	DL	No well construction activity.
11/24/09	Day	DB	No well construction activity.
11/24/09	Night	DL	No well construction activity.
11/25/09	Day	DB	No well construction activity.
11/25/09	Night	DL	No well construction activity.
11/26/09	Day	DB	No well construction activity.
11/26/09	Night	DL	No well construction activity.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 4

ENDING DATE: 12/04/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
11/27/09	Day	JA	No activity
11/27/09	Night	RAS	No activity
11/28/09	Day	JA	Rig maintenance
11/28/09	Night	RAS	Rig maintenance, drilled out cement plug in 52-inch casing
11/29/09	Day	JA	Drilled 50.5-inch borehole from base of 52-inch casing to 193 feet bpl
11/29/09	Night	RAS	Drilled 50.5-inch borehole from 193 to 261 feet bpl
11/30/09	Day	JA	Drilled 50.5-inch borehole from 261 to 315 feet bpl
11/30/09	Night	RAS	Drilled 50.5-inch borehole from 315 to 360 feet bpl
12/01/09	Day	JA/BP	Drilled 50.5-inch borehole from 360 to 418 feet bpl
12/01/09	Night	RAS	Drilled 50.5-inch borehole from 418 to 476 feet bpl
12/02/09	Day	BP	Drilled 50.5-inch borehole from 476 to 531 feet bpl
12/02/09	Night	RAS	Drilled 50.5-inch borehole from 531 to 612 feet bpl
12/03/09	Day	BP	Drilled 50.5-inch borehole from 612 to 666 feet bpl
12/03/09	Night	RAS	Drilled 50.5-inch borehole from 666 to 729 feet bpl

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 5

ENDING DATE: 12/11/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/04/09	Day	BJP	Drill 50.5-inch borehole 742 to 784 ft bpl.
12/04/09	Night	BDL	Drill 50.5-inch borehole 784 to 801 ft bpl.
12/05/09	Day	BJP	Drill 50.5-inch borehole 801 to 805 ft bpl.
12/05/09	Night	BDL	Drill 50.5-inch borehole 805 to 870 ft bpl.
12/06/09	Day	BJP	Drill 50.5-inch borehole 870 to 932 ft bpl.
12/06/09	Night	BDL	Drill 50.5-inch borehole 932 to 966 ft bpl.
12/07/09	Day	BJP	Drill 50.5-inch borehole 966 to 970 ft bpl.
12/07/09	Night	BDL	Drill 50.5-inch borehole 970 to 998 ft bpl.
12/08/09	Day	BJP	Drill 50.5-inch borehole 998 to 1001 ft bpl.
12/08/09	Night	BDL	Trip drill bit to remove clay ball.
12/08/09	Day	BJP	Drill 50.5-inch borehole 1001 to 1011 ft bpl.
12/09/09	Night	BDL	Drill 50.5-inch borehole 1011 to 1029 ft bpl.
12/10/09	Day	BJP	Drill 50.5-inch borehole 1029 to 1082 ft, which is TD for this interval.
12/10/09	Night	BDL	Circulate and short trip drill pipe to condition mud and borehole.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 6

ENDING DATE: 12/18/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/11/09	Day	BJP	Conditioned 50.5-inch diameter borehole completed to 1082 feet bpl
12/11/09	Night	RS	Tripped out of borehole, complete geophysical logging of 50.5-inch borehole
12/12/09	Day	BJP	Landed 42-inch diameter casing in 50.5-inch diameter borehole
12/12/09	Night	RS	Pressure grouted 42-inch diameter casing
12/13/09	Day	JA	Trip out cement tubing and trip in tremie
12/13/09	Night	RS	Completed temperature log, continue cementing of 42-inch diameter casing
12/14/09	Day	JA	Completed temperature log
12/14/09	Night	RS	Rig maintenance, tripped in 12.25-inch diameter bit for pilot hole
12/15/09	Day	JA	Drill site maintenance
12/15/09	Night	RS	Rig maintenance
12/16/09	Day	DB	Rig inactive
12/16/09	Night	RS	Started 12.25-inch diameter pilot hole, completed to 1224 feet bpl
12/17/09	Day	DB	Drilled 12.25-inch diameter pilot hole to 1358 feet bpl
12/17/09	Night	RS	Drilled 12.25-inch diameter pilot hole to 1621 feet bpl

WEEKLY CONSTRUCTION SUMMARY

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 7

ENDING DATE: 12/25/09

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/18/09	Day	DL	Drilled 12.25-inch diameter pilot hole 1634 - 1801 ft.
12/18/09	Night	RS	Drilled 12.25-inch diameter pilot hole 1801 - 1940 ft.
12/19/09	Day	DL	Conditioned pilot hole, prepared for geophysical logging.
12/19/09	Night	DL	Ran geophysical logs.
12/20/09	Day	DB	Prepared Packer Test Number 1 (1883 - 1901 ft).
12/20/09	Night	DL	Started Packer Test Number 1.
12/21/09	Day	DB	Completed Packer Test Number 1.
12/21/09	Night	DL	Completed first stage of cementing pilot hole.
12/22/09	Day	DB	Finished cementing pilot hole.
12/22/09	Night		No rig activity.
12/23/09	Day		No rig activity.
12/23/09	Night		No rig activity.
12/24/09	Day		No rig activity.
12/24/09	Night		No rig activity.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 8

ENDING DATE: 01/01/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
12/25/09	day	none	No rig activity.
12/25/09	night	none	No rig activity.
12/26/09	day	JA	Stand by, waiting on 40.5-inch diameter BHA.
12/26/09	night	RAS	Stand by, waiting on 40.5-inch diameter BHA.
12/27/09	day	JA	Stand by, waiting on 40.5-inch diameter BHA.
12/27/09	night	RAS	Stand by, waiting on 40.5-inch diameter BHA.
12/28/09	day	JA	Rig maintenance and building BHA.
12/28/09	night	RAS	Partial trip in of BHA
12/29/09	day	JA	Rig electronics maintenance.
12/29/09	night	RAS	Partial trip in of BHA.
12/30/09	day	JA	12 stands and BHA have been tripped into borehole.
12/30/09	night	RAS	Reamed to 1,115 ft bpl.
12/31/09	day	JA	Performed inclination survey at 1,115 ft bpl. Reamed to 1,125 feet bpl.
12/31/09	night	RAS	Performed inclination survey at 1,205 ft bpl. Reamed to 1,205 feet bpl.

WEEKLY CONSTRUCTION SUMMARY

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 9

ENDING DATE: 01/08/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/01/10	Day	DB	Reamed 40.5-inch diameter borehole 1224 to 1299 ft bpl.
01/01/10	Night	DL	Reamed 40.5-inch diameter borehole 1299 to 1391 ft bpl.
01/02/10	Day	DB	Reamed 40.5-inch diameter borehole 1391 to 1441 ft bpl.
01/02/10	Night	DL	Reamed 40.5-inch diameter borehole 1441 to 1491 ft bpl.
01/03/10	Day	DB	Reamed 40.5-inch diameter borehole 1491 to 1538 ft bpl.
01/03/10	Night	DL	Reamed 40.5-inch diameter borehole 1538 to 1568 ft bpl.
01/04/10	Day	DB	Reamed 40.5-inch diameter borehole 1568 to 1587 ft bpl.
01/04/10	Night	DL	Reamed 40.5-inch diameter borehole 1587 to 1655 ft bpl.
01/05/10	Day	DB	Reamed 40.5-inch diameter borehole 1655 to 1715 ft bpl.
01/05/10	Night	DL	Reamed 40.5-inch diameter borehole 1715 to 1760 ft bpl.
01/06/10	Day	DB	Reamed 40.5-inch diameter borehole 1760 to 1830 ft bpl.
01/06/10	Night	DL	Reamed 40.5-inch diameter borehole 1830 to 1885 ft bpl.
01/07/10	Day	DB	Reamed 40.5-inch diameter borehole 1885 to 1905 ft bpl.
01/07/10	Night	DL	Rig shut down pending delivery of casing.

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SITE LOCATION: Hialeah RO

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 10

ENDING DATE: 01/15/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/08/10	Day	RS	Rig shut down pending delivery of 34-inch casing.
01/08/10	Night	DL	Rig shut down pending delivery of 34-inch casing.
01/09/10	Day	RS	Rig shut down pending delivery of 34-inch casing.
01/09/10	Night	DL	Rig shut down pending delivery of 34-inch casing.
01/10/10	Day	RS	Rig shut down pending delivery of 34-inch casing.
01/10/10	Night	DL	Rig shut down pending delivery of 34-inch casing.
01/11/10	Day	RM	Rig shut down pending delivery of 34-inch casing.
01/11/10	Night	RS	Started preparation for setting casing. Logged reamed hole
01/12/10	Day	RM	Started installation of 34-inch diameter intermediate casing. Installed 1150 ft.
01/12/10	Night	RS	Weld and lower 34-inch casing to 1900 ft.
01/13/10	Day	DB	Complete cement stage 1 (pressure grout).
01/13/10	Night	RS	Complete cement stage 2.
01/14/10	Day	DB	Complete cement stage 3.
01/14/10	Night	RS	Started cement stage 4.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 11

ENDING DATE: 01/22/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/15/10	Day	DB	Pump Cement Stage No 5 for the 34-inch casing.
01/15/10	Night	DL	Wait for Cement Stage No 5 to harden and ran temperature log
01/16/10	Day	DB	Pump Cement Stage No 6 and ran temperature log.
01/16/10	Night	DL	Wait for Cement Stage No. 6 to harden.
01/17/10	Day	DB	Drill 12.25-inch pilot hole to core no. 1 depth of 1950 ft bpl.
01/17/10	Night	FB	Drill Core No. 1 (1952 - 1968 ft bpl).
01/18/10	Day	DB	Recover Core No. 1.
01/18/10	Night	FB	Drill with 12.25 inch bit to core no. 2 depth of 2050 ft bpl.
01/19/10	Day	DB	Drill and recover Core No 2 (2050 - 2065 ft bpl).
01/19/10	Night	DL	Drill with 12.25-inch bit to the Core No 3 depth of 2100 ft bpl.
01/20/10	Day	DB	Drill Core No 3 (2100 to 2108.5 ft bpl).
01/20/10	Night	DL	Recover Core No 3 and drill 12.25-inch pilot hole 2109 to 2156 ft bpl.
01/21/10	Day	DB	Drill 12.25-inch pilot hole from 2156 to 2296 ft bpl.
01/21/10	Night	DL	Drill 12.25-inch pilot hole from 2296-2408 feet bpl.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 12

ENDING DATE: 01/29/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
01/22/10	Day	RS	Drill 12.25-inch pilot hole from 2420 to 2432 ft bpl.
01/22/10	Night	DL	Drill Core No. 4 (2432 - 2439.6 ft bpl).
01/23/10	Day	RS	Continued drilling Core No. 4.
01/23/10	Night	DL	Continued drilling Core No. 4.
01/24/10	Day	RS	Completed core 4, resumed drilling 12.25-inch pilot hole to 2461 ft bpl.
01/24/10	Night	DL	Drilled 12.25-inch pilot hole from 2461 to 2521 ft bpl.
01/25/10	Day	BM	Drilled 12.25-inch pilot hole from 2521 to 2579 ft bpl.
01/25/10	Night	RS	Drilled 12.25-inch pilot hole from 2579 to 2737 ft bpl.
01/26/10	Day	BM	Drilled 12.25-inch pilot hole from 2737 to 2775 ft bpl. Tripped in core bit.
01/26/10	Night	RS	Started core no. 5 (2775 - 2786 ft bpl)
01/27/10	Day	BM	Completed core no. 5.
01/27/10	Night	RS	Drilled 12.25-inch pilot hole from 2774 to 2864 ft bpl.
01/28/10	Day	DB	Drilled 12.25-inch pilot hole from 2864 to 3015 ft bpl.
01/28/10	Night	RS	Drilled 12.25-inch pilot hole from 3015 to 3090 ft bpl.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 13

ENDING DATE: 02/05/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
1/29/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,090 to 3,123 ft bpl.
1/29/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,123 to 3,145 ft bpl.
1/30/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,145 to 3,157 ft bpl.
1/30/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,157 to 3,171 ft bpl.
1/31/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,171 to 3,196 ft bpl.
1/31/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,196 to 3,213 ft bpl.
2/01/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,213 to 3,228 ft bpl.
2/01/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,228 to 3,252 ft bpl.
2/02/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,252 to 3,272 ft bpl.
2/02/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,272 to 3,297 ft bpl.
2/03/10	Day	D.Barnes	Drill 12.25-inch diameter pilot hole from 3,297 to 3,320 ft bpl.
2/03/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,320 to 3,332 ft bpl.
2/04/10	Day	D.Barnes	Change drill bit.
2/04/10	Night	D. Legett	Drill 12.25-inch diameter pilot hole from 3,332 to 3,364 ft bpl.

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SITE LOCATION: Hialeah RO

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 14

ENDING DATE: 02/12/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/05/10	Day	JA	Drill 12.25-inch pilot hole from 3364 to 3388 ft bpl.
02/05/10	Night	RS	Drill 12.25-inch pilot hole from 3388 to 3451 ft bpl.
02/06/10	Day	JA	Drill 12.25-inch pilot hole from 3451 to 3500 ft bpl.
02/06/10	Night	RS	Complete wiper trip.
02/07/10	Day	JA	Geophysical logs, resistivity, gamma, dual induction, sonic, BHTV.
02/07/10	Night	RS	Geophysical flow log and trip in packer 2 (2049 - 2066.5 ft bpl).
02/08/10	Day	JA	Air development and pump development of packer 2.
02/08/10	Night	RS	Background log, pump test, and recovery log of packer 2.
02/09/10	Day	JA	Set packer 3 (2569 - 2586.5 ft bpl), air develop and decide to relocate packer. Set packer 3B (2724 - 2741.5 ft bpl), air develop, pump develop, begin background.
02/09/10	Night	RS	Complete background log, pump test, and recovery of packer 3B.
02/10/10	Day	JA	Set packer 4 (2259 - 2276.5 ft bpl), air develop, pump develop, and begin background log.
02/10/10	Night	RS	Continue background log of packer 4, pump test, and begin recover log.
02/11/10	Day	JA	Complete recovery log.
02/11/10	Night	RS	Set bridge plug.

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SITE LOCATION: Hialeah RO

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CONTRACTOR: YOUNGQUIST

WEEK NO.: 15

ENDING DATE: 02/19/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/12/10	Day	D.Barnes	Fill bridge plug (3010 ft bpl) with cement.
02/12/10	Night	D. Legett	Pump cap and Cement Stages 1 and 2 on pilot hole cement back.
02/13/10	Day	D.Barnes	Pump Cement Stages 3, 4, and 5.
02/13/10	Night	D. Legett	Pump Cement Stages 6, 7, and 8.
02/14/10	Day	D.Barnes	Pump Cement Stages 9, 10, 11, and 12.
02/14/10	Night	D. Legett	Pump Cement Stage 13.
02/15/10	Day	D.Barnes	Ream 32.5-inch borehole 1889 - 1902 ft bpl.
02/15/10	Night	D. Legett	Ream 32.5-inch borehole 1902 - 1974 ft bpl.
02/16/10	Day	D.Barnes	Ream 32.5-inch borehole 1974 - 2042 ft bpl.
02/16/10	Night	D. Legett	Ream 32.5-inch borehole 2042 - 2129 ft bpl.
02/17/10	Day	D.Barnes	Ream 32.5-inch borehole 2129 - 2148 ft bpl.
02/17/10	Night	D. Legett	Ream 32.5-inch borehole 2148 - 2213 ft bpl.
02/18/10	Day	D.Barnes	Ream 32.5-inch borehole 2213 - 2255 ft bpl.
02/18/10	Night	D. Legett	Ream 32.5-inch borehole 2255 - 2297 ft bpl.

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 16

ENDING DATE: 02/26/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/19/10	Day	R. Stross	Reamed 32.5-inch borehole 2297 - 2309 ft bpl
02/19/10	Night	D. Legett	Reamed 32.5-inch borehole 2309 - 2328 ft bpl
02/20/10	Day	R. Stross	Reamed 32.5-inch borehole 2328 - 2385 ft bpl
02/20/10	Night	D. Legett	Reamed 32.5-inch borehole 2385 - 2434 ft bpl
02/21/10	Day	R. Stross	Reamed 32.5-inch borehole 2434 - 2450 ft bpl
02/21/10	Night	D. Legett	Reamed 32.5-inch borehole 2450 - 2456 ft bpl
02/22/10	Day	S. Manahan	Tripped out to add weight to BHA
02/22/10	Night	R. Stross	Reamed 32.5-inch borehole 2456 - 2460 ft bpl
02/23/10	Day	S. Manahan	Reamed 32.5-inch borehole 2460 - 2480 ft bpl
02/23/10	Night	R. Stross	Reamed 32.5-inch borehole 2480 - 2498 ft bpl
02/24/10	Day	S. Manahan	Reamed 32.5-inch borehole 2498 - 2519 ft bpl
02/24/10	Night	R. Stross	Reamed 32.5-inch borehole 2519 - 2560 ft bpl
02/25/10	Day	S. Manahan	Reamed 32.5-inch borehole 2560 - 2591 ft bpl
02/25/10	Night	R. Stross	Reamed 32.5-inch borehole 2591 - 2662 ft bpl

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 17

ENDING DATE: 03/05/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
02/26/10	Day	D. Barnes	Ream 32.5-inch borehole from 2667 to 2723 ft bpl.
02/26/10	Night	D. Legett	Ream 32.5-inch borehole from 2723 to 2784 ft bpl.
02/27/10	Day	D. Barnes	Ream 32.5-inch borehole from 2784 to 2856 ft bpl.
02/27/10	Night	D. Legett	Ream 32.5-inch borehole from 2856 to 2903 ft bpl.
02/28/10	Day	D. Barnes	Ream 32.5-inch borehole from 2903 to 2950 ft bpl.
02/28/10	Night	D. Legett	Ream 32.5-inch borehole from 2950 to 2970 ft bpl.
03/01/10	Day	D. Barnes	Trip out of hole to pick up 32.5 to 22.5-inch step BHA.
03/01/10	Night	D. Legett	Change out the 32.5-inch BHA for the 32.5-inch to 22.5-inch step BHA.
03/02/10	Day	D. Barnes	Ream the 32.5 to 22.5-inch step 2970 to 2974 ft bpl.
03/02/10	Night	D. Legett	Ream 22.5-inch borehole 2974 to 3044 ft bpl.
03/03/10	Day	D. Barnes	Ream 22.5-inch borehole 3044 to 3077 ft bpl.
03/03/10	Night	D. Legett	Ream 22.5-inch borehole 3077 to 3099 ft bpl.
03/04/10	Day	D. Barnes	Ream 22.5-inch borehole 3099 to 3110 ft bpl.
03/04/10	Night	D. Legett	Ream 22.5-inch borehole 3110 to 3121 ft bpl.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 18 ENDING DATE: 03/12/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/05/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3133 feet bpl
03/05/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3141 feet bpl, trip out the bit.
03/06/10	Day	JA	Tripped out of hole, checked bit, removed collars and added stabilizers
03/06/10	Night	RAS	Tripped in and cleaned out bottom of borehole
03/07/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3141 feet bpl
03/07/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3151 feet bpl
03/08/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3170 feet bpl
03/08/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3187 feet bpl
03/09/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3203 feet bpl
03/09/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3216 feet bpl
03/10/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3262 feet bpl
03/10/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3262 feet bpl
03/11/10	Day	JA	Reamed the 22.5-inch diameter borehole to 3279 feet bpl
03/11/10	Night	RAS	Reamed the 22.5-inch diameter borehole to 3304 feet bpl

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 19 ENDING DATE: 03/19/10

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
3/12/10	Day	D. Barnes	Ream 22.5-inch borehole from 3307 to 3322 ft bpl.
3/12/10	Night	D. Legett	Ream 22.5-inch borehole from 3322 to 3336 ft bpl.
3/13/10	Day	D. Barnes	Ream 22.5-inch borehole from 3336 to 3347 ft bpl.
3/13/10	Night	D. Legett	Ream 22.5-inch borehole from 3347 to 3356 ft bpl. Bit trip.
3/14/10	Day	D. Barnes	Bit trip. Back to bottom with new 22.5-inch bit.
3/14/10	Night	D. Legett	Ream 22.5-inch borehole from 3356 to 3364 ft bpl.
3/15/10	Day	D. Barnes	Ream 22.5-inch borehole from 3364 to 3377 ft bpl.
3/15/10	Night	D. Legett	Ream 22.5-inch borehole from 3377 to 3384 ft bpl.
3/16/10	Day	D. Barnes	Ream 22.5-inch borehole from 3384 to 3403 ft bpl.
3/16/10	Night	D. Legett	Ream 22.5-inch borehole from 3403 to 3457 ft bpl.
3/17/10	Day	D. Barnes	Ream 22.5-inch borehole from 3457 to 3474 ft bpl.
3/17/10	Night	D. Legett	Ream 22.5-inch borehole from 3474 to 3505 ft bpl (final TD).
3/18/10	Day	D. Barnes	Short trip drill pipe, begin to lay down drill pipe.
3/18/10	Night	D. Legett	Lay down drill pipe.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 20 ENDING DATE: 03/26/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/19/10	Day	JA	Run caliper log/gamma ray and prepare to run 24-inch casing.
03/19/10	Night	RAS	Prepare to run casing.
03/20/10	Day	JA	Start installing the 24-inch casing.
03/20/10	Night	RAS	Continue running the 24-inch casing.
03/21/10	Day	JA	Continue running the 24-inch casing.
03/21/10	Night	RAS	Continue running casing until a software problem stops activity.
03/22/10	Day	JA	Rig maintenance.
03/22/10	Night	RAS	Rig is inactive due to software problem.
03/23/10	Day	JA	Rig maintenance.
03/23/10	Night	RAS	Rig is inactive.
03/24/10	Day	JA	Finish running the casing.
03/24/10	Night	RAS	Conduct preliminary pressure test.
03/25/10	Day	JA	Start setting the casing with cement.
03/25/10	Night	RAS	Continue setting the casing with cement.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 21 ENDING DATE: 04/02/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
3/26/10	Day	D. Barnes	Cementing triple seal packer in place.
3/26/10	Night	R. Stross	Pump Cement Stage 1 of 24-inch casing.
3/27/10	Day	D. Barnes	Pump Cement Stage 2 of 24-inch casing.
3/27/10	Night	D. Legett	Pump Cement Stage 3 of 24-inch casing.
3/28/10	Day	D. Barnes	Pump Cement Stage 4 of 24-inch casing.
3/28/10	Night	D. Legett	Pump Cement Stage 5 of 24-inch casing.
3/29/10	Day	D. Barnes	Pump Cement Stages 6,7,8,and 9 of 24-inch casing.
3/29/10	Night	D. Legett	Pump Cement Stages 10 and 11 of 24-inch casing.
3/30/10	Day	D. Barnes	Pump Cement Stage 12 of 24-inch casing.
3/30/10	Night	D. Legett	Pump Cement Stage 13 of 24-inch casing.
3/31/10	Day	D. Barnes	Pump Cement Stage 14 of 24-inch casing.
3/31/10	Night	D. Legett	Pump Cement Stage 15 of 24-inch casing.
04/01/10	Day	D. Barnes	Wait for Cement Stage 15 to cure.
04/01/10	Night	D. Legett	Run Cement Bond Log, Pump Cement Stage 16 to surface.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 22 ENDING DATE: 04/09/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/02/10	Day	JA	Temp log of 24 inch casing grout.
4/02/10	Night	RS	Stand by.
4/03/10	Day	JA	Stand by.
4/03/10	Night	RS	Stand by.
4/04/10	Day	JA	Stand by.
4/04/10	Night	RS	Stand by.
4/05/10	Day	JA	Pressure test of 24-inch diameter injection casing performed and witnessed by FDEP.
4/05/10	Night	RS	Stand by.
4/06/10	Day	JA	Stand by.
4/06/10	Night	RS	Stand by.
4/07/10	Day	JA	Begin installing FRP.
4/07/10	Night	RS	Stand by.
4/08/10	Day	JA/MO	Finish installing FRP.
4/08/10	Night	RS	Stand by.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 23 ENDING DATE: 04/16/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/09/10	Day	MO	Complete installation of FRP casing.
4/09/10	Night	DL	No activity.
4/10/10	Day	MO	Develop well.
4/10/10	Night	DL	Develop well.
4/11/10	Day	MO	No activity.
4/11/10	Night	DL	No activity.
4/12/10	Day	MO	Develop well.
4/12/10	Night	DL	No activity.
4/13/10	Day	MO	Sample collection for primary and secondary drinking water standards and completed video log.
4/13/10	Night	DL	No activity.
4/14/10	Day	MO	No activity.
4/14/10	Night	DL	No activity.
4/15/10	Day	MO	No activity.
4/15/10	Night	DL	No activity.

WEEKLY CONSTRUCTION SUMMARY

WELL: IW-2

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 27 ENDING DATE: 05/14/2010

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DZMW-1

WEEKLY CONSTRUCTION SUMMARY

WELL: MW-1

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 20 ENDING DATE: 03/26/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
03/19/10	Day	JA	This well is inactive.
03/19/10	Night	RAS	This well is inactive.
03/20/10	Day	JA	This well is inactive.
03/20/10	Night	RAS	This well is inactive.
03/21/10	Day	JA	This well is inactive.
03/21/10	Night	RAS	This well is inactive.
03/22/10	Day	JA	This well is inactive.
03/22/10	Night	RAS	This well is inactive.
03/23/10	Day	JA	Rigging up on the well site.
03/23/10	Night	RAS	Rigging up on the well site.
03/24/10	Day	JA	Rigging up on the well site.
03/24/10	Night	RAS	Rigging up on the well site.
03/25/10	Day	JA	Rigging up on the well site.
03/25/10	Night	RAS	Rigging up on the well site.

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 21 ENDING DATE: 04/02/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
3/26/10	Day	D. Barnes	Begin drilling with 40.5 inch bit. Drill from 0 to 20 ft bpl.
3/26/10	Night	R. Stross	Drill 40.5 inch borehole from 20 to 35 ft bpl.
3/27/10	Day	D. Barnes	Drill 40.5 inch borehole from 35 to 76 ft bpl.
3/27/10	Night	D. Legett	Drill 40.5 inch borehole from 76 to 125 ft bpl.
3/28/10	Day	D. Barnes	Drill 40.5 inch borehole from 125 to TD of 161 ft bpl.
3/28/10	Night	D. Legett	Run caliper and gamma ray logs, cement 30-inch casing.
3/29/10	Day	D. Barnes	Run temperature log.
3/29/10	Night	D. Legett	Tie-in well head, trip in drill pipe with 28.5-inch bit.
3/30/10	Day	D. Barnes	Drill 28.5-inch borehole 161 to 240 ft bpl.
3/30/10	Night	D. Legett	Drill 28.5-inch borehole 240 to 385 ft bpl.
3/31/10	Day	D. Barnes	Drill 28.5-inch borehole 385 to 488 ft bpl.
3/31/10	Night	D. Legett	Drill 28.5-inch borehole 488 to 586 ft bpl.
4/01/10	Day	B. Barnes	Drill 28.5-inch borehole 586 to 686 ft bpl.
4/01/10	Night	D. Legett	Drill 28.5-inch borehole 686 to 780 ft bpl.

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 22 ENDING DATE: 04/09/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/02/10	Day	JA	Mud rotary drill from 780 to 848 ft bpl.
4/02/10	Night	RS	Mud rotary drill from 848 to 924 ft bpl.
4/03/10	Day	JA	Mud rotary drill from 924 to 978 ft bpl.
4/03/10	Night	RS	Mud rotary drill from 978 to 1014 ft bpl.
4/04/10	Day	JA	Mud rotary drill from 1014 to 1079 ft bpl.
4/04/10	Night	RS	Circulating mud in borehole to keep open to total depth
4/05/10	Day	JA	Continue borehole conditioning
4/05/10	Night	RS	Caliper log and dual induction log.
4/06/10	Day	JA	Begin 20 inch surface casing run.
4/06/10	Night	RS	Finish 20 inch surface casing run to 1075 ft bpl. Begin pressure grout.
4/07/10	Day	JA	Finish pressure grout to surface in one stage. Conduct temp log.
4/07/10	Night	RS	Trip in BHA to begin drilling 1075 to ~1900 ft bpl.
4/08/10	Day	JA/MO	Stand by.
4/08/10	Night	RS	Drill pilot hole to 1212 ft bpl.

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 23 ENDING DATE: 04/16/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/09/10	Day	MO	Drill 12.25-inch pilot hole 1212 to 1257 ft bpl.
4/09/10	Night	DL	Drill 12.25-inch pilot hole 1257 to 1520 ft bpl.
4/10/10	Day	MO	Drill 12.25-inch pilot hole 1520 to 1770 ft bpl.
4/10/10	Night	DL	Drill 12.25-inch pilot hole 1770 to 1940 ft bpl.
4/11/10	Day	MO	Geophysical logging from 1000 to 1940 ft bpl
4/11/10	Night	DL	Geophysical logging from 1000 to 1940 ft bpl.
4/12/10	Day	MO	Packer Test No 1 in interval from 1900 to 1940 ft bpl.
4/12/10	Night	DL	Packer Test No 1 in interval from 1900 to 1940 ft bpl.
4/13/10	Day	MO	Place 60 5-gal buckets of gravel in monitoring zone 1900 to 1940 ft bpl.
4/13/10	Night	DL	Ream 18.5-inch borehole from 1079 to 1167 ft bpl.
4/14/10	Day	MO	Ream 18.5-inch borehole from 1167 to 1382 ft bpl.
4/14/10	Night	DL	Ream 18.5-inch borehole from 1382 to 1566 ft bpl.
4/15/10	Day	MO	Ream 18.5-inch borehole from 1566 to 1748 ft bpl.
4/15/10	Night	DL	Ream 18.5-inch borehole from 1748 to 1900 ft bpl.

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 24 ENDING DATE: 04/23/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/16/10	Day	D. Barnes	Wiper trip. Trip out of hole.
4/16/10	Night	R. Stross	Run caliper and gamma ray logs on 18.5-inch diameter borehole to 1900 ft bpl
4/17/10	Day	D. Barnes	Run 12.75-inch diameter casing (Joints 1 - 26)
4/17/10	Night	R. Stross	Run 12.75-inch diameter casing (Joints 26 - 47)
4/18/10	Day	D. Barnes	Complete Cement Stage 1 of 12.75-inch diameter casing (54 bbls neat).
4/18/10	Night	R. Stross	Complete Cement Stage 2 of 12.75-inch diameter casing (100 bbls 6%).
4/19/10	Day	D. Barnes	Complete Cement Stage 3 of 12.75-inch diameter casing (100 bbls 6%).
4/19/10	Night	R. Stross	Complete Cement Stage 4 of 12.75-inch diameter casing (120 bbls 6%).
4/20/10	Day	D. Barnes	Complete Cement Stage 5 of 12.75-inch diameter casing (189 bbls 6%).
4/20/10	Night	R. Stross	Run temperature log.
4/21/10	Day	D. Barnes	Trip in with the 11-inch diameter bit.
4/21/10	Night	R. Stross	Drilled 11-inch diameter borehole to 2,000 feet bpl
4/22/10	Day	D. Barnes	Drilled 11-inch diameter borehole to 2,059 feet bpl
4/22/10	Night	R. Stross	Drilled 11-inch diameter borehole to 2,099 feet bpl

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

WEEK NO.: 25 ENDING DATE: 04/30/2010

DATE	SHIFT	OBSERVER	ACTIVITY SUMMARY
4/23/10	Day	D. Barnes	Drill 11-inch diameter borehole from 2,143 to 2,239 ft bpl.
4/23/10	Night	D. Legett	Drill 11-inch diameter borehole from 2,239 to 2,260 ft bpl.
4/24/10	Day	D. Barnes	Run geophysical logs on interval from 1,900 to 2,260 ft bpl.
4/24/10	Night	D. Legett	Trip in with packer. Begin air development phase of packer test 2.
4/25/10	Day	D. Barnes	Complete air development, pump development, background and start pump test phase of packer test 2.
4/25/10	Night	D. Legett	Complete pumping and recovery phase of packer test 2.
4/26/10	Day	D. Barnes	Tripping out with drill pipe from Packer Test 2. Tripping in with cement tubing for pressure test of 12-inch casing.
4/26/10	Night	D. Legett	Conduct preliminary pressure test of 12-inch casing,
4/27/10	Day	D. Barnes	Conduct final pressure test of 12-inch casing.
4/27/10	Night	D. Legett	Pull packer tool, wait on casing approval.
4/28/10	Day	D. Barnes	Wait on casing approval.
4/28/10	Night	D. Legett	Wait on casing approval.
4/29/10	Day	D. Barnes	Wait on casing approval.
4/29/10	Night	D. Legett	Wait on casing approval.

WEEKLY CONSTRUCTION SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

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SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

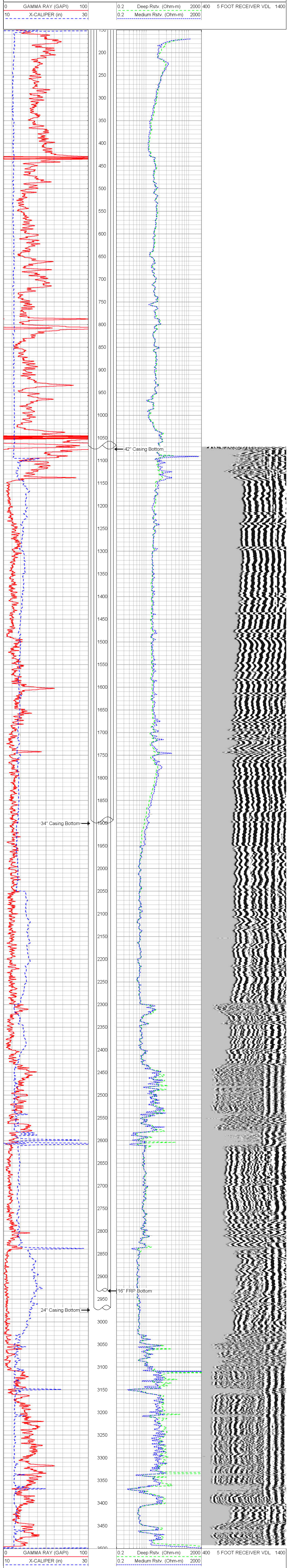
CONTRACTOR: YOUNGQUIST

WEEK NO.: 26 ENDING DATE: 05/07/2010

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Appendix D

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Presentation Format: merge
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Charted by: Depth in Feet scaled 1:900

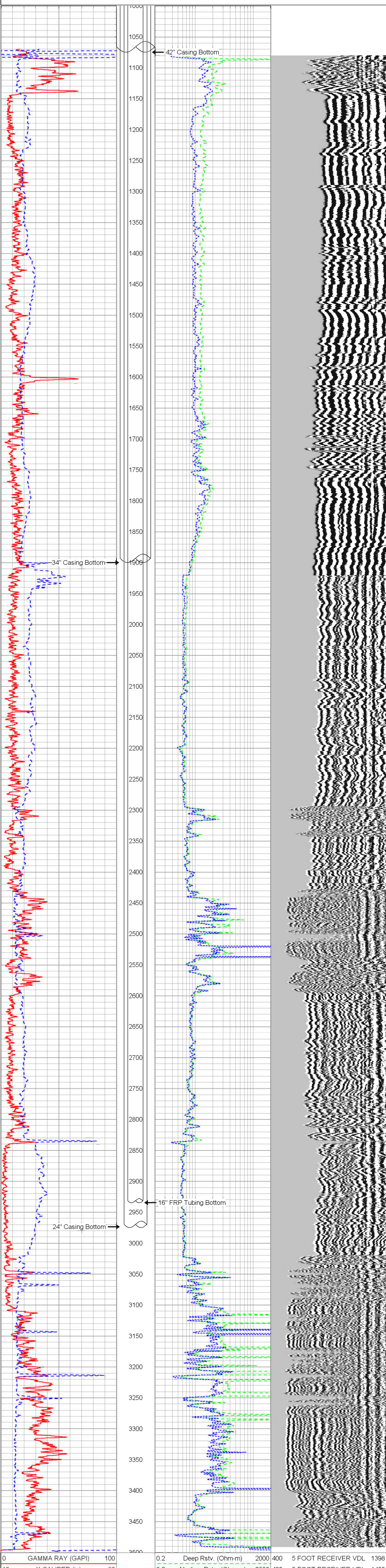




HIALEAH ROWTP IW-2

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Database File:      hiaiw2.db
Dataset Pathname:  FINAL/MERGE
Presentation Format: merge
Dataset Creation:  Fri Aug 06 10:24:13 2010
Charted by:        Depth in Feet scaled 1:900
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0	GAMMA RAY (GAPI)	100	0.2	Deep Rstv. (Ohm-m)	2000	400	5 FOOT RECEIVER VDL	1398
10	X-CALIPER (in)	30	0.2	Medium Rstv. (Ohm-m)	2000	400	5 FOOT RECEIVER VDL	1400



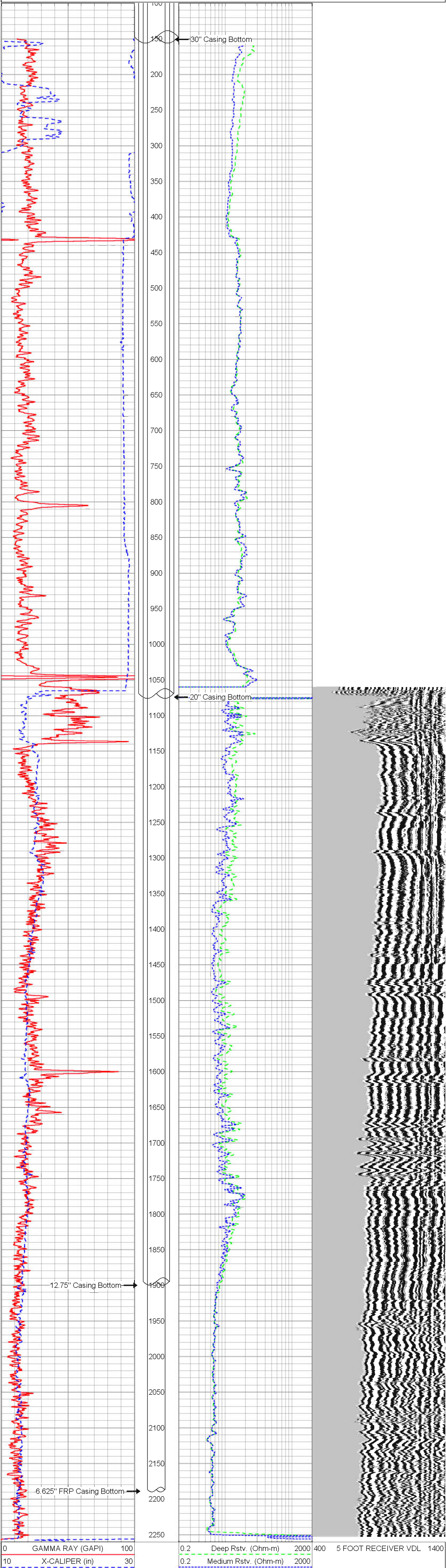
HIALEAH ROWTP DZMW-1

Database File:	hiamw1.db
Dataset Pathname:	MERGE/FINAL
Presentation Format:	merge
Dataset Creation:	Fri Aug 06 11:14:12 2010
Charted by:	Depth in Feet scaled 1:900

0	GAMMA RAY (GAPI)	100
10	X-CALIPER (in)	30

0.2	Deep Rstv. (Ohm-m)	2000
0.2	Medium Rstv. (Ohm-m)	2000

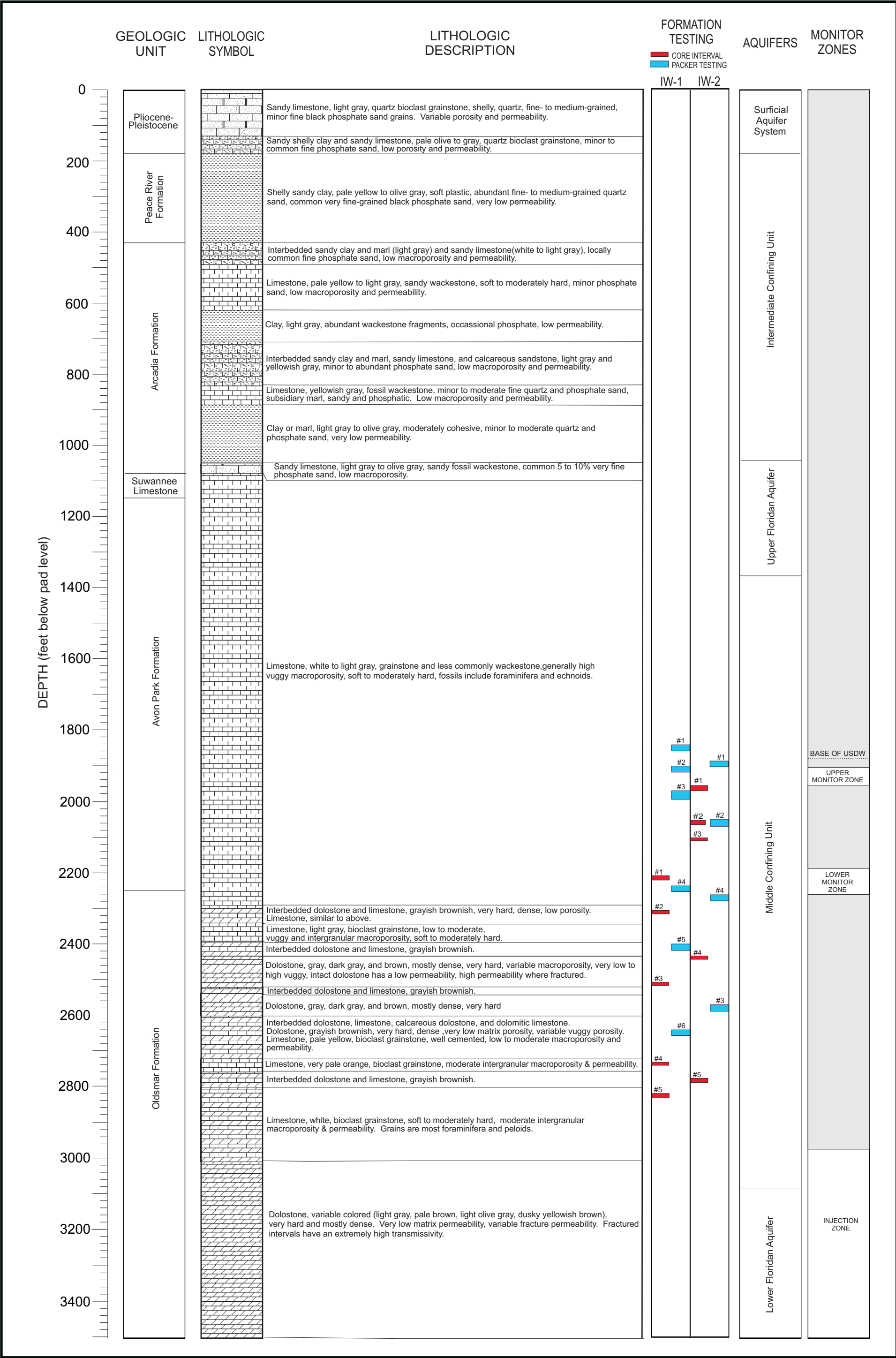
400	5 FOOT RECEIVER VDL	1400
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0	GAMMA RAY (GAPI)	100
10	X-CALIPER (in)	30

0.2	Deep Rstv. (Ohm-m)	2000
0.2	Medium Rstv. (Ohm-m)	2000

400	5 FOOT RECEIVER VDL	1400
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Appendix E

LITHOLOGIC LOG

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
0 - 10	SANDY LIMESTONE (100%): pinkish gray (5YR 7/2), hard, fine-grained shell fragments and subangular quartz with dense calcite cement. Low intergranular and moldic porosity. Fine, black phosphate grains are common.
10 - 20	SHELLY LIMESTONE (100%): pinkish white (5YR 8/2) hard, grainstone composed of fine to coarse shell fragments. Fine subangular quartz grains are common. Cement is dense to slightly chalky calcite. Good moldic and intergranular porosity. Few fine black phosphate grains.
20- 30	SHELLY LIMESTONE (100%): light gray (5YR 7/1) hard grainstone with fine to coarse shell fragments and abundant fine subangular quartz grains in dense calcite cement. Some moldic porosity. Few fine black phosphate grains.
30 - 40	SHELLY QUARTZ SANDSTONE (100%): light gray (5YR 7/1) very hard, fine subangular quartz with fine to coarse shell fragments and dense calcite cement. Low intergranular and moldic porosity. Some fine black phosphate grains.
40 - 50	Same as above.
50 - 60	SHELLY QUARTZ SANDSTONE (100%): light gray (5YR 7/1) hard, fine, subangular quartz with some fine to coarse shell fragments. Calcite cement is less dense than above. Low intergranular and moldic porosity. Some black to dark brown phosphate grains.
60 - 70	SHELLY QUARTZ SANDSTONE (100%): light gray (5YR 7/1) hard, fine to medium-grained subangular quartz with some fine to coarse shell fragments. Calcite cement is slightly chalky. Low intergranular and moldic porosity. Some black to dark brown phosphate grains.
70 - 80	SANDY LIMESTONE (100%): pale yellow (5Y 8/2), moderately hard, grainstone, fine grained subangular quartz with some shell fragments. More calcite cement than above. Some small blackish-brown phosphate grains, low intergranular and moldic macroporosity.
80 - 90	SANDY LIMESTONE (100%): white (5Y 8/1) hard grainstone, fine to coarse shell fragments and abundant fine to medium subangular quartz grains. Dense calcite cement. Low intergranular and moldic porosity. Fine black phosphate grains are rare.
90 - 100	SANDY LIMESTONE (100%): light gray (5Y 7/1) hard grainstone, fine to very coarse shell fragments and abundant fine to medium subangular quartz grains. Dense calcite cement. Low intergranular porosity, some moldic porosity. Some fine black and dark brown phosphate grains.
100 - 110	SANDY LIMESTONE (100%): light gray (5Y 7/1) hard grainstone, medium to coarse shell fragments and abundant medium to coarse subangular quartz grains. Chalky calcite cement. Some intergranular and moldic porosity. Some fine to medium black and dark brown phosphate grains.
110 - 120	Same as above.
120 - 130	SANDY LIMESTONE (75%): same as above. SHELLY SANDY CLAY (25%): pale olive (5Y 6/3) soft, slightly plastic, calcareous, with fine to medium subangular quartz grains and fine to coarse shell fragments. Fine black phosphate grains are common.

LITHOLOGIC LOG

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
130 - 140	SANDY SHELLY CLAY (100%) same as above.
140 - 150	SANDY SHELLY CLAY (25%) same as above. SHELLY SANDSTONE (75%) gray (5Y 6/1) hard, fine to medium grained quartz with abundant fine to very coarse shell fragments. Dense calcite cement. Low intergranular and moldic porosity. Fine black phosphate grains are common.
150 - 160	SANDY LIMESTONE (100%) gray (5Y 6/1) hard grainstone composed predominantly of fine to very coarse shell fragments and abundant fine to medium-grained subangular quartz. Dense calcite cement. Low intergranular porosity, some moldic porosity. Fine black phosphate grains are common.
160 - 170	SHELLY SANDSTONE (100%) pale yellow (5Y 7/3) hard, fine to medium grained subangular quartz and fine to coarse shell fragments in dense calcite cement. Low intergranular and moldic porosity. Some fine black phosphate grains. Note that sample contains mostly gray cement cuttings.
170 - 180	SHELLY SANDSTONE (50%) same as above. SHELLY SANDY CLAY (50%) gray (5Y 5/1) soft, loose, abundant fine quartz grains and fine to coarse shell fragments. Very fine black phosphate grains are common.
180 - 190	SHELLY SANDY CLAY (100%) same as above.
190 - 200	SHELLY SANDY CLAY (100%) same as above.
200 - 210	SHELLY SANDY CLAY (100%) same as above except slightly darker in color.
210 - 220	SANDY CLAY (100%) olive gray (5Y 4/2) soft, slightly plastic. Abundant fine grained quartz. Very fine black phosphate grains are common.
220 - 230	SHELLY SANDY CLAY (100%), olive gray (5Y 4/2), soft, loose, abundant fine grained quartz sand and fine to coarse grained shell fragments common, fine grained black phosphate grains also common.
230 - 240	SHELLY SANDY CLAY (100%), olive gray (5Y 4/2), soft, loose abundant fine grained quartz sand and fine to very coarse grained shell fragments, fine grained black phosphate also common.
240 - 250	SHELLY SANDY CLAY (100%), olive gray (5Y 4/2), soft, slightly plastic, abundant fine grained quartz sand and fine to coarse grained shell fragments, common fine black phosphate grains.
250 - 260	SHELLY SANDY CLAY (100%), same as above.
260 - 270	SANDY SHELLY CLAY/CLAYEY SHELLY SAND (100%), olive gray (5Y 4/2), soft, slightly cohesive, abundant fine to very fine quartz sand, 15-20% fine black phosphate grains, fine to very coarse bivalve shell fragments, low hydraulic conductivity.
270 - 280	SANDY CLAY (100%), dark greenish gray (GLE1 4/1), soft, less cohesive than above, abundant fine to very fine quartz sand, 15-20% very fine to fine phosphate grains, <5% shell fragments, low hydraulic conductivity.
280 - 290	SANDY CLAY (100%), as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
290 - 300 continued	cohesive than above, some whitish clay too (<10%) in lenses; overall low hydraulic conductivity.
300 - 310	SANDY CLAY (100%), greenish gray to dark greenish gray (GLE Y1 4.5/1), abundant fine grained quartz sand, less sandy (more clay-rich) than above, soft, slightly cohesive, abundant fine grained phosphate, trace of fine grained shell fragments, low hydraulic conductivity.
310 - 320	SANDY CLAY, (100%), greenish gray to dark greenish gray (GLE Y1 4.5/1), abundant fine to very fine grained quartz sand, soft, slightly cohesive, common fine grained phosphate, 5-10% shell fragments—fine to very coarse.
320 - 330	SANDY CLAY (100%), similar to above, except less shell fragments - only trace amount (<5% fine grained shell fragments), some sandier lenses - white to grayish (2.5Y 6/1), fine grained quartz sand
330 - 340	SANDY CLAY/CLAYEY SAND (100%), greenish gray to dark greenish gray (GLE Y1 4.5/1), soft, slightly cohesive, abundant fine to very fine grained quartz sand, 5-10% very fine grained phosphate, lenses of gray (GLE Y 5/1) clayey sand, cohesive, sot, low hydraulic conductivity.
340 - 350	SILTY TO SANDY CLAY (100%), dark greenish gray to greenish gray (GLE Y1 4.5/1), less sandy, more clay-rich than above, soft, less cohesive than above, 10% phosphate - fine sand to very fine sand size grains, 5% fine shell fragments.
350 - 360	CLAYEY SAND/SANDY CLAY (100%), dark greenish gray to greenish gray (GLE Y1 4.5/1), contains fine to very fine quartz sand, 5% fine to very fine grained phosphate, soft, slightly cohesive, <5% shell fragments - fine to coarse grained, moderately low hydraulic conductivity.
360 - 370	SILTY CLAY (100%), dark greenish gray (5Y 4/1), stiffer, more cohesive than above, abundant fine to very fine grained quartz sand and silt, 10-15% fine to very fine grained phosphate, some lenses of whitish gray sandy clay, overall low hydraulic conductivity.
370 - 380	SILTY CLAY (100%), as above.
380 - 390	CLAYEY SAND to SANDY CLAY (100%), very sandy, soft to slightly cohesive, 5-10% shell fragments, moderately low hydraulic conductivity, 10% fine to very fine grained phosphate, low hydraulic conductivity.
390 - 400	CLAYEY SAND to SANDY CLAY (100%), as above.
400 - 410	SANDY CLAY (100%), olive gray (5Y 4/2), sandy, very fine to fine grained quartz sand, soft, slightly cohesive, 5-10% phosphate grains, sponge spicules present, low hydraulic conductivity.
410 - 420	SLIGHTLY SANDY CLAY (100%), olive gray to dark olive gray (5Y 3.5/2), similar to above-except appears to be stiffening with depth, silty to sandy, very fine to fine, low hydraulic conductivity.
420 - 430	SANDY CLAY (100%), olive gray to dark olive gray (5Y 3.5/2), similar to above, except stiffer/more cohesive, sponge spicules noted, very fine grained phosphate common, low hydraulic conductivity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
430 - 440	SANDY CLAY, dark gray (5Y 4/1), softer than above, abundant fine to very fine grained quartz sand, 5-10% phosphate grains- very fine, low hydraulic conductivity.
440 - 450	SANDY CLAY (60%), dark gray (5Y 4/1), as above. LIMESTONE (40%), white to light gray (5Y 6/1), moderately hard to soft, coarse sand-size fragments, low macroporosity.
450 - 460	Heterogeneous of mix of sandy clay and subsidiary amounts of limestone and marl. SANDY CLAY, olive gray (5Y 5/2), silty to fine sandy, 10-15% fine grained phosphate. LIMESTONE, white to light gray (5Y 6/1), as above. MARL, white to light gray (5Y 7.5/1), soft.
460 - 470	NO SAMPLE - sample not collected by mistake? Missing both sets of this interval.
470 - 480	Heterogeneous of mix of sandy clay and subsidiary amounts of limestone and marl. SANDY CLAY, light gray (5Y 5/1), silty to fine sandy, 10-15% fine grained phosphate. LIMESTONE, white to light gray (5Y 6/1), as above. MARL, white to light gray (5Y 7.5/1), soft.
480 - 490	LIMESTONE (80%), light gray (5Y 7/2), soft to moderately hard, common shell fragments, low apparent macroporosity. CLAY/MARL (20%), olive gray (5Y 4/2) and light gray (5Y 7/2), soft.
490 - 500	LIMESTONE (100%), light gray (5Y 7/2), soft friable, minor sand-size phosphate, mollusk fragments, low macroporosity.
500 - 510	LIMESTONE (100%), pale yellow and light gray (5Y 8/2) and (5Y 7/2), soft to moderately hard, sandy wackestone, mollusk fragments, low macroporosity.
510 - 520	LIMESTONE (100%), pale yellow (5Y 8/2), light gray (5Y 7/2), and gray (5Y 5/1), soft, sandy wackestone, mollusk fragments, low macroporosity, trace of medium to very coarse sand size phosphate.
520 - 530	LIMESTONE (100%), as above.
530 - 540	LIMESTONE (100%), as above.
540 - 550	LIMESTONE (100%), as above.
550 - 560	LIMESTONE (100%), as above.
560 - 570	LIMESTONE (100%), pale yellow (5Y 8/2) and light gray (5Y 7/2), soft, sandy wackestone, mollusk fragments, low macroporosity.
570 - 580	LIMESTONE (100%), as above.
580 - 590	LIMESTONE (100%), pale yellow (5Y 8/2) and gray (5Y 6/1), soft to moderately hard, sandy wackestone, mollusk fragments, low macroporosity.
590 - 600	LIMESTONE (100%), as above.
600 - 610	LIMESTONE (100%), as above.
610 - 620	LIMESTONE (100%), as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
620 - 630	CLAYEY LIMESTONE (100%), light gray (5Y 7/2), friable, wackestone, mollusks/fragments, trace of silt size phosphate.
630 - 640	CLAY (100%), light gray (5Y 7/2), sticky, abundant limestone fragments, as above, trace of silt-size phosphate.
640 - 650	CLAY (100%), as above.
650 - 660	CLAY (100%), as above.
660 - 670	CLAY (100%), light gray (5Y 7/2), soft, trace of medium sand size phosphate grains, abundant soft mudstone and wackestone fragments.
670 - 680	CLAY (100%), as above.
680 - 690	CLAY (100%), as above.
690 - 700	CLAY (100%), as above.
700 - 710	CLAY (100%), as above.
710 - 720	LIMESTONE (100%), light gray (5Y 7/2), soft, wackestone and mudstone, mollusk fragments, minor clay, as above, low macroporosity and apparent permeability.
720 - 730	LIMESTONE (100%), as above.
730 - 740	LIMESTONE (100%), as above.
740 - 750	LIMESTONE (100%), as above.
750 - 760	LIMESTONE (100%), light gray (5Y 7/2), wackestone, soft, mollusk fragments, minor soft clay.
760 - 770	CLAY (100%), light gray (5Y 7/2), soft, abundant wackestone fragments, mollusks, occasional phosphate nodules.
770 - 780	CLAY, as above.
780 - 790	CLAY, as above.
790 - 800	CLAY, as above.
800 - 810	CLAY, as above.
810 - 820	CLAY, light gray (5Y 7/2), sandy, very fine to silty quartz sand, 15% phosphate and other heavy mineral grains, 10% coarse to very coarse sand size shell fragments (white). VERY SANDY LIMESTONE/CALCAREOUS SANDSTONE, light gray (5Y 7/2), moderately hard, very sand wackestone, phosphatic, low moldic macroporosity (external bivalve molds).
820 - 830	MARL, light gray (5Y 7/2), heterogeneous mix of clay, lime mud, and shell fragments; abundant fine to medium sand size phosphate and other heavy mineral grains; LIMESTONE, light gray (5Y 7/2), wackestone, soft, micritic texture, trace phosphate grains, low intergranular macroporosity, much of limestone likely pulverized due to softness.
830 - 840	LIMESTONE (100%), yellowish gray (5Y 7/2), wackestone, moderately hard to soft, trace (<5%) phosphate and other heavy minerals, low intergranular macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
840 - 850	LIMESTONE (100%), yellowish gray (5Y 7/2), wackestone, moderately hard, trace phosphate and other heavy minerals, low intergranular macroporosity, 5% loose calcitic shell fragments and trace calcareous microfossils (foraminifera).
850 - 860	LIMESTONE (100%), yellowish gray (5Y 7/2), wackestone, moderately hard - slightly harder than above (slightly less pulverized), trace (<5%) fine grained quartz sand, 1-2% phosphate and other heavy mineral grains, <5% loose calcitic shell fragments and calcareous microfossils, low intergranular macroporosity.
860 - 870	MARL (60%), yellowish gray (5Y 7/2), sandy, clayey, 10% fine grained phosphate and other heavy minerals, 10-15% calcitic shell fragments and microfossils, lenses of greenish gray (GLEY 5/1), silty clay. LIMESTONE (40%), as above in 840 to 850 ft bpl.
870 - 880	LIMESTONE (100%), pale yellow (5Y 8/2), moderately hard, wackestone, trace (1-3%) phosphate and other heavy minerals, 5-10% calcitic shell fragments, low to moderately low moldic macroporosity; trace of marl, as above.
880 - 890	LIMESTONE (100%), white (5Y 8/1), moderately hard, wackestone, <1% phosphate and other heavy minerals, low to moderately low moldic macroporosity; trace marl, from above?
890 - 900	MARL (100%), light gray (5Y 7/2), shelly and sandy - fine sand size quartz grains, trace (<5%) fine sand-size phosphate.
900 - 910	SANDY CLAY (100%), light gray to light olive gray (5Y 6.5/2), sticky, cohesive, 25-30% fine to very fine grained quartz sand, silty, 10% silt to very fine sand size phosphate, <5% fine sand size calcitic shell fragments.
910 - 920	CLAY, as above with subsidiary LIMESTONE, wackestone, pale yellow (5Y 8/2), soft, medium to coarse sand size limestone fragments.
920 - 930	CLAY, light gray (5Y 7/1), stiff, cohesive, 10% fine quartz sand, <5% fine to medium sand size phosphate and other heavy mineral grains, trace (few %) calcitic shell fragments, low hydraulic conductivity.
930 - 940	MARL, light gray (5Y 7/1), heterogeneous mixture of clay and lime mud, slightly cohesive, sandy, 10-15% phosphate grains; LIMESTONE, pale yellow (5Y 8/2), wackestone, soft to moderately hard, medium sand-size rock fragments, overall low hydraulic conductivity.
940 - 950	MARLY CLAY, light gray (5Y 7/1), slightly cohesive, sandy, trace of silt-size phosphate, abundant wackestone and bivalve fragments.
950 - 960	MARLY CLAY, light olive gray (5Y 6/2), moderately cohesive, 5% silt-size to very fine sand-size phosphate grains, 5% fine sub-angular quartz grains, minor limestone fragments.
960 - 970	MARL/CLAY, olive gray (5Y 5/2), moderately cohesive, silt to very fine-sand size phosphate grains, 5% very fine quartz sand, occasional stiff dark olive gray (5Y 3/2) clay lumps.
970 - 980	MARLY CLAY, pale yellow (5Y 8/2), slightly cohesive, trace of silt-size phosphate, 5% stiff dry dark olive gray (5Y 3/2) clay.

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980 - 990	MARLY CLAY, pale yellow (5Y 8/2), pale yellow, moderately cohesive, trace of silt-size phosphate.
990 - 1000	MARLY CLAY, as above.
1000 - 1010	MARLY CLAY, light olive gray (5Y 6/2), moderately cohesive, minor limestone fragments.
1010 - 1020	MARLY CLAY, as above.
1020 - 1030	MARLY CLAY, pale yellow (5Y 7/3), pale yellow, moderately stiff, clean.
1030 - 1040	MARLY CLAY, light olive gray (5Y 6/2), light olive gray, moderately cohesive, minor bivalve fragments.
1040 - 1050	MARLY CLAY, light gray (5Y 7/2), light gray, sandy - 10% quartz and phosphate grains-medium and size.
1050 - 1060	LIMESTONE, light gray (5Y 7/2), sandy fossil wackestone, moderately hard, 5% silt-size phosphate, low macroporosity.
1060 - 1070	SANDY LIMESTONE, light olive gray (5Y 6/2), moderately hard, low macroporosity, 5% very fine sand size phosphate grains, 5% quartz sand, low apparent permeability.
1070 - 1080	SANDY LIMESTONE, light gray (5Y 7/2), hard, low macroporosity, low apparent permeability, wackestone, 5% very fine sand size phosphate, 5% quartz sand
1080 - 1090	LIMESTONE, light gray (5Y 7/1), mudstone/wackestone, moderately hard to hard, low apparent permeability, low macroporosity, a lot of bentonite in sample bag.
1090 - 1100	LIMESTONE, light gray (5Y 7/1), mudstone, moderately hard to hard, low macroporosity, low apparent permeability, a lot of bentonite in sample bag.
1100 - 1110	LIMESTONE, pale yellow (5Y 8/2), grainstone, moderately hard to soft, moderate intergranular macroporosity, peloids, sand, gastropods, bivalves, forams.
1110 - 1120	LIMESTONE, pale yellow (5Y 8/2), grainstone, moderately hard to soft, moderate intergranular macroporosity, peloids, sand, gastropods, bivalves, forams.
1120 - 1130	DOLOMITE, gray (5Y 5/1), hard, medium crystalline, moderate vuggy macroporosity.
1130 - 1140	LIMESTONE, white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.
1140 - 1150	LIMESTONE, white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.
1150 - 1160	LIMESTONE, white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.
1160 - 1170	LIMESTONE, white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids. LIMESTONE (35%), gray (10YR 6/1), wackestone, moderately hard to hard, high vuggy macroporosity, peloids, mollusk fragments.
1170 - 1180	LIMESTONE (60%), gray (10YR 6/1), wackestone, moderately hard to hard, high vuggy macroporosity, peloids, mollusk fragments.
	LIMESTONE (40%), white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1180 - 1190	LIMESTONE, very pale brown (10YR 7/3), grainstone, soft, moderate intergranular macroporosity, peloids.
1190 - 1200	LIMESTONE, white (5Y 8/1), wackestone, hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1200 - 1210	LIMESTONE, white (5Y 8/1), wackestone, hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1210 - 1220	LIMESTONE, white (5Y 8/1), wackestone, soft, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1220 - 1230	LIMESTONE, white (5Y 8/1), wackestone, soft, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1230 - 1240	LIMESTONE, white (5Y 8/1), wackestone, soft, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1240 - 1250	LIMESTONE, reddish yellow (7.5YR 6/6), wackestone, soft to moderately hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1250 - 1260	LIMESTONE, reddish yellow (7.5YR 6/6), wackestone, soft to moderately hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1260 - 1270	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1270 - 1280	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1280 - 1290	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1290 - 1300	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1300 - 1310	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1310 - 1320	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1320 - 1330	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1330 - 1340	LIMESTONE, strong brown (7.5YR 5/6), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1340 - 1350	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1350 - 1360	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1360 - 1370	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1370 - 1380	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to

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	wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1380 - 1390	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1390 - 1400	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1400 - 1410	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1410 - 1420	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1420 - 1430	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1430 - 1440	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1440 - 1450	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1450 - 1460	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1460 - 1470	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1470 - 1480	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1480 - 1490	LIMESTONE (50%), strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods. LIMESTONE (50%), pale yellow (2.5Y 8/2), wackestone, hard, high vuggy and moldic macroporosity, peloids, mollusks.
1490 - 1500	LIMESTONE (80%), strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods. LIMESTONE (20%), pale yellow (2.5Y 8/2), wackestone, hard, high vuggy and moldic macroporosity, peloids, mollusks.
1500 - 1510	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy macroporosity, peloids.
1510 - 1520	LIMESTONE, very pale brown (10YR 8/3), mudstone, soft, very low vuggy macroporosity, silt.
1520 - 1530	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1530 - 1540	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1540 - 1550	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, low vuggy macroporosity, peloids, silt.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1550 - 1560	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, low vuggy macroporosity, peloids, silt.
1560 - 1570	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, low vuggy macroporosity, peloids, silt.
1570 - 1580	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, low vuggy macroporosity, peloids, silt.
1580 - 1590	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), wackestone, hard, moderate to high vuggy macroporosity, peloids, forams, mollusks.
1590 - 1600	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), wackestone, hard, moderate to high vuggy macroporosity, peloids, forams, mollusks.
1600 - 1610	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), wackestone, hard, moderate to high vuggy macroporosity, peloids, forams, mollusks.
1610 - 1620	LIMESTONE, very pale brown (10YR 7/3) to gray (10YR 6/1), wackestone, hard, moderate to high vuggy macroporosity, peloids, forams, mollusks.
1620 - 1630	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), wackestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1630 - 1640	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), wackestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1640 - 1650	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), wackestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1650 - 1660	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), wackestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1660 - 1670	LIMESTONE, pale brown (10YR 6/3), wackestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1670 - 1680	LIMESTONE (90%), light gray (10YR 7/2), wackestone, hard, high to very high vuggy macroporosity, mollusks. The driller reported that the well started to make more water at about this depth.
1680 - 1690	LIMESTONE, light gray (10YR 7/2), wackestone, hard, high to very high vuggy macroporosity, mollusks.
1690 - 1700	LIMESTONE, gray (GLE Y1 5/1), wackestone, hard, very high vuggy macroporosity, peloids; reacts strongly with dilute HCl, but has a slightly sucrosic texture, may be partially dolomitized.
1700 - 1710	LIMESTONE, light gray (GLE Y1 5/1), wackestone, hard, very high vuggy macroporosity, peloids, slightly sucrosic texture.
1710 - 1720	LIMESTONE, light gray (GLE Y1 5/1), wackestone, hard, very high vuggy macroporosity, peloids, slightly sucrosic texture.
1720 - 1730	LIMESTONE, light gray (GLE Y1 5/1), wackestone, hard, very high vuggy macroporosity, peloids, slightly sucrosic texture.
1730 - 1740	LIMESTONE, light gray (GLE Y1 5/1), wackestone, hard, very high vuggy macroporosity, peloids, slightly sucrosic texture.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1740 - 1750	LIMESTONE, white (GLEY1 8/1) to dark gray (GLEY1 4/1), wackestone, hard, moderate vuggy macroporosity, peloids.
1750 - 1760	LIMESTONE, white (GLEY1 8/1) to dark gray (GLEY1 4/1), wackestone, hard, moderate vuggy macroporosity, peloids.
1760 - 1770	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1770 - 1780	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1780 - 1790	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1790 - 1800	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1800 - 1810	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1810 - 1820	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1820 - 1830	LIMESTONE, pink (7.5YR 7/3), grainstone to wackestone, soft, low intergranular macroporosity, peloids, silt.
1830 - 1840	LIMESTONE (100%) pinkish gray (7.5YR 7/2) friable, fine to coarse grainstone with good intergranular and moldic porosity. Some very fine black phosphate grains.
1840 - 1850	LIMESTONE (100%) as above.
1850 - 1860	LIMESTONE (100%) as above.
1860 - 1870	LIMESTONE (100%) as above.
1870 - 1880	LIMESTONE (100%) as above.
1880 - 1890	LIMESTONE (100%) as above.
1890 - 1900	LIMESTONE (100%) as above.
1900 - 1910	LIMESTONE (100%) as above.
1910 - 1920	LIMESTONE (100%) as above.
1920 - 1930	LIMESTONE (100%) as above.
1930 - 1940	LIMESTONE (50%) pinkish gray rock as above. LIMESTONE (50%) white (off chart) friable chalky wackestone. Good moldic porosity where there were fossil shells.
1940 - 1950	LIMESTONE (80%) pinkish gray rock as above. LIMESTONE (20%) white rock as above.
1950 - 1960	LIMESTONE (100%) gray (5YR 6/1) to pinkish gray (5YR 7/2) moderately friable, fine to medium grainstone with good moldic porosity.
1960 - 1970	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) gray (2.5Y 6/1) hard, fine-grained grainstone with good moldic porosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1970 - 1980	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) gray rock as above.
1980 - 1990	LIMESTONE (100%) light gray (2.5Y 7/1) moderately friable, fine to medium grained grainstone with good moldic porosity.
1990 - 2000	LIMESTONE (100%) light gray rock as above.
2000 - 2010	LIMESTONE (100%) light gray rock as above.
2010 - 2020	LIMESTONE (100%) light gray rock as above.
2020 - 2030	LIMESTONE (100%) light gray rock as above.
2030 - 2040	LIMESTONE (100%) very pale brown (10YR 8/2) to light gray (10YR 7/1) moderately friable fine to medium grained grainstone with good moldic porosity.
2040 - 2050	LIMESTONE (100%) as above.
2050 - 2060	LIMESTONE (100%) as above.
2060 - 2070	LIMESTONE (100%) as above.
2070 - 2080	LIMESTONE (50%) pale brown rock as above. LIMESTONE (50%) gray (10YR 6/1) hard, recrystallized, fine-grained, conchoidal fracture, some moldic porosity.
2080 - 2090	LIMESTONE (50%) pale brown rock as above. LIMESTONE (50%) hard gray rock as above.
2090 - 2100	LIMESTONE (80%) pale brown rock as above. LIMESTONE (20%) hard gray rock as above.
2100 - 2110	LIMESTONE (100%) light gray (10YR 7/1) moderately friable fine-grained packstone with good intergranular and moldic porosity.
2110 - 2120	LIMESTONE (100%) as above.
2120 - 2130	LIMESTONE (100%) light gray (7.5YR 7/1) slightly friable, fine to medium-grained grainstone with good intergranular and moldic porosity.
2130 - 2150	LIMESTONE (100%) as above.
2150 - 2160	LIMESTONE (100%) white (10YR 8/1) to light gray (10YR 7/1) slightly friable, medium to coarse grainstone with some intergranular and moldic macroporosity.
2160 - 2170	LIMESTONE (100%) as above.
2170 - 2180	LIMESTONE (100%) as above.
2180 - 2190	LIMESTONE (100%) as above.
2190 - 2200	LIMESTONE (100%) as above.
2200 - 2210	LIMESTONE (80%) light brownish gray (10YR 6/2) moderately hard, medium to coarse grainstone with low intergranular and moldic macroporosity. LIMESTONE (20%) very pale brown (10R 7/3) moderately hard, medium grainstone with some intergranular and moldic macroporosity.
2210 - 2220	LIMESTONE (80%) light brownish gray rock as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	LIMESTONE (20%) very pale brown rock as above.
2220 - 2230	LIMESTONE (80%) light brownish gray rock as above. LIMESTONE (20%) very pale brown rock as above.
2230 - 2240	LIMESTONE (90%) very pale brown (10YR 7/3) moderately hard, fine to medium grainstone with some intergranular and moldic macroporosity. LIMESTONE (10%) white (offscale) soft mudstone or chalk. Very low macroporosity.
2240 - 2250	LIMESTONE (50%) very pale brown rock as above. LIMESTONE (50%) white chalk as above.
2250 - 2260	LIMESTONE (50%) white (10YR 8/1) slightly friable, fine-grained wackestone. Low intergranular macroporosity. LIMESTONE (50%) light gray (10YR 7/2) moderately hard, medium to coarse grainstone with good intergranular and moldic macroporosity.
2260 - 2270	LIMESTONE (50%) white wackestone as above. LIMESTONE (50%) light gray rock as above.
2270 - 2280	LIMESTONE (40%) white wackestone as above. LIMESTONE (60%) light gray rock as above.
2280 - 2290	LIMESTONE (40%) white wackestone as above. LIMESTONE (60%) light gray rock as above.
2290 - 2300	DOLOMITIC LIMESTONE (10%) light gray (10YR 7/2) hard, recrystallized, conchoidal fracture, no intergranular, and rare vuggy macroporosity. DOLOSTONE (90%) brown (10YR 5/3) very hard, crystalline, conchoidal fracture, sucrosic texture, low intergranular and vuggy macroporosity.
2300 - 2310	DOLOSTONE (100%) grayish brown (10YR 5/2) very hard, poor conchoidal fracture sucrosic texture, low intergranular but good vuggy macroporosity.
2310 - 2320	DOLOSTONE (75%) grayish brown rock as above. LIMESTONE (25%) pinkish gray (7.5 R 6/2) slightly friable medium to coarse grainstone, some intergranular and moldic macroporosity.
2320 - 2330	DOLOSTONE (25%) grayish brown rock as above. LIMESTONE (75%) pinkish gray rock as above.
2330 - 2340	DOLOSTONE (50%) grayish brown rock as above. LIMESTONE (50%) pinkish gray rock as above.
2340 - 2350	LIMESTONE (60%) light gray (10YR 7/2) slightly friable medium grainstone with some intergranular and moldic macroporosity. LIMESTONE (40%) light gray (10YR 7/1) moderately hard coarse grainstone with low intergranular but good moldic and vuggy macroporosity.
2350 - 2360	LIMESTONE (60%) medium grainstone as above. LIMESTONE (40%) coarse grainstone as above.
2360 - 2370	As above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
2370 - 2380	As above.
2380 - 2390	As above.
2390 - 2400	LIMESTONE (50%) medium grainstone as above. LIMESTONE (25%) coarse grainstone as above. DOLOSTONE (25%) Dark grayish brown (10YR 4/2) very hard, irregular fracture, vuggy macroporosity.
2400 - 2410	LIMESTONE (60%) medium grainstone as above. LIMESTONE (30%) coarse grainstone as above. DOLOSTONE (10%) dark grayish brown rock as above.
2410 - 2420	LIMESTONE (40%) medium grainstone as above. LIMESTONE (40%) coarse grainstone as above. DOLOSTONE (20%) dark grayish brown rock as above.
2420 - 2430	LIMESTONE (60%) medium grainstone as above. LIMESTONE (30%) coarse grainstone as above. DOLOSTONE (10%) dark grayish brown rock as above.
2430 - 2440	DOLOSTONE (40%) brown (7.5YR 4/2) very hard, irregular to poor conchoidal fracture, sucrosic texture, vuggy macroporosity. DOLOSTONE (60%) gray (10YR 6/1) very hard and dense, poor conchoidal fracture, fine sucrosic texture, very low intergranular and vuggy macroporosity.
2440 - 2450	DOLOSTONE (60%) brown rock as above. DOLOSTONE (40%) gray rock as above.
2450 - 2460	DOLOSTONE (30%) brown rock as above. DOLOSTONE (40%) gray rock as above. DOLOSTONE (30%) black (5Y2.5/1) very hard, poor conchoidal fracture, sucrosic texture, some vuggy macroporosity.
2460 - 2270	DOLOSTONE (70%) brown (7.5YR 4/2) very hard, irregular to poor conchoidal fracture, sucrosic texture, vuggy macroporosity. DOLOSTONE (30%) gray (10YR 6/1) very hard and dense, poor conchoidal fracture, fine sucrosic texture, very low intergranular and vuggy macroporosity.
2270 - 2280	DOLOSTONE (60%) pale brown (10YR 6/3) hard, irregular fracture, coarse sucrosic texture, high vuggy macroporosity. DOLOSTONE (40%) dark grayish brown (10YR 4/2) very hard and dense, poor conchoidal fracture, fine sucrosic texture, low vuggy macroporosity,
2280 - 2290	As above.
2490 - 2500	DOLOSTONE (75%) dark grayish brown (10YR 4/2) slightly friable, irregular fracture, good intergranular macroporosity. DOLOSTONE (25%) gray (10YR 6/1) very hard and dense, good conchoidal fracture, very low macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
2500 - 2510	DOLOSTONE (75%) gray (10YR 5/1) very hard and dense, poor conchoidal fracture, fine sucrosic texture, some brecciation and fracturing DOLOSTONE (25%) dark gray (10YR 4/1) hard and dense, irregular to poor conchoidal fracture, medium to coarse sucrosic texture, some vuggy macroporosity.
2510 - 2520	DOLOSTONE (75%) dark grayish brown (10YR 4/2) hard and dense, poor conchoidal fracture, sucrosic texture, some vuggy macroporosity. DOLOSTONE (25%) gray rock as above.
2520 - 2530	DOLOSTONE (100%) brown (10YR 5/3) to gray (10YR 5/1) hard, very finely crystalline, low to very low vuggy macroporosity.
2530 - 2540	DOLOSTONE (90%) greenish black (10YR 2.5/1) hard, finely crystalline, low vuggy macroporosity. LIMESTONE (10%) white (5y 8/1) moderately hard wackestone, vuggy macroporosity, peloids, black dolomite crystals.
2540 - 2550	LIMESTONE (50%) white (5Y 8/1) moderately hard grainstone, low intergranular macroporosity, peloids. DOLOSTONE (50%) pale olive (5Y 6/3 to olive (5Y 4/3) hard, fine to medium crystalline, low vuggy macroporosity.
2550 - 2560	LIMESTONE (20%) as above. DOLOSTONE (80%) as above.
2560 - 2570	DOLOSTONE (60%) brown (7.5YR 5/2) very hard, irregular to poor conchoidal fracture, fine sucrosic texture, some vuggy macroporosity. DOLOSTONE (40%) gray (2.5Y 6/1) very hard, microcrystalline, poor conchoidal fracture, some vuggy macroporosity.
2570 - 2580	DOLOSTONE (10%) brown rock as above. DOLOSTONE (30%) gray rock as above. DOLOSTONE (30%) dark gray (10YR 4/1) very hard, irregular fracture, medium sucrosic texture, vuggy macroporosity common. DOLOSTONE (30%) white (7.5YR 8/1) very hard, irregular to poor conchoidal fracture, microcrystalline, some vuggy macroporosity.
2580 - 2590	DOLOMITIC LIMESTONE (60%) hard, partially recrystallized grainstone with good intergranular and vuggy macroporosity. DOLOSTONE (40%) brown (7.5YR 5/3) hard, irregular fracture, medium to coarse sucrosic texture, some intergranular and vuggy macroporosity.
2590 - 2600	DOLOSTONE (100%) light brownish gray (10YR 6/3) very hard, irregular fracture, fine sucrosic texture, some vuggy macroporosity.
2600 - 2610	DOLOSTONE (75%) brown (10YR 5/3) very hard and dense, irregular fracture, fine sucrosic texture, some vuggy macroporosity. LIMESTONE (25%) very pale brown (10YR 7/3) hard to slightly friable grainstone with good intergranular and moldic macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
2610 - 2620	LIMESTONE (100%) very pale brown rock as above.
2620 - 2630	LIMESTONE (95%) very pale brown rock as above. DOLOSTONE (5%) brown (10YR 5/3) very hard, irregular fracture, coarse sucrosic texture, good vuggy macroporosity.
2630 - 2640	Same as above.
2640 - 2650	LIMESTONE (90%) hard, coarse grainstone, good intergranular and vuggy macroporosity. DOLOSTONE (10%) brown rock as above.
2650 - 2660	LIMESTONE, pale yellow (5Y 8/2), bioclast grainstone, moderately hard, well-cemented. Moderate to high (~ 20%) porosity, mostly intergranular, low to moderate permeability. Fossils include small foraminifera and echinoids. Some pieces of crystalline calcite, which may be neomorphosed shell.
2660 - 2670	CALCAREOUS DOLOMITE, much finer cuttings than above. Pale yellow (5Y 7/3 to 8/2), generally soft, very poorly cemented material that contains abundant disaggregated dolomite rhombs. Better lithified cuttings are mostly dolomite or limestone (similar to above). Probable moderate porosity and permeability.
2670 - 2680	LIMESTONE and DOLOMITIC LIMESTONE, pale yellow (5Y 8/3 to 7/2). Bioclast grainstone of variable hardness. Cutting sample includes well lithified fragments and disaggregated material (bioclasts and less common dolomite rhombs). Overall probably low to moderate macroporosity and permeability. Common foraminifera and apparently some small echinoids.
2680 - 2690	LIMESTONE and DOLOMITIC LIMESTONE, sand as above
2690 - 2700	LIMESTONE (Mixed lithologies), pale yellow (5Y 8/2), harder than above; cuttings are limestone fragments not mostly disaggregated material. Bioclast grainstone, well-cemented, hard, low to moderate (10 to 20%) macroporosity and apparent permeability. Minor (< 20%) calcareous dolomite in which large foraminifera were not replaced.
2700 - 2710	LIMESTONE, yellowish gray (5Y 8/2), softer than above, a lot of partially disaggregated material, bioclast grainstone, variable hardness (soft to moderate), moderate macroporosity and apparent permeability. Some cuttings have scattered dolomite rhombs. Foraminifera common.
2710 - 2720	DOLOMITIC LIMESTONE to CALCAREOUS DOLOMITE, pale yellow (5Y 8/3 to 7/2). Bioclast grainstone of variable hardness. Cutting sample includes well lithified fragments and disaggregated material (bioclasts and less common dolomite rhombs). Overall probably moderate macroporosity and permeability.
2720 - 2730	LIMESTONE, very pale orange (10YR 8/2), bioclast grainstone, harder than above (moderately hard), moderate intergranular porosity and permeability.
2730 - 2740	LIMESTONE, as above
2740 - 2750	LIMESTONE, as above
2750 - 2760	LIMESTONE, as above

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
2760 - 2770	LIMESTONE (50%), as above DOLOSTONE (50%), light yellowish brown (10YR 6/4), hard, fine to medium crystalline, low vuggy macroporosity, with inclusions of limestone as above.
2770 - 2780	DOLOSTONE (60%), as above LIMESTONE (40%), as above
2780 - 2790	LIMESTONE (50%), very pale brown (10YR 8/2), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams LIMESTONE (40%), gray (10YR 6/1) to black (10YR 2/1), grainstone to wackestone, moderately hard, high intergranular and vuggy macroporosity, peloids, forams. DOLOSTONE (10%), light yellowish brown (10YR 6/4), hard, fine to medium crystalline, low vuggy macroporosity
2790 - 2800	LIMESTONE (50%), as above LIMESTONE (40%), as above DOLOSTONE (10%), as above
2800 - 2810	LIMESTONE (60%), very pale brown (10YR 8/2), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams LIMESTONE (40%), gray (10YR 6/1) to black (10YR 2/1), grainstone to wackestone, moderately hard, high intergranular and vuggy macroporosity, peloids, forams.
2810 - 2816	LIMESTONE (60%), very pale brown (10YR 8/2), grainstone to packstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, marl, silt, peloids, forams.
2816 - 2824	LIMESTONE, very pale brown (10YR 8/2), peloid bioclast grainstone/packstone, hard, moderate vuggy and intergranular macroporosity, peloids, forams, echinoids, mollusk fragments.
2825 - 2825	LIMESTONE, gray (10YR 6/1), wackestone to grainstone, hard, moderate vuggy and moldic macroporosity, peloids, forams, echinoids.
2825 - 2828.5	LIMESTONE, very pale brown (10YR 8/2), peloid bioclast grainstone/packstone, moderately hard, moderate vuggy and intergranular macroporosity, locally high macroporosity, peloids, forams, echinoids, mollusk fragments.
2828.5 - 2831	LIMESTONE, gray (10YR 5/1), wackestone to mudstone, hard, very well indurated, very low macroporosity, laminar texture, chert nodules.
2830 - 2840	LIMESTONE (60%), very pale brown (10YR 8/2), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams LIMESTONE (30%), gray (10YR 6/1) to black (10YR 2/1), grainstone to wackestone, moderately hard, high intergranular and vuggy macroporosity, peloids, forams. DOLOSTONE (10%), light yellowish brown (10YR 6/4), hard, fine to medium crystalline, low vuggy macroporosity
2840 - 2850	LIMESTONE white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams.

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2850 - 2860	LIMESTONE white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams.
2860 - 2870	LIMESTONE white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams.
2870 - 2880	LIMESTONE white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids, forams.
2880 - 2890	LIMESTONE as above
2890 - 2900	LIMESTONE as above
2900 - 2910	LIMESTONE (80%), white (10YR 8/1), grainstone, soft to moderately hard. (20%), gray (10YR 6/1), hard, low macroporosity and apparent permeability
2910 - 2920	LIMESTONE as above
2920 - 2930	LIMESTONE, white (10YR 8/1), grainstone, soft, friable to moderately hard. Moderate vuggy macroporosity.
2930 - 2940	LIMESTONE, as above
2940 - 2950	LIMESTONE, white (10YR 8/1), grainstone, moderately hard to hard, lower vuggy macroporosity.
2950 - 2960	LIMESTONE, white (10YR 8/1), grainstone, soft to moderately hard, lower vuggy macroporosity.
2960 - 2970	LIMESTONE (80%), white (10YR 8/1), grainstone, moderately hard to hard, lithified fragments abundant, much less diagggregated material in cuttings. Lower vuggy macroporosity than above. CLAY (15%) greenish gray (GLE Y1 6/10GY) soft to moderately hard, well consolidated. DOLOSTONE (5%) light yellowish brown (10YR 6/4), hard, fine to medium crystalline, low vuggy macroporosity.
2970 - 2980	LIMESTONE, white (10YR 8/1), grainstone, moderately hard, variable vuggy macroporosity, moderate apparent permeability,
2980 - 2990	LIMESTONE, as above
2990 - 3000	LIMESTONE , as above
3000 - 3010	LIMESTONE, as above
3010 - 3020	LIMESTONE, as above
3020 - 3030	DOLOSTONE (60%) grayish brown (10YR 5/1) hard, irregular fracture, medium to coarsely crystalline, good vuggy macroporosity, some fracture macroporosity. LIMESTONE (40%) pale yellow (2.5 Y 8/2) slightly friable, fine grainstone with good intergranular macroporosity.
3030 - 3040	As above.
3040 - 3050	DOLOSTONE (75%) pale brown (10YR 6/3) hard, irregular fracture, coarsely crystalline, good intergranular and vuggy macroporosity. DOLOSTONE (25%) brown (7.5YR 5/2) very hard, irregular fracture, fine sucrosic texture,

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	very low macroporosity.
3050 - 3060	DOLOSTONE (75%) light gray (10YR 7/2) very hard, irregular fracture, fine to medium sucrosic texture, some fracture macroporosity. DOLOSTONE (25%) white (10YR 8/1) very hard and dense, poor conchoidal fracture, very finely crystalline, some fracture macroporosity.
3060 - 3070	DOLOSTONE (50%) light yellowish brown (10YR 6/4), fine crystalline structure, low vuggy and intergranular macroporosity, moderately hard. DOLOSTONE (40%) grayish brown (10YR 5/2) moderately hard, fine LIMESTONE (10%) white (10YR 8/1) partial dolomitization, moderately hard, low macroporosity. Cuttings disaggregated fine dolomite crystals and limestone with some small fragments of dolostone and limestone.
3070 - 3080	DOLOSTONE and LIMESTONE as above
3080 - 3090	DOLOSTONE (80%) pale yellow to light yellowish brown (2.5YR 7/4 to 2.5YR 6/3), fine to medium grained crystalline structure, low to moderate intergranular porosity in medium grained crystal structure. DOLOSTONE (10%) white (10YR 8/1), fine crystalline structure DOLOSTONE (10%) gray (10YR 5/1), gray and white fragments harder with finer crystalline structure than yellowish brown dolostone. Cuttings mixture of mostly fine to medium grained crystals and some small fragments.
3090 - 3100	DOLOSTONE same as above
3100 - 3110	DOLOSTONE (90%) gray (10YR6/1) dense, poor conchoidal fracture, fine sucrosic texture, some fracture macroporosity DOLOSTONE (10%) brown (10YR5/3), moderately hard to slightly friable, irregular fracturing, coarse sucrosic texture, good intergranular macroporosity
3110 - 3120	DOLOSTONE (80%) light gray (10YR 7/2) very hard, poor conchoidal fracture, very fine sucrosic texture, some fracture macroporosity. DOLOSTONE (20%) brown rock as above
3120 - 3130	DOLOSTONE (100%) light gray rock as above.
3130 - 3140	DOLOSTONE (100%) light gray (10YR 7/2), very hard, extensive fracturing and medium to coarse crystallization along fractures
3140 - 3150	DOLOSTONE (100%) light olive brown (2.5YR 5/3), very hard, fine to medium sucrosic texture. Some fracture macroporosity. 3140 - 3150 (cont'd)
3150 - 3160	DOLOSTONE (90%) light brownish grey (10YR 6/2), very hard, fine to medium sucrosic texture, larger fragments DOLOSTONE (10%) light yellowish brown (10YR 6/4) and grayish brown (10YR 5/2) very hard, fine sucrosic texture
3160 - 3170	DOLOSTONE (100%) light grey (10YR 7/1 and 7/2), very hard, fine texture, some fracture macroporosity

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3170 - 3180	DOLOSTONE (90%) light brownish grey (10YR 6/2), very hard fine sucrosic texture DOLOSTONE (10%), light grey (10YR 7/1) as above
3180 - 3190	DOLOSTONE (100%) light yellowish brown (2.5YR 6/3), very hard, fine crystalline structure, conchoidal fracture.
3190 - 3200	DOLOSTONE (100%) light olive brown (2.5YR 5/3), very hard, re-crystallization along fractures (medium grained)
3200 - 3210	DOLOSTONE (100%) light brownish grey (10YR 6/2) with minor amounts of dark grey (10YR 4/1) very hard, crystalline, conchoidal fracturing
3210 - 3220	DOLOSTONE (100%) light brownish grey (10YR 6/2) to grey (10YR 6/1) same texture as above
3220 - 3230	DOLOSTONE (100%) brown (10YR 5/3), very hard, same texture as above.
3230 - 3240	DOLOSTONE (100%) light olive brown (2.5YR 5/3), very hard, same texture as above.
3240 - 3250	DOLOSTONE (100%) grayish brown (10YR 5/2) very hard and dense, irregular to poor conchoidal fracture, fine sucrosic texture, some fracture macroporosity.
3250 - 3260	DOLOSTONE (100%) as above.
3260 - 3270	DOLOSTONE (100%) grayish brown (10YR 5/2) very hard and dense, poor conchoidal fracture, fine sucrosic texture, some fracture macroporosity.
3270 - 3280	DOLOSTONE (100%) gray (10YR 5/1) very hard and dense, poor conchoidal fracture, fine sucrosic texture, some fracture macroporosity.
3280 - 3290	DOLOSTONE (100%) gray rock as above.
3290 - 3300	DOLOSTONE (100%) dark gray (10YR 4/1) to light gray (10YR 7/1) very hard and dense, good conchoidal fracture, very finely crystalline, some fracture macroporosity.
3300 - 3310	DOLOSTONE (100%) dark gray (10YR 4/1) to gray (10YR 5/1) very hard, irregular to poor conchoidal fracture fine sucrosic texture, some fracture macroporosity.
3310 - 3320	DOLOSTONE (100%) dark gray (10YR 4/1 to gray (10YR 6/1) very hard, poor conchoidal fracture, fine to very finely crystalline, some fracture porosity.
3220 - 3330	DOLOSTONE (100%) as above
3330 - 3340	DOLOSTONE (100%) very dark grayish brown (10YR 3/2), very hard, very fine sucrosic texture with brown (10YR 5/3) fine crystal structure along fractures.
3340 - 3350	DOLOSTONE (100%) gray (10YR 6/1) very hard and dense, poor conchoidal fracture, microcrystalline, some fracture macroporosity.
3350 - 3360	DOLOSTONE (100%) grayish brown (10YR 5/2) very hard and dense, poor conchoidal fracture, microcrystalline, fracture and vuggy macroporosity common.
3360 - 3370	DOLOSTONE (100%) light grayish brown (10YR 6/2) very hard and dense, poor to good conchoidal fracture, some fracture and vuggy macroporosity.
3370 - 3380	DOLOSTONE (100%) as above.
3380 - 3390	DOLOSTONE (100%) dark gray (2.5Y 4/1) to light gray (2.5Y 7/1) very hard and dense, good conchoidal fracture, microcrystalline, some vuggy macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
0 - 10	SAND (90%), quartz, poorly sorted, organics, construction debris LIMESTONE (20%), pinkish gray (5YR 7/2), hard, fine-grained shell fragments.
10 - 20	SHELLY LIMESTONE (100%): pinkish white (5YR 8/2) hard, grainstone composed of fine to coarse shell fragments. Fine subgranular quartz grains are common. Cement is dense to slightly chalky calcite. Good moldic and intergranular porosity. Few fine black phosphate grains.
20- 30	SHELLY LIMESTONE (100%): light gray (5YR 7/1) hard grainstone with fine to coarse shell fragments and abundant fine subangular quartz grains in dense calcite cement. Some moldic porosity. Few fine black phosphate grains.
30 - 40	SHELLY QUARTZ SANDSTONE (100%): light gray (5YR 7/1) very hard, fine subangular quartz with fine to coarse shell fragments and dense calcite cement. Low intergranular and moldic porosity. Some fine black phosphate grains.
40 - 50	SANDY LIMESTONE (100%): pale yellow (5Y 8/2), hard to very hard, quartz sand-fine- inclusions, medium moldic macroporosity.
50 - 60	QUARTZ SAND AND SANDSTONE (100%): light gray (10YR 7.5/1), fine grained, sub angular, moderately well sorted, 5-7% fine grained phosphate and heavy mineral grains, 2-3% shell fragments (white)- subsidiary sandstone, same composition as sand, sand is likely sandstone pulverized by bit action
60 - 70	SHELLY QUARTZ SANDSTONE (100%): light gray (5YR 7/1) hard, fine to medium-grained subangular quartz with some fine to coarse shell fragments. Calcite cement is slightly chalky. Low intergranular and moldic porosity. Some black to dark brown phosphate grains.
70 - 80	SANDY LIMESTONE (100%): pale yellow (5Y 8/2), moderately hard, grainstone, fine grained subangular quartz with some shell fragments. More calcite cement than above. Some small blackish-brown phosphate grains, low intergranular and moldic macroporosity.
80 - 90	SANDY LIMESTONE (100%): white (5Y 8/1) hard grainstone, fine to coarse shell fragments and abundant fine to medium subangular quartz grains. Dense calcite cement. Low intergranular and moldic porosity. Fine black phosphate grains are rare.
90 -100	CALCAREOUS SANDSTONE (100%): pulverized into medium sand size pieces - mostly, light gray (5Y 7.5/1), fine grained quartz, 5% shell fragments (white), 5% fine grained phosphate and other heavy mineral grains, low to moderate moldic macroporosity and intergranular porosity.
100 - 110	SANDY LIMESTONE (100%): light gray (5Y 7/1) hard grainstone, medium to coarse shell fragments and abundant medium to coarse subangular quartz grains. Chalky calcite cement. Some intergranular and moldic porosity. Some fine to medium black and dark brown phosphate grains
110 - 120	Same as above
120 - 130	SANDY LIMESTONE (75%): same as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	SHELLY SANDY CLAY (25%): pale olive (5Y 6/3) soft, slightly plastic, calcareous, with fine to medium subangular quartz grains and fine to coarse shell fragments. Fine black phosphate grains are common.
130 - 140	Same as above
140 - 150	SANDY SHELLY CLAY (25%) same as above. SHELLY SANDSTONE (75%) gray (5Y 6/1) hard, fine to medium grained quartz with abundant fine to very coarse shell fragments. Dense calcite cement. Low intergranular and moldic porosity. Fine black phosphate grains are common.
150 - 160	No sample.
160 - 170	SAND (100%): greenish gray (GLE Y1 6/1), medium to coarse, poorly sorted, subrounded to angular, approximately 70% quartz grains and 30% carbonate grains, shell fragments.
170 - 180	SAND (100%): greenish gray (GLE Y1 6/1), medium to coarse, poorly sorted, subrounded to angular, approximately 70% quartz grains and 30% carbonate grains, very silty, shell fragments.
180 - 190	SILT (100%): dark greenish gray (GLE Y1 4/1), very sandy with fine to very fine quartz sand, clay, mollusk shell fragments, < 5% fine grained phosphate.
190 - 200	SILT (100%): as above.
200 - 210	SHELLY SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), very sandy with fine to very fine quartz sand, clay, approximately 10% mollusk shell fragments, < 5% fine grained phosphate.
210 - 215	SHELLY SANDY CLAY (100%) as above.
215 - 220	SHELLY SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), very sandy with fine to very fine quartz sand, silt, approximately 20% mollusk shell fragments, < 5% fine grained phosphate.
220 - 225	SHELLY SANDY CLAY (100%) as above.
225 - 230	SHELLY SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), very sandy with fine to very fine quartz sand, silt, approximately 30% mollusk shell fragments, < 5% fine grained phosphate.
230 - 235	SHELLY SANDY CLAY (100%) as above.
235 - 240	SHELLY SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), very sandy with fine to very fine quartz sand, silt, approximately 10% mollusk shell fragments, < 5% fine grained phosphate.
240 - 250	SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), soft, very sandy with fine to very fine quartz sand, silt, < 5% fine grained phosphate.
250 - 260	SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), soft, very sandy with fine to very fine quartz sand, silt, < 5% fine grained phosphate.
260 - 270	SANDY CLAY (100%) as above.
270 - 280	SANDY CLAY (100%) as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
280 - 290	SANDY CLAY (100%) as above.
290 - 300	SANDY CLAY (100%) as above.
300 - 310	SANDY CLAY (100%): dark greenish gray (GLE Y1 4/1), soft, less cohesive than above, very sandy with fine to very fine quartz sand, silt, < 5% fine grained phosphate.
310 - 320	SANDY CLAY (100%) as above.
320 - 330	SANDY CLAY (100%) as above.
330 - 340	SANDY CLAY (100%) as above.
340 - 350	SANDY CLAY (100%) as above.
350 - 360	SANDY CLAY (100%) as above.
360 - 370	SANDY CLAY (100%) as above.
370 - 380	SANDY CLAY (100%) as above.
380 - 390	SILTY SANDY CLAY (100%), dark greenish grey (GLE Y1 4/1), soft, very silty, very fine quartz sand, trace of very fine phosphate.
390 - 400	SILTY SANDY CLAY (100%) as above.
400 - 410	SILTY SANDY CLAY (100%) as above.
410 - 420	SILTY SANDY CLAY (100%) as above.
420 - 430	SILTY SANDY CLAY (100%) as above.
430 - 440	SILTY LIMESTONE (100%) light greenish gray (GLE Y1 7/1), mudstone, soft to hard, very low macroporosity, very silty, marly, very fine phosphate.
440 - 450	SILTY LIMESTONE (100%) as above.
450 - 460	SILTY LIMESTONE (100%) as above.
460 - 470	SILTY LIMESTONE (100%) as above.
470 - 480	LIMESTONE (100%) greenish gray (GLE Y1 5/1), grainstone, moderately hard to soft, moderate to high vuggy and moldic macroporosity, peloids, very fine phosphate, mollusk fragments.
480 - 490	LIMESTONE (100%) as above.
490 - 500	LIMESTONE (100%) as above.
500 - 510	LIMESTONE (100%) white (2.5Y 8/1), wackestone, soft, moderate vuggy macroporosity, peloids, mollusk fragments, silt.
510 - 520	LIMESTONE (100%) pale yellow (2.5Y 8/2), wackestone, hard, high moldic and vuggy macroporosity, mollusks, peloids.
520 - 530	LIMESTONE (100%) as above.
530 - 540	LIMESTONE (100%) as above.
540 - 550	LIMESTONE (100%) as above.
550 - 560	LIMESTONE (100%) as above.
560 - 570	LIMESTONE (100%) white (10YR 8/1), wackestone, hard, high moldic and vuggy

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	macroporosity, mollusks, peloids, coral, marl.
570 - 580	LIMESTONE (100%) as above.
580 - 590	LIMESTONE (100%) as above.
590 - 600	LIMESTONE (100%) as above.
600 - 610	SILT (100%) light greenish gray (GLE Y1 8/1), soft, sandy, clayey, fragments of limestone, trace of very fine phosphate.
610 - 620	SILT (100%) light greenish gray (GLE Y1 8/1), soft, sandy, clayey, fragments of limestone, trace of very fine phosphate.
620 - 630	SILT (100%) light greenish gray (GLE Y1 8/1), soft, sandy, clayey, fragments of limestone, trace of very fine phosphate.
630 - 640	SILT (100%) light greenish gray (GLE Y1 8/1), soft, sandy, clayey, fragments of limestone, trace of very fine phosphate.
640 - 650	SILT (100%) light greenish gray (GLE Y1 8/1), stiff, sandy, clayey, fragments of limestone, trace of very fine phosphate.
650 - 660	SILT (50%) light greenish gray (GLE Y1 8/1), stiff, sandy, clayey, fragments of limestone, trace of very fine phosphate. LIMESTONE (50%) light greenish gray (GLE Y1 5/1), wackestone, soft, low vuggy macroporosity, sand, peloids.
660 - 670	CLAY (100%) light greenish gray (GLE Y1 7/1), soft, sticky, silty, limestone fragments.
670 - 680	CLAY (100%) light greenish gray (GLE Y1 7/1), soft, sticky, silty, limestone fragments.
680 - 690	CLAY (100%) light greenish gray (GLE Y1 7/1), soft, sticky, silty, limestone fragments.
690 - 700	LIMESTONE (100%) light greenish gray (GLE Y1 5/1), mudstone, soft, very low macroporosity, silt.
700 - 710	LIMESTONE (100%) light greenish gray (GLE Y1 5/1), mudstone, soft, very low macroporosity, silt.
710 - 720	CLAY (100%) light greenish gray (GLE Y1 7/1), stiff, sticky, silty, limestone fragments.
720 - 730	SHELLY CLAY (100%) white (2.5Y 8/1) abundant large shell fragments in a clay matrix as above.
730 - 740	SHELLY CLAY (100%) as above.
740 - 750	SHELLY CLAY (100%) light gray (2.5Y 7/1) medium to large shell fragments in a slightly plastic calcareous clay. Some very fine black phosphate grains.
750 - 760	SHELLY CLAY (100%) as above.
760 - 770	SHELLY CLAY (100%) as above.
770 - 780	SHELLY CLAY (100%) as above.
780 - 790	SHELLY CLAY (50%) as above. LIMESTONE (50%) friable, medium to coarse-grained packstone with good moldic

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	macroporosity. Some very fine black phosphate grains.
790 - 800	SHELLY CLAY (50%) and LIMESTONE (50%) as above.
800 - 810	SANDY SHELLY CLAY (100%) light gray (7.5YR 7/1) slightly plastic calcareous clay with fine-grained quartz, shell fragments, and black phosphate grains.
810 - 820	LIMESTONE (100%) light gray (7.5YR 7/2) moderately friable packstone with good intergranular and moldic porosity.
820 - 830	LIMESTONE (50%) light gray rock as above. LIMESTONE (50%) white (off scale) hard grainstone composed of well-cemented large shells and shell fragments.
830 - 840	LIMESTONE (90%) white grainstone as above. LIMESTONE (10%) light gray rock as above.
840 - 850	LIMESTONE (90%) white grainstone as above. SHELLY SANDY CLAY (10%) light gray (2.5Y 7/1) slightly plastic, very calcareous, with fine to medium-grained shell fragments, and fine quartz and black phosphate grains.
850 - 860	LIMESTONE (100%) white grainstone as above.
860 - 870	LIMESTONE (100%) white (off-scale) slightly friable grainstone composed of large shell fragments.
870 - 880	LIMESTONE (100%) as above.
880 - 890	LIMESTONE (75%) white grainstone as above. SHELLY MARL (25%) light gray (2.5YR 7/2) slightly plastic with fine to medium shell fragments.
890 - 900	SHELLY MARL (100%) as above.
900 - 910	SHELLY MARL (100%) as above.
910 - 920	SHELLY MARL (75%) as above. LIMESTONE (25%) white (off-scale) hard, well-cemented grainstone composed of large shells and shell fragments.
920 - 930	SHELLY MARL (75%) as above. LIMESTONE (25%) white grainstone as above.
930 - 940	SHELLY MARL (50%) as above. LIMESTONE (50%) white grainstone as above.
940 - 950	SHELLY MARL (50%) as above. LIMESTONE (50%) white grainstone as above.
950 - 960	CLAY (75%) olive gray (5Y 5/2) moderately plastic, dense, with some fine quartz grains and fine to medium shell fragments. LIMESTONE (25%) light gray (5Y 7/1) friable wackestone.
960 - 970	CLAY (75%) olive gray rock as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	LINESTONE (25%) light gray rock as above.
970 - 980	CLAY (100%) olive gray rock as above.
980 - 990	MARLY CLAY (100%) light gray, slightly plastic, dense, very calcareous.
990 - 1000	CLAY (100%) olive gray (5Y 5/2) moderately plastic, dense, calcareous.
1000 - 1010	CLAY (100%) olive gray rock as above.
1010 - 1020	CLAY (100%) olive gray rock as above.
1020 - 1030	MARLY CLAY (100%) light gray (5Y 7/2) moderately plastic, less dense than above.
1030 - 1040	SHELLY CLAY (100%) light gray (5Y 7/1) with abundant large shell fragments, very calcareous.
1040 - 1050	SHELLY CLAY (100%) as above.
1050 - 1060	SHELLY CLAY (100%) as above
1060 - 1070	LIMESTONE (100%) white (off-scale) hard grainstone composed of well-cemented large shell fragments.
1070 - 1080	LIMESTONE (100%) as above.
1080 - 1090	SANDY LIMESTONE (100%), light gray (5Y 7/2), wackestone, hard, low moldic macroporosity, low apparent permeability, approximately 10% quartz sand, mollusks, <5% very fine sand size phosphate,
1090 - 1100	LIMESTONE (100%), light gray (5Y 7/1), mudstone/wackestone, moderately hard to hard, low moldic macroporosity, sand, bivalve fragments.
1100 - 1110	LIMESTONE (100%) as above.
1110 - 1120	LIMESTONE (100%), pale yellow (5Y 8/2) to light gray (5Y 7/2), grainstone, moderately hard to soft, moderate intergranular macroporosity, peloids, sand, gastropods, bivalves, forams.
1120 - 1130	DOLOMITE (100%), gray (5Y 5/1), hard, medium crystalline, moderate vuggy macroporosity.
1130 - 1140	LIMESTONE (80%), medium light gray (N6), wackestone, hard, moderate moldic and vuggy macroporosity, mollusks, bryozoans. LIMESTONE (20%), white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.
1140 - 1150	LIMESTONE (100%), white (10YR 8/1), grainstone, moderately hard to soft, moderate intergranular and vuggy macroporosity, peloids.
1150 - 1160	LIMESTONE (100%) as above.
1160 - 1170	LIMESTONE (100%) as above.
1170 - 1180	LIMESTONE (100%), white (10YR 8/1), grainstone, soft, moderate to high intergranular macroporosity, peloids.
1180 - 1190	LIMESTONE (100%), pale yellowish brown (10YR 6/2), grainstone, soft, moderate to high intergranular macroporosity, peloids.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1190 - 1200	LIMESTONE (100%), very pale orange (10YR 8/2), grainstone, soft, moderate to high intergranular macroporosity, peloids.
1200 - 1210	LIMESTONE (100%), white (5Y 8/1) to yellowish gray (5Y 7/2), wackestone to grainstone, moderately hard, high intergranular and vuggy macroporosity, peloids echinoids.
1210 - 1220	LIMESTONE (100%), white (5Y 8/1) to yellowish gray (5Y 7/2), wackestone to grainstone, moderately hard, high intergranular and vuggy macroporosity, peloids echinoids.
1220 - 1230	LIMESTONE (100%), white (5Y 8/1) to yellowish gray (5Y 7/2), wackestone to grainstone, moderately hard, high intergranular and vuggy macroporosity, peloids echinoids.
1230-1240	LIMESTONE, white (5Y 8/1) and gray (5Y 5/1), wackestone, soft, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1240- 1250	LIMESTONE, pale yellow (5Y 8/2) to strong brown (7.5YR 6/6), wackestone, soft to moderately hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1250 -1260	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft to moderately hard, high vuggy macroporosity, abundant echinoids, peloids, gastropods.
1260 - 1270	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1270 -1280	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams. Flakes of drill corroded drill pipe and cement.
1280 -1290	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1290 - 1300	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams. Flakes of drill corroded drill pipe.
1300 - 1310	LIMESTONE, very pale brown (10YR 7/3), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1310 - 1320	LIMESTONE, very pale brown (10YR 7/3 to 10YR 8/2) wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams. Some cement.
1320 - 1330	LIMESTONE, very pale brown (10YR 8/2), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams.
1330-1340	LIMESTONE, very pale brown (10YR 7/3 to 10YR 8/2), wackestone, soft, moderate vuggy macroporosity, echinoids, peloids, gastropods, forams. Some cement.
1340 -1350	LIMESTONE, very pale brown (10YR 8/2), grainstone to wackestone, moderately hard, moderate vuggy and moldic macroporosity, peloids, gastropods.
1350 - 1360	LIMESTONE, very pale brown (10YR 8/4), wackestone, soft, low vuggy macroporosity, sand, peloids.
1360 - 1370	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1370 - 1380	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1380 - 1390	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1390 - 1400	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids, gastropods.
1400 - 1410	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids,.
1410 - 1420	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids
1420 - 1430	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids
1430 - 1440	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids.
1440 - 1450	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids.
1450 - 1460	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids.
1460 - 1470	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids.
1470 - 1480	LIMESTONE, strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids.
1480 - 1490	LIMESTONE (50%), strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids. LIMESTONE (50%), pale yellow (2.5Y 8/2), wackestone, hard, high vuggy and moldic macroporosity, peloids, mollusks.
1490 - 1500	LIMESTONE (50%), strong brown (7.5YR 5/6) to reddish yellow (7.5YR 5/6), grainstone to wackestone, soft, moderate vuggy and moldic macroporosity, peloids. LIMESTONE (50%), pale yellow (2.5Y 8/2), wackestone, hard, high vuggy and moldic macroporosity, peloids, mollusks.
1500 - 1510	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1510 - 1520	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1520 - 1530	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1530 - 1540	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1540 - 1550	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1550 - 1560	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1560 - 1570	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1570 - 1580	LIMESTONE, very pale brown (10YR 7/3), wackestone, moderately hard, low vuggy macroporosity, peloids, silt.
1590 - 1600	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), grainstone, soft, moderate intergranular macroporosity, peloids.
1600 - 1610	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), grainstone, soft, moderate intergranular macroporosity, peloids.
1610 - 1620	LIMESTONE, very pale brown (10YR 7/3) to light gray (10YR 7/1), grainstone, soft, moderate intergranular macroporosity, peloids.
1620 - 1630	LIMESTONE, pale yellow (5Y 8/2), wackestone to grainstone, soft to moderately hard, moderate vuggy and intergranular macroporosity, peloids, mollusks.
1630 - 1640	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), packestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1640 - 1650	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), packestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1650 - 1660	LIMESTONE, pale yellow (5Y 8/2) to light gray (5Y 7/2), packestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1660 - 1670	LIMESTONE, pale brown (10YR 6/3), packestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks.
1670 - 1680	LIMESTONE (90%) pale brown (10YR 6/3), packestone, moderately hard, moderate vuggy macroporosity, peloids, mollusks. LIMESTONE (10%) light gray (2.5YR 7/1) very hard, recrystallized, poor conchoidal fracture, some vuggy macroporosity.
1680 - 1690	LIMESTONE (80%) light gray (10YR 7/2), packestone, moderately hard, high to very high vuggy macroporosity, mollusks. LIMESTONE (20%) light gray (2.5YR 7/1) very hard, recrystallized, poor conchoidal fracture, some vuggy macroporosity.
1690 - 1700	LIMESTONE (70%) light gray (10YR 7/2), packestone, moderately hard, very high vuggy macroporosity, peloidal. LIMESTONE (30%) light gray (2.5YR 7/1) very hard, recrystallized, poor conchoidal fracture, some vuggy macroporosity.
1700 - 1710	LIMESTONE (50%) light gray (10YR 7/2), packestone, moderately hard, very high vuggy macroporosity, peloids granular texture. LIMESTONE (50%) light gray (2.5YR 7/1) very hard, recrystallized, poor conchoidal fracture, some vuggy macroporosity.
1710 - 1720	LIMESTONE (50%) light gray (10YR 7/2), packestone, moderately hard, very high vuggy

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	macroporosity, peloids, granular texture. LIMESTONE (50%) light gray (2.5YR 7/1) very hard, recrystallized, poor conchoidal fracture, some vuggy macroporosity.
1720 - 1730	LIMESTONE (50%) gray (GLE Y1 6/1), hard, recrystallized, fair conchoidal fracture, some vuggy macroporosity. LIMESTONE (50%) white (10YR 8/1) moderately hard packstone with good moldic and vuggy macroporosity.
1730 - 1750	LIMESTONE (50%) gray (GLE Y1 6/1), hard, recrystallized, fair conchoidal fracture, some vuggy macroporosity. LIMESTONE (50%) white (10YR 8/1) moderately hard packstone with good moldic and vuggy macroporosity.
1750 - 1760	LIMESTONE (50%) gray (GLE Y1 6/1), hard, recrystallized, fair conchoidal fracture, some vuggy macroporosity. LIMESTONE (50%) white (10YR 8/1) moderately hard packstone with good moldic and vuggy macroporosity.
1760 - 1770	LIMESTONE (100%) white (5Y 8/1) hard to moderately hard grainstone with good intergranular and moldic porosity.
1770 - 1780	LIMESTONE (100%) white (5Y 8/1) hard to moderately hard grainstone with good intergranular and moldic porosity.
1780 - 1790	LIMESTONE (100%) light gray (GLE Y1 7/1) to light greenish gray (GLE Y1 7/1), wackestone, hard, moderate to high vuggy macroporosity, mollusks, forams, silt.
1790 - 1800	LIMESTONE (100%) pale yellow (2.5Y 7/3), wackestone, soft to moderately hard, low vuggy macroporosity, peloids.
1800 - 1810	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1810 - 1820	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1820 - 1830	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1830 - 1840	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1840 - 1850	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1850 - 1860	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1860 - 1870	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1870 - 1880	LIMESTONE (50%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.

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	LIMESTONE (50%) light gray (10YR 7/1), wackestone, hard, low to moderate vuggy macroporosity, sand.
1880 - 1890	LIMESTONE (50%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids. LIMESTONE (50%) light gray (10YR 7/1), wackestone, hard, low to moderate vuggy macroporosity, sand.
1890 - 1900	LIMESTONE (100%) very pale brown (10YR 7/4), grainstone, soft, low intergranular macroporosity, peloids.
1900 - 1910	LIMESTONE (100%) light gray (10YR 7/1), wackestone, hard, low vuggy macroporosity, sand.
1910 - 1920	LIMESTONE (100%) light gray (10YR 7/2), grainstone, moderately hard, low intergranular macroporosity, peloids.
1920 - 1930	LIMESTONE (100%) light gray (10YR 7/2), grainstone, moderately hard, low intergranular macroporosity, peloids.
1930 - 1940	LIMESTONE (100%) light gray (10YR 7/2), grainstone, moderately hard, low intergranular macroporosity, peloids.
1940 -1950	LIMESTONE (100%), light grey (10YR 7/2) to pale yellow (2.5YR 7/3), grainstone, moderately hard, low to medium apparent permeability.
1950 - 1960	LIMESTONE (100%) light grey (10YR 7/2 and 2.5YR 7/2), moderately friable, fine to medium grainstone with good moldic porosity.
1960 - 1970	LIMESTONE (100%) same as above
1970 - 1980	LIMESTONE (70%) light grey (2.5YR 7/2) fine-grained grainstone with good moldic porosity LIMESTONE (30%) pinkish grey (7.5 YR 6/2) fine-grained grainstone with good moldic porosity
1980 - 1990	LIMESTONE (100%) light gray (2.5Y 7/2) to light pinkish grey (7.5YR 6/2) moderately friable, fine to medium grained grainstone with good moldic porosity.
1990 - 2000	LIMESTONE (100%) pale yellow (2.5YR 7/3)) moderately friable, fine to medium grained grainstone with good moldic porosity.
2000 - 2010	LIMESTONE (80%) pale yellow (2.5YR 7/3) and (20%) light brownish grey (10YR 6/2) and light grey (2.5YR 7/2) as above
2010 - 2020	LIMESTONE (100%) pale yellow (2.5YR 7/3) and light grey (2.5YR 7/2) as above.
2020 - 2030	LIMESTONE (100%) light gray (2.5YR 7/2) rock as above
2030 - 2040	LIMESTONE (100%) light grey (2.5YR 7/2) and very pale brown (10YR 7/3) and white (10YR 8/1) as above
2040 - 2050	LIMESTONE (100%) light grey (2.5YR 7/2) and very pale brown (10YR 7/3) as above
2050 - 2060	LIMESTONE (100%) pale brown (10YR 6/3) to light gray (10YR 7/2) slightly friable medium to coarse grainstone with good intergranular and moldic macroporosity.
2060 - 2070	LIMESTONE (100%) as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
2070 - 2080	LIMESTONE (100%) as above.
2080 - 2090	LIMESTONE (100%) as above.
2090 - 2100	LIMESTONE (100%) as above.
2100 - 2110	LIMESTONE (100%) light gray (10YR 7/1) moderately friable fine to medium grainstone with good intergranular and moldic porosity.
2110 - 2120	LIMESTONE (100%) as above.
2120 - 2130	LIMESTONE (100%) light gray (7.5YR 7/1) slightly friable, fine to medium-grained grainstone with good intergranular and moldic porosity.
2130 - 2140	LIMESTONE (100%) as above.
2140 - 2150	LIMESTONE (100%) as above.
2150 - 2160	LIMESTONE (100%) very pale brown (10YR 7/3), grainstone, moderately hard, medium to high vuggy and intergranular macroporosity, and white (off-chart) wackestone, well cemented, friable, low to moderate intergranular and vuggy macroporosity.
2160 - 2170	LIMESTONE (100%) as above.
2170 - 2180	LIMESTONE (100%) light brownish gray (10YR 6/2), grainstone, moderately hard, medium intergranular macroporosity.
2180 - 2190	LIMESTONE (100%) as above.
2190 - 2200	LIMESTONE (100%) as above.
2200 - 2210	LIMESTONE (100%) as above.
2210 - 2220	LIMESTONE (50%) very pale brown (10YR 8/2) and gray (10YR 6/1), grainstone, moderately hard, well cemented, lower intergranular macroporosity than above. LIMESTONE (50%) very pale brown (10YR 7/3), grainstone, moderate to high vuggy and intergranular porosity
2220 - 2230	LIMESTONE (100%) very pale brown (10YR 7/3), grainstone, moderate to high vuggy and intergranular porosity
2230 - 2240	LIMESTONE (100%) very pale brown (10YR 7/3), grainstone, moderate to high vuggy and intergranular porosity,
2240 - 2250	LIMESTONE (100%) very pale brown (10YR 7/3), grainstone, low to moderate vuggy and intergranular porosity, more well cemented.
2250 - 2260	LIMESTONE (100%) as above.
2260 - 2270	LIMESTONE (80%) as above, LIMESTONE (20%), white (10YR 8/1), packestone, hard, well cemented, low intergranular macroporosity, peloids, forams. Some moldic macroporosity.
2270 - 2280	LIMESTONE (100%) very pale brown (10YR 7/3) to white (10YR 8/1), grainstone, high variability in intergranular porosity, peloids
2280 - 2290	LIMESTONE (100%) as above.
2290 - 2300	LIMESTONE (20%) light gray (10YR 7/2) slightly friable medium-grained packstone, some

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	intergranular macroporosity DOLOSTONE (50%) light gray (10YR 7/2) hard, poor conchoidal fracture, microcrystalline, some fracture macroporosity. DOLOSTONE (30%) dark grayish brown (10YR 4/2) hard, irregular fracture fine to medium sucrosic texture some intergranular and vuggy macroporosity.
2300 - 2310	LIMESTONE (20%) light gray rock as above. DOLOSTONE (40%) light gray rock as above. DOLOSTONE (40%) dark grayish brown rock as above.
2310 - 2320	DOLOSTONE (60%) dark grayish brown (10YR 4/2) hard, irregular to poor conchoidal fracture, fine to coarse sucrosic texture, some fracture macroporosity. DOLOSTONE (40%) brown (10YR 5/3) very hard and dense, poor conchoidal fracture, fine sucrosic texture.
2320 - 2330	LIMESTONE (80%) light gray (10YR 7/2) slightly friable, coarse grainstone with good intergranular and vuggy macroporosity. Some recrystallization. DOLOSTONE (20%) dark grayish brown rock as above.
2340 - 2350	Same as above.
2350 - 2360	LIMESTONE (100%) very pale brown (10YR 8/3) to light gray (10YR 7/1) slightly friable to hard, fine to medium-grained packstone. Low intergranular macroporosity.
2360 - 2370	LIMESTONE (100%) very pale brown rock as above.
2370 - 2380	LIMESTONE (100%) very pale brown rock as above.
2380 - 2390	LIMESTONE (100%) very pale brown rock as above.
2390 - 2400	LIMESTONE (100%) very pale brown rock as above.
2400 - 2410	LIMESTONE (100%) very pale brown rock as above.
2410 - 2420	LIMESTONE (100%) very pale brown rock as above.
2420 - 2428	LIMESTONE (100%) very pale brown rock as above.
2428 - 2430	DOLOSTONE (100%) olive gray (5Y 4/1), hard, very finely crystalline, low vuggy macroporosity.
2430 - 2432	DOLOSTONE (100%) grayish brown (5YR 3/2), moderately hard, low vuggy macroporosity, medium crystalline.
2432 - 2442	DOLOSTONE (100%) moderate yellowish brown (10YR 5/4) to moderate brown (5YR 4/4), hard, finely crystalline, low vuggy macroporosity. See the description of Core 4 for a more detailed lithologic description.
2442 - 2450	DOLOSTONE (100%) pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), hard, finely crystalline, low vuggy macroporosity.
2450 - 2460	DOLOSTONE (100%) gray (10YR 5/1) very hard, poor conchoidal fracture, microcrystalline to finely crystalline, some vuggy macroporosity.
2460 - 2470	DOLOSTONE (50%) gray rock as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	DOLOSTONE (50%) brown (10YR 5/3) hard, irregular fracture coarse sucrosic texture, some vuggy macroporosity
2470 - 2470	As above.
2470 - 2480	As above.
2480 - 2490	DOLOSTONE (100%) grayish brown (10YR 5/2) Hard to very hard, irregular to poor conchoidal fracture, fine sucrosic texture, some vuggy macroporosity.
2490 - 2500	DOLOSTONE (50%) grayish brown rock as above. DOLOSTONE (50%) light brownish gray (10YR 6/2) very hard, poor to good conchoidal fracture, microcrystalline, some vuggy macroporosity.
2500 - 2510	As above.
2510 - 2520	DOLOSTONE, mostly olive gray (5Y4/2) and dark grayish brown (10YR 4/2), dense, very hard, very low visible porosity; some crystal-lined vugs and molds that do not appear to be interconnected.
2520 - 2530	DOLOSTONE, light pale olive (5Y6/2) and less commonly approaching black (5Y2.5/1). Dense, very low porosity and matrix permeability. Lighter colored dolomite is fairly homogeneous, some of darker dolomite is conglomeratic.
2530 - 2540	DOLOSTONE, diverse colors and lithologies. Pale brown (10YR 6/3) to black (10R 2/1), dense to sucrosic. Sucrosic dolostones are lighter colored and appear to be a replacement of a grainstone or packstone. Darker dolostones tend to be dense. Variable porosity and permeability.
2540 - 2550	DOLOSTONE and DOLOMITIC LIMESTONE (subsequal) DOLOSTONE, similar to above. DOLOMITIC LIMESTONE, pale yellow (5Y 8/2), bioclast/peloid packstone or grainstone with abundant scattered dolomite rhombs. Lower apparent porosity and permeability.
2550 - 2560	Mixed lithologies - clayey DOLOSTONE, varied lithologies, similar to above, mostly dense, some sucrosic. LIMESTONE, white (5Y 8/1) bioclast/peloid grainstone, moderate porosity, low to moderate apparent permeability, mostly small cuttings. CLAY (lignitic?), black (10YR 2/1 to 1/1), soft, plastically deformable, stained sample bag.
2560 - 2570	DOLOSTONE, mostly pale brown (10YR 6/4 to 6/3) to brown (10YR 4/3), dense, very low porosity and permeability.
2570 - 2580	DOLOSTONE (50%) as above. DOLOSTONE (50%), light olive (5Y 5/2), hard, dense, microcrystalline to very fine crystalline, conchoidal fracture.
2580 - 2590	DOLOSTONE, light olive (5Y 5/2), hard, dense, microcrystalline to very fine crystalline, conchoidal fracture.
2590 - 2600	DOLOSTONE, as above.

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2600 - 2610	DOLOSTONE, as above.
2610 - 2620	DOLOSTONE, as above.
2620 - 2630	LIMESTONE, yellowish gray (5Y 8/1), grainstone, soft to moderately hard, low intergranular macroporosity, peloids, forams.
2630 - 2640	LIMESTONE, as above.
2640 - 2650	LIMESTONE, as above.
2650 - 2660	LIMESTONE, yellowish gray (5Y 8/1), grainstone, soft to hard, low intergranular macroporosity, peloids, forams, echinoids.
2660 - 2670	LIMESTONE (65%), as above. DOLOSTONE (35%), dark yellowish orange (10YR 6/6), hard, medium crystalline, low vuggy macroporosity.
2670 - 2680	LIMESTONE (85%), as above. DOLOSTONE (15%), pale brown (5YR 5/2), hard, finely crystalline, moderate vuggy macroporosity.
2680 - 2690	LIMESTONE (75%), as above. DOLOSTONE (25%), as above.
2690 - 2700	LIMESTONE (75%), as above. DOLOSTONE (25%), as above.
2700 - 2710	LIMESTONE (75%), as above. DOLOSTONE (25%), as above.
2710-2720	DOLOMITIC LIMESTONE, very pale brown (10YR 8/2) and minor DOLOSTONE, dark grayish brown (10YR 4/2). Limestone: peloid bioclast grainstone with scattered brown dolomite crystals. Moderately hard to hard, low visible porosity and apparent permeability. Fossils include millimeter-sized foraminifera.
2720-2730	LIMESTONE, very pale brown (10YR 8/2), bioclast grainstone, varying degree of cementation and thus hard, porosity (intergranular) and apparent permeability. Porosity and permeability are low to moderate. Minor partial dolomitization.
2730-2740	LIMESTONE, as above, except somewhat softer and porous.
2740-2750	LIMESTONE, very pale brown (10YR 8/2), bioclast grainstone, moderate hardness and macroporosity (intergranular), low apparent permeability. Variable degree of calcite cementation and thus porosity and apparent permeability. Some partial dolomitization (scattered rhombs)
2750-2760	DOLOMITIC LIMESTONE (varying degrees of dolomitization). Very pale brown (10YR 8/2) to pale brown (10YR 6/3), bioclast grainstone, moderate to hard (harder than above), low macroporosity and apparent permeability.
2760 -2770	DOLOMITIC LIMESTONE and CALCAREOUS DOLOSTONE (varying degrees of dolomitization). Similar to above except dolomite is more abundant.

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2770 - 2780	DOLOMITIC LIMESTONE and CALCAREOUS DOLOSTONE, as above, see core description for a more detailed lithology.
2780 - 2790	DOLOMITIC LIMESTONE (50%) yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), wackestone to grainstone, hard, low vuggy macroporosity, peloids, mollusks. DOLOSTONE (50%), dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), hard, medium crystalline, moderate vuggy macroporosity.
2790 - 2800	LIMESTONE (60%), grayish yellow (5Y 7/2), grainstone to wackestone, hard, low intergranular macroporosity, peloids, forams. DOLOMITIC LIMESTONE (40%), light olive gray (5Y 6/1), wackestone, hard, low vuggy macroporosity, peloids, forams.
2800 - 2810	LIMESTONE, yellowish gray (5Y 8/1), grainstone, moderately hard to hard, low intergranular macroporosity, peloids, forams.
2810 - 2820	LIMESTONE, as above.
2820 - 2830	LIMESTONE, as above.
2830 - 2840	LIMESTONE (80%), as above. CLAY (20%), greenish gray (5G 6/1), stiff, silty.
2840 - 2850	LIMESTONE (50%), grayish yellow (5Y 7/2), grainstone, moderately hard, low intergranular macroporosity, peloids, forams. DOLOMITIC LIMESTONE (40%), light olive gray (5Y 6/1), wackestone, hard, low vuggy macroporosity, peloids, forams. DOLOSTONE (10%), dark yellowish brown (10YR 4/2), hard, medium crystalline, low vuggy macroporosity.
2850 - 2860	LIMESTONE, yellowish gray (5Y 8/1), grainstone, moderately hard, moderate vuggy macroporosity, low intergranular macroporosity, peloids, forams.
2860 - 2870	LIMESTONE, as above.
2870 - 2880	LIMESTONE (75%), as above. DOLOSTONE (25%), light olive gray (5Y 6/1), moderately hard, calcarious, very finely crystalline, low vuggy macroporosity, black grains that appear to be phosphate.
2880 - 2890	LIMESTONE, yellowish gray (5Y 8/1), grainstone to wackestone, moderately hard, low vuggy and intergranular macroporosity, peloids, forams.
2890 - 2900	LIMESTONE, as above.
2900 - 2910	LIMESTONE, yellowish gray (5Y 8/1), grainstone, moderately hard, low vuggy and intergranular macroporosity, peloids, forams.
2910 - 2920	LIMESTONE, as above.
2920 - 2930	LIMESTONE, as above.
2930 - 2940	LIMESTONE (90%), as above. CLAY (10%), yellowish gray (5Y 8/1) mottled with light olive gray (5Y 6/1) silty.

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2940 - 2950	LIMESTONE (95%), as above. CLAY (5%), as above.
2950 - 2960	LIMESTONE, yellowish gray (5Y 8/1), grainstone, moderately hard, low vuggy and intergranular macroporosity, peloids, forams.
2960 - 2970	LIMESTONE, as above.
2970 - 2980	LIMESTONE, as above.
2980 - 2990	LIMESTONE, as above.
2990 - 3000	LIMESTONE, as above.
3000 - 3010	LIMESTONE, as above.
3010 - 3020	DOLOSTONE (70%), light olive gray (5Y 5/2), hard, medium crystalline, moderate vuggy macroporosity. LIMESTONE (30%), as above.
3020 - 3030	DOLOSTONE (80%), as above. LIMESTONE (20%), as above.
3030 - 3040	LIMESTONE, yellowish gray (5Y 8/1), grainstone, soft, low intergranular macroporosity, peloids, forams.
3040 - 3050	DOLOSTONE, pale yellowish brown (10YR 6/2), moderately hard, high vuggy macroporosity, medium crystalline.
3050 - 3060	DOLOSTONE, as above.
3060 - 3070	DOLOSTONE, as above.
3070 - 3080	DOLOSTONE, (85%), as above. DOLOSTONE (10%), very pale orange (10YR 8/2), hard, low vuggy macroporosity, the vugs are not interconnected and apparent permeability is very low, vugs are lined with crystals, conchoidal fracture. SILT, (5%), dusky yellow green (5GY 5/2), stiff, clayey.
3080 - 3090	DOLOSTONE, light brownish gray to pale brown (10YR 6/2 to 10YR 6/3), fine to medium grained crystal structure and fragments of CLAY, greenish gray (GLE Y1 6/5G), soft.
3090 - 3100	DOLOSTONE, pale brown (10YR 6/3), medium to coarse grained crystal structure, high intergranular porosity, and fragments of CLAY greenish gray (GLE Y1 6/5G), soft.
3100 - 3110	DOLOSTONE, light brownish gray (10YR 6/2) very hard, fine crystalline, low porosity.
3110 - 3120	DOLOSTONE (60%), light gray (10YR 7/1), very hard, fine sucrosic texture, low porosity DOLOSTONE (40%), pale brown (10YR 6/3), hard, fine crystalline.
3120 - 3130	DOLOSTONE (100%) light gray rock as above.
3130 - 3140	DOLOSTONE (75%) light gray rock as above. DOLOSTONE (25%) brown (10YR 5/3), hard, irregular fracture, coarse sucrosic texture, appears to have formed in fractures in the light gray dolostone.

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3140 - 3150	DOLOSTONE (60%) light gray rock as above. DOLOSTONE (30%) pale brown (10YR 6/3), hard, fine crystalline, sucrosic texture, low porosity. DOLOSTONE (10%) brown rock as above. Also, some CLAY greenish gray (GLE1 6/5G), soft.
3150 - 3160	DOLOSTONE (90%) light gray rock as above. DOLOSTONE (10%) brown rock as above.
3160 - 3170	DOLOSTONE (100%) light gray rock as above.
3170 - 3180	DOLOSTONE (90%) light gray (10YR 7/1) very hard, poor conchoidal fracture, very fine sucrosic texture, some vuggy and fracture macroporosity. DOLOSTONE (10%) grayish brown (10YR 5/2) very hard, irregular to poor conchoidal fracture, fine sucrosic texture, some vuggy and fracture macroporosity.
3180 - 3190	DOLOSTONE (90%) light gray rock as above. DOLOSTONE (10%) brown rock as above.
3190 - 3200	DOLOSTONE (50%) light gray rock as above. DOLOSTONE (50%) brown rock as above.
3200 - 3210	DOLOSTONE (90%) light gray rock as above. DOLOSTONE (10%) brown rock as above. Note that the brown rock appears to have formed lining fractures in the light gray rock.
3210 - 3220	DOLOSTONE (50%) light gray (10YR 7/1) very hard, poor conchoidal fracture, very fine sucrosic texture, some vuggy and fracture macroporosity. DOLOSTONE (50%) brown (10YR 5/3), hard, fine to coarse recrystallization abundant in fractures of light gray dolostone.
3220 - 3230	DOLOSTONE (80%) light gray rock as above. DOLOSTONE (20%) brown rock as above.
3230 - 3240	DOLOSTONE (80%) light gray rock as above. DOLOSTONE (20%) brown rock as above.
3240 - 3250	DOLOSTONE (20%) light gray rock as above. DOLOSTONE (80%) brown rock as above.
3250 - 3260	DOLOSTONE, brown (10YR 4/3) very hard, conchoidal fracture, low macroporosity,
3260 - 3270	DOLOSTONE, brown rock as above.
3270 - 3280	DOLOSTONE (100%) light grayish brown (10YR 6/2) to grayish brown (10YR 5/2) very hard, poor conchoidal fracture, fine to very fine sucrosic texture, some fracture macroporosity.
3290 - 3300	DOLOSTONE (50%), grayish brown rock as above DOLOSTONE (50%), brown (10YR 4/3), very fine sucrosic texture, very hard, small vuggy macroporosity.
3300 - 3310	DOLOSTONE, very dark gray and brown (10YR 3/1 and 10YR 4/3), very hard, fine sucrosic

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	texture with fine to medium grained recrystallization.
3310 - 3320	DOLOSTONE (100%) gray (10YR 5/1) very hard, poor conchoidal fracture, fine sucrosic texture, some fracture macroporosity.
3320 - 3330	DOLOSTONE (100%) dark grayish brown (10YR 4/2) very hard, poor conchoidal fracture, fine sucrosic texture, good fracture macroporosity.
3330 - 3340	DOLOSTONE (100%) dark gray (10YR 4/1), brown (10YR 4/3), and light gray (10YR 7/1) very hard, irregular to poor conchoidal fracture, fine to very fine sucrosic texture, some fracture macroporosity.
3340 - 3350	DOLOSTONE (100%) light gray as above.
3350 - 3360	DOLOSTONE (100%) dark gray, brown, and light gray rock as above.
3360 - 3370	DOLOSTONE, light brownish gray (10YR 6/2) and very dark gray (10YR 3/1), 80% very low macroporosity microcrystalline, 20% very high intergranular macroporosity coarsely sucrosic, hard, conchoidal fracture, high apparent permeability.
3370 - 3380	DOLOSTONE, light brownish gray (10YR 6/2) and very dark gray (10YR 3/1), 95% very low macroporosity microcrystalline, 5% very high intergranular macroporosity coarsely sucrosic, hard, conchoidal fracture.
3380 - 3390	DOLOSTONE, light brownish gray (10YR 6/2) and very dark gray (10YR 3/1), hard, very low vuggy macroporosity, microcrystalline, conchoidal fracture.
3390 - 3400	DOLOSTONE, light brownish gray (10YR 6/2) hard, low vuggy macroporosity, finely crystalline.
3400 - 3410	DOLOSTONE, light brownish gray (10YR 6/2) to dusky yellowish brown (10YR 2/2), hard to moderately hard, moderate vuggy macroporosity, fine to medium crystalline.
3410 - 3420	DOLOSTONE, light brownish gray (10YR 6/2), hard, moderate to high vuggy macroporosity, medium crystalline.
3420 - 3430	DOLOSTONE, as above.
3430 - 3440	DOLOSTONE, light brownish gray (10YR 6/2), hard to moderately hard, moderate vuggy macroporosity, fine to medium crystalline.
3440 - 3450	DOLOSTONE, as above.
3450 - 3460	DOLOSTONE, brown (10YR 5/3), hard, low intergranular macroporosity, finely crystalline, conchoidal fracture.
3460 - 3470	DOLOSTONE, grayish brown (10YR 5/2), hard, microcrystalline, very low macroporosity, conchoidal fracture.
3470 - 3480	DOLOSTONE, gray (10YR 5/1), hard, finely crystalline, low intergranular macroporosity.
3480 - 3490	DOLOSTONE, grayish orange (10YR 7/4), hard, fine to medium crystalline, high vuggy macroporosity.
3490 - 3500	DOLOSTONE, as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
0 - 10	SAND (100%): grayish brown (10YR 5/2), surface fill, generally fine grained.
10 - 20	SAND (100%): light gray (10YR 5/2), fine to coarse, poorly sorted, mostly subrounded, approximately 70% quartz grains and 30% carbonate grains, mollusk fragments.
20 - 30	SAND (100%): yellowish gray (5Y 8/1), approximately 50% quartz, fine, moderately sorted, subrounded to rounded, with trace of dark minerals; approximately 50% carbonate grains, moderate to coarse, moderately sorted, mollusk fragments.
30 - 40	LIMESTONE (100%): white (10YR 8/1) hard grainstone with fine to coarse shell fragments and abundant fine subangular quartz grains in dense calcite cement. Some moldic porosity. Few fine black phosphate grains.
40 - 50	SANDSTONE (100%): light gray (10YR 7/2), hard to very hard, quartz rich, some calcite cementation, medium moldic macroporosity.
50 - 60	SANDSTONE (100%): light gray (10YR 7/2), hard to very hard, moderately well sorted, less cementation than above.
60 - 70	SHELLY QUARTZ SANDSTONE (100%): light gray (10YR 7/2) hard, medium-grained sub-angular quartz with shell fragments. Low intergranular macroporosity. Some black to brown phosphate grains
70 - 80	SHELLY QUARTZ SANDSTONE (100%): as above.
80 - 90	SANDY LIMESTONE (100%): white (10YR 8/1) hard, coarse-grained packstone with low intergranular macroporosity. Some fine to medium brown and black phosphate grains.
90 - 100	SANDY LIMESTONE (100%): light gray (7.5 YR 7/2) hard, coarse grainstone with almost 50 percent subrounded quartz grains. Low intergranular macroporosity. Some fine brown and black phosphate grains.
100 - 110	SANDY LIMESTONE (100%): light gray (2.5Y 7/1) moderately hard very coarse grainstone with some subrounded quartz and abundant large broken shell fragments. Good intergranular macro porosity. Few fine black phosphate grains.
110 - 120	SANDY LIMESTONE (100%): as above.
120 - 130	SANDY LIMESTONE (100%): white (10YR 8/1), very hard, dense calcite cementation and large abundant shell fragments, large cutting fragments. Some moldic porosity.
130 - 140	SILT (100%): light gray (5Y 7/2), fine grained, very sandy, some shell fragments, some dark phosphate grains.
140 - 150	SILT (100%): light gray (5Y 7/2), fine grained, much more abundant shell fragments than above (approximately 40%), mollusks, some fine dark phosphate grains.
150 - 160	SILT (100%): as above.
160 - 170	SILT (100%): light gray (5Y 7/2), fine grained, very sandy, some shell fragments, some dark phosphate grains.
170 - 180	SANDY SHELLEY CLAY (100%): dark greenish gray (GLEY 1 4/1), sandy, slightly plastic, low intergranular porosity, mollusk fragments, shell fragments.
180 - 190	SHELLEY CLAY (100%): dark greenish gray (GLEY 1 4/1), very fine, less sandy than above, more plastic, mollusk fragments, shell fragments.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
190 - 200	SHELLEY CLAY (100%): as above.
200 - 210	SHELLEY CLAY (100%): as above.
210 - 220	SILT (100%): greenish gray (GLEY 1 6/1), sandy, some clay (10%), abundant shell fragments (15%), dark phosphate grains.
220 - 230	SHELLY CLAYEY SAND (100%): greenish gray (GLEY1 5/2) loose, fine, subangular quartz grains with some larger shell fragments and some very fine black phosphate grains.
230 - 240	SHELLY CLAYEY SAND (100%): as above.
240 - 250	SHELLY CLAYEY SAND (100%): as above.
250 - 260	SHELLY CLAYEY SAND (50%): as above. SANDY LIMESTONE (50%): light gray (7.5YR 5/1) hard coarse grainstone with abundant medium quartz grains and some fine black phosphate grains.
260 - 270	SILTY SAND (100%): greenish gray (GLEY1 5/2) loose fine subangular quartz grains with some medium shell fragments and fine black phosphate grains.
270 - 280	SHELLY CLAYEY SAND (100%): gray (GLEY1 5/1) loose fine subangular quartz grains with some medium shell fragments and fine black phosphate grains.
280 - 290	SHELLY CLAYEY SAND (100%): as above.
290 - 300	SHELLY CLAYEY SAND (100%): as above.
300 - 310	CLAYEY SILT (100%): dark gray (GLEY1 4/1) loose silt-sized quartz grains with occasional fine shell fragments and some very fine black phosphate grains.
310 - 320	CLAYEY SILT (100%): as above.
320 - 330	CLAYEY SILT (100%): as above.
330 - 340	CLAYEY SILT (100%): as above.
340 - 350	CLAYEY SAND (100%): gray (GLEY1 5/1) loose very fine to fine subangular quartz with some very fine black phosphate grains.
350 - 360	CLAYEY SAND (100%): as above.
360 - 370	CLAYEY SAND (100%): as above.
370 - 380	CLAYEY SAND (100%): as above.
380 - 390	CLAYEY SAND (100%): as above.
390 - 400	CLAYEY SAND (100%): as above.
400 - 410	SILTY SANDY CLAY (100%): gray (GLEY1 5/1), loose very fine to find subangular quartz with more abundant black phosphate grains.
410 - 420	CLAYEY SILT (100%): Very dark greenish gray (GLEY 1 3/1), very abundant fine dark phosphate grains and very fine quartz sand
420 - 430	SILTY LIMESTONE (100%): light greenish gray (GLEY 1 7/1), mudstone, variable hardness, very low macroporosity, very silty, marly, very fine phosphate.
430 - 440	SILTY LIMESTONE (100%): as above.
440 - 450	SILTY LIMESTONE (100%): as above.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
450 - 460	SILTY LIMESTONE (100%): light greenish gray (GLEY 1 7/1), mudstone, variable hardness, very low macroporosity, lower clay component than above.
460 - 470	SILTY LIMESTONE (100%): as above
470 - 480	SILTY LIMESTONE (75%): light greenish gray (GLEY 1 7/1), mudstone, variable hardness, clayey. SANDY CLAY (25%) greenish gray (GLEY1 4/2) slightly plastic clay with abundant very fine and fine quartz grains and some fine black phosphate grains.
480 - 490	SANDY LIMESTONE (75%): greenish gray (GLEY1 6/2) slightly friable packstone with fine quartz grains and large broken shell fragments and some very fine black phosphate grains. SANDY CLAY (25%): as above.
490 - 500	LIMESTONE (100%): white (10YR 8/1), friable coarse grainstone.
500 - 510	LIMESTONE (100%): as above.
510 - 520	SANDY LIMESTONE (100%): light gray (10YR 7/1), friable medium grainstone with some fine to medium quartz grains and some fine black phosphate grains.
520 - 530	SANDY LIMESTONE (100%): as above.
530 - 540	SANDY LIMESTONE (100%): (light gray (5Y 7/1), moderately hard, medium-grained packstone with fine quartz grains and some fine black phosphate grains.
540 - 550	SANDY LIMESTONE (100%): as above.
550 - 560	LIMESTONE (100%) white (2.5Y 8/1), slightly friable, medium-grained packstone with some fine black phosphate grains.
560 - 570	LIMESTONE (100%) as above.
570 - 580	SANDY LIMESTONE (100%) light gray (10YR 7/1), slightly friable fine to medium grainstone. Fine black phosphate grains are common.
580 - 590	SANDY LIMESTONE (100%): as above.
590 - 600	SANDY LIMESTONE (100%): light gray (10 YR 7/1), slightly friable fine to medium grainstone. Fine black phosphate grains are common. Clayey, sandy,
600 - 610	CLAYEY LIMESTONE (100%): light greenish gray (GLEY 1 8/1), friable, wackestone, mollusks/fragments, trace of silt size phosphate.
610 - 620	CLAY (100%): light greenish gray (GLEY 1 8/1), sticky, abundant limestone fragments, as above, trace of silt-size phosphate.
620 - 630	CLAY (100%): as above.
630 - 640	CLAYEY LIMESTONE (100%): light greenish gray (GLEY 1 8/1), friable, wackestone, mollusks/fragments, trace of silt size phosphate.
640 - 650	CLAYEY LIMESTONE (100%): as above.
650 - 660	CLAY (100%): light greenish gray (GLEY 1 8/1), sticky, abundant limestone fragments, as above, trace of silt-size phosphate.
660 - 670	CLAY (100%): light greenish gray (GLEY 1 8/1), sticky, few limestone fragments, trace of

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	silt-size phosphate.
670 - 680	SILTY CLAY (100%): light greenish gray (GLEY 1 8/1), sticky, silty, sandy, silt-size phosphate.
680 - 690	MARL (50%) light gray (5Y 7/1), soft, slightly plastic, some fine to medium quartz grains and fine black phosphate grains. LIMESTONE (50%) light gray (10YR 7/1) moderately hard, poorly sorted grainstone with some medium quartz grains and fine black phosphate grains.
690 - 700	LIMESTONE (50%) as above. MARL (50%)
700 - 710	LIMESTONE (75%) as above. MARL (25%)
710 - 720	LIMESTONE (100%) light gray rock as above.
720 - 730	LIMESTONE (50%) light gray rock as above. SANDY MARL (50%) light gray (5Y 7/1) soft, slightly plastic, fine to medium quartz grains are common, some fine black phosphate grains.
730 - 740	LIMESTONE (50%) light gray (5Y 7/1) slightly friable medium to coarse-grained packstone with good moldic macroporosity and some fine black phosphate grains. MARL (50%) light gray (5Y 7/1) soft and slightly plastic with some quartz grains and fine black phosphate.
740 - 750	MARL (75%) as above. LIMESTONE (25%) as above.
750 - 760	MARL (50%) as above. LIMESTONE (50%) as above.
760 - 770	MARL (100%) light gray (5Y 7/1) soft, plastic uniform, some fine black phosphate grains.
770 - 780	MARL (100%) light gray (5Y 7/1) soft, plastic uniform.
780 - 790	MARL (97%) light gray (5Y 7/1) soft, plastic uniform, 3% silt size black phosphate grains.
790 - 800	LIMESTONE (67%) yellowish gray (5Y 7/2) grainstone to packstone, soft, moderate intergranular macroporosity, low apparent permeability because pore space is filled with silt and marl (30%), silt size phosphate grains (3%).
800 - 810	MARL (100%) light gray (5Y 7/1) soft, plastic uniform, some fine black phosphate grains.
810 - 820	LIMESTONE (100%) yellowish gray (5Y 7/2) grainstone to packstone, soft, moderate intergranular macroporosity, low apparent permeability because pore space is filled with silt and marl, peloids.
820 - 830	LIMESTONE (100%) yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), grainstone to packstone, soft, moderate intergranular macroporosity, low apparent permeability because pore space is filled with silt and marl, peloids.
830 - 840	LIMESTONE (100%) yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), grainstone to packstone, soft, moderate intergranular macroporosity, low apparent permeability because pore space is filled with silt and marl, peloids.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
840 - 850	LIMESTONE (100%) yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), grainstone to packstone, soft, moderate intergranular macroporosity, low apparent permeability because pore space is filled with silt and marl, peloids.
850 - 860	LIMESTONE (100%) yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), grainstone, moderately hard, moderate intergranular macroporosity, silt, marl, peloids, mollusks.
860 - 870	LIMESTONE (100%) yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), grainstone, moderately hard, moderate intergranular macroporosity, silt, marl, peloids, mollusks.
870 - 880	LIMESTONE (100%) yellowish gray (5Y 8/1), grainstone to wackestone, hard to moderately hard, moderate intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.
880 - 890	SILT (75%), yellowish gray (5Y 8/1), soft, marly, clayey. LIMESTONE (25%) yellowish gray (5Y 8/1), grainstone to wackestone, hard to moderately hard, moderate intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.
890 - 900	SILT (100%), pale olive (10Y 6/2), soft, sticky, clayey.
900 - 910	SILT (100%), pale olive (10Y 6/2), soft, sticky, clayey, limestone fragments.
910 - 920	MARL (95%), yellowish gray (5Y 7/2), silty, slightly cohesive, sticky, limestone fragments.
920 - 930	LIMESTONE (100%), white to light gray (N7 to N9), very soft, sandy, wackestone/packstone, fine grained phosphates, mollusks.
930 - 940	LIMESTONE (100%), white to light gray (N7 to N9), very soft, sandy, wackestone/packstone, fine grained phosphates, mollusks.
940 - 950	LIMESTONE (100%), white to light gray (N7 to N9), very soft, sandy, wackestone/packstone, fine grained phosphates, mollusks.
950 - 960	SILT (100%), light olive gray (5Y 5/2), soft, sticky, clayey, limestone fragments.
970 - 980	MARL (100%), yellowish gray (5Y 8/1), silty, slightly cohesive, sticky, limestone fragments.
980 - 990	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
990 - 1000	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
1000 - 1010	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
1010 - 1020	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
1020 - 1030	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
1030 - 1040	CLAY (100%), light olive gray (5Y 5/2), soft, sticky, silty, limestone fragments.
1040 - 1050	LIMESTONE (100%) yellowish gray (5Y 7/2), grainstone to wackestone, moderately hard, moderate intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.
1050 - 1060	LIMESTONE (100%) yellowish gray (5Y 7/2), grainstone to wackestone, moderately hard, moderate to high vuggy, intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.
1060 - 1070	LIMESTONE (100%) yellowish gray (5Y 7/2), grainstone to wackestone, moderately hard, moderate to high vuggy, intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1070 - 1080	LIMESTONE (100%) yellowish gray (5Y 7/2), grainstone to wackestone, moderately hard, moderate to high vuggy, intergranular and vuggy macroporosity, silt, marl, peloids, mollusks.
1080 - 1090	LIMESTONE (100%) yellowish gray (5Y 8/1), wackestone, moderately hard, moderate to high moldic and vuggy macroporosity, forams, sand, peloids, mollusks.
1090 - 1100	LIMESTONE (100%) yellowish gray (5Y 8/1), grainstone, moderately hard to soft, low intergranular macroporosity, forams, sand, peloids, mollusks.
1100 - 1110	LIMESTONE (100%) yellowish gray (5Y 7/2), wackestone, moderately hard, moderate moldic macroporosity, peloids, mollusks, less than 1% very fine phosphate.
1110 - 1120	LIMESTONE (100%) yellowish gray (5Y 8/1), grainstone, moderately hard to soft, low intergranular macroporosity, forams, sand, peloids, mollusks, fine grained phosphate.
1120 - 1130	LIMESTONE (50%) yellowish gray (5Y 7/2), wackestone, moderately hard, moderate moldic macroporosity, peloids, mollusks. DOLOSTONE (50%) grayish olive (10Y 4/2), hard, finely crystalline, sucrosic, moderate vuggy macroporosity.
1130 - 1140	LIMESTONE (90%) yellowish gray (5Y 8/1), wackestone, moderately hard, moderate moldic macroporosity, peloids, mollusks. DOLOSTONE (10%) grayish olive (10Y 4/2), hard, finely crystalline, sucrosic, moderate vuggy macroporosity.
1140 - 1150	LIMESTONE (100%) yellowish gray (5Y 8/1), grainstone, moderately hard to soft, moderate intergranular and moldic macroporosity, forams, peloids, mollusks.
1150 - 1160	LIMESTONE (100%) yellowish gray (5Y 8/1), grainstone, moderately hard to soft, moderate intergranular and moldic macroporosity, forams, peloids, mollusks.
1160 - 1170	LIMESTONE (50%) yellowish gray (5Y 8/1), grainstone, moderately hard to soft, moderate intergranular and moldic macroporosity, forams, peloids, mollusks. DOLOSTONE (50%) grayish olive (10Y 4/2), hard, finely crystalline to microcrystalline, moderate vuggy macroporosity.
1170-1180	LIMESTONE (100%) yellowish gray (5Y8/1) grainstone, moderately hard to soft, moderate intragranular and vuggy macroporosity, peloids
1180-1190	LIMESTONE (100%) very pale brown (10Y8/2) grainstone, moderately hard to soft, moderate intergranular macroporosity, peloids
1190-1200	LIMESTONE (100%) very pale brown (10YR 8/2) grainstone, moderately hard to soft, vuggy macroporosity, peloids
1200-1210	LIMESTONE (100%) very pale brown (10YR8/2) grainstone, moderately hard to soft, vuggy macroporosity, peloids
1210-1220	LIMESTONE (100%) as above.
1220 - 1230	LIMESTONE (100%) white (10YR 8/1) moderately friable grainstone, medium-grain size, with some large forams and gastropod shell fragments, high intergranular and moldic macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1230 - 1240	LIMESTONE (100%) white (10YR 8/1) moderately friable grainstone, medium grain size, high intergranular and moldic macroporosity.
1240 - 1250	LIMESTONE (100%) as above.
1250 - 1260	LIMESTONE (100%) as above.
1260 - 1270	LIMESTONE (100%) pinkish gray (7.5YR 7/2) moderately friable grainstone, coarse grain size, high intergranular and moldic macroporosity.
1270 - 1280	LIMESTONE (100%) as above.
1280 - 1290	LIMESTONE (100%) as above.
1290 - 1300	LIMESTONE (100%) light gray (7.5YR 7/1) slightly friable grainstone, medium to coarse grain size, high intergranular and moldic macroporosity.
1300 - 1310	LIMESTONE (100%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse grain size,, high intergranular and moldic macroporosity.
1310 - 1320	LIMESTONE 100%) as above.
1320 - 1330	LIMESTONE (100%) as above.
1330 - 1340	LIMESTONE (100%) light gray (10YR 7/2) slightly friable grainstone, medium grain size, good intergranular and moldic macroporosity.
1340 - 1350	LIMESTONE (100%) as above.
1350 - 1360	LIMESTONE (100%) as above.
1360 - 1370	LIMESTONE (100%) as above.
1370 - 1380	LIMESTONE (100%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse gran size, high intergranular and moldic macroporosity.
1380 - 1390	LIMESTONE (100%) as above.
1390 - 1400	LIMESTONE (100%) as above.
1400 - 1410	LIMESTONE (90%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse grain size, high intergranular and moldic macroporosity. LIMESTONE (10%) light gray (10YR 7/1) hard grainstone with some recrystallization, good intergranular and moldic macroporosity.
1410 - 1420	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1420 - 1430	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1430 - 1440	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1440 - 1450	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1450 - 1460	LIMESTONE (100%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse grain size, high intergranular and moldic macroporosity.

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DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1460 - 1470	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1470 - 1480	LIMESTONE (90%) pinkish gray rock as above. LIMESTONE (10%) light gray rock as above.
1480 - 1490	LIMESTONE (90%) light gray, (10YR7/2) moderately friable grainstone, fine to med grain size, high intergranular and moldic macro porosity LIMESTONE (10%) light gray (10YR7/2) hard grainstone with some recrystallization, intergranular and moldic macroporosity
1490-1500	LIMESTONE (80%) light yellowish brown (10YR6/4), moderately friable grainstone, medium to coarse grainsize, hight intergranular and moldic macroporosity LIMESTONE (20%) light gray (10YR7/2) hard grainstone with recrystallization, moderate intergranular porosity
1510-1520	LIMESTONE (90%) very pale brown rock as above. LIMESTONE (10%) light gray rock as above.
1520-1530	LIMESTONE (60%) very pale brown (10YR7/4) moderately friable grainstone, med to coarse grainsize, high intergranular and moldic macroporosity LIMESTONE (40%) light gray (10YR7/2) hard grainstone with recrystallization, high intergranular macroporosity, trace gray clay.
1530-1540	LIMESTONE (90%) very pale brown (10YR7/3) moderately friable grainstone, med to coarse grain size, high intergranular and moldic macroporosity LIMESTONE (10%) light gray (10YR7/2) hard grainstone with some recrystallization, good intergranular macroporosity
1540-1550	LIMESTONE (70%) very pale brown rock, same as above LIMESTONE (30%) light gray rock, same as above
1550-1560	LIMESTONE (90%) very pale brown rock, same as above LIMESTONE (10%) pale brown (10YR6/3) hard grainstone with high recrystallization, low intergranular and moldic porosity
1560-1570	LIMESTONE (90%) very pale brown rock (10YR7/3) same as above LIMESTONE (10%) very pale brown (10YR8/2) hard grainstone with high crystallization, low intergranular and moldic porosity CLAY trace light gray (10YR7/2) soft
1570-1580	LIMESTONE (90%) very pale brown (10YR7/3) same as above LIMESTONE (10%) light gray (10YR7/2) same as above Clay trace light gray (2.5YR7/2)
1580-1590	LIMESTONE light yellowish brown (10YR6/4) moderately friable grainstone, med to coarse grain size, med intergranular and moldic macroporosity, trace iron in veins, trace marble? forams
1590-1600	LIMESTONE (70%) very pale brown (10YR7/3) moferately friable grainstone, med to coarse

LITHOLOGIC LOG

WELL: MW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	grain size, high intergranular and moldic macroporosity LIMESTONE (20%) gray (10YR6/1) to very dark gray (10YR3/1), fine grained, recrystallized LIMESTONE (10%) light grayish brown (10YR6/2) fine grained, recrystallized
1600-1610	LIMESTONE very pale brown (10YR7/3) moderately friable grainstone, med to coarse grainsize, high intergranular and moldic macro porosity, trace gray recrystallized limestone from above
1610-1620	LIMESTONE (80%) very pale brown (10YR7/3) moderately friable grainstone, med to coarse grainsize, high intergranular and moldic macro porosity LIMESTONE (10%) dark gray (10YR4/1) recrystallized fine grained LIMESTONE (10%) grayish brown (2.5Y8/4) boundstone, moderately friable grainsstone, high intergranular and moldic macroporosity, forams
1620-1630	LIMESTONE (50%) pale yellow (2.5Y8/1) moderately friable grainstone, soft to hard LIMESTONE (50%) gray (10YR4/1) wackestone hard, recrystallized moderate vuggy macroporosity mollusks
1630-1640	LIMESTONE white to pale yellow (2.5Y8/1) to (2.5Y7/3) wackestone to grainstone, soft to hard, moderate vuggy macroporosity, recrystallized, peloids
1640-1650	LIMESTONE (90%) very pale brown (10YR7/3) very hard to moderately hard grainstone, packestone, moderate vuggy macroporosity mollusks LIMESTONE (10%) light gray (2.5Y7/2) very hard rechrystallized grainstone
1650-1660	LIMESTONE pale yellow (10YR7/4) moderately friable grainstone med to coarsed grained, to harder wackestone recrystallized peloids, mollusks
1660-1670	LIMESTONE (95%) pale brown (10YR6/3) moderately friable grainstone, med to coarse grained LIMESTONE (5%) very dark brown (10YR2/2) packstone thin layer, fine grained slight recrystallization, weak
1670-1680	LIMESTONE (70%) very pale brown (10YR7/3) grainstone to packestone, soft to moderate hardness, moderate vuggy macroporosity LIMESTONE (30%) light gray (2.5Y7/2) very hard recrystallized, some vuggy macroporosity, mollusks, trace gray clay layer
1680-1690	LIMESTONE (60%) very pale brown (10YR7/3) to pale brown (10YR6/3) packstone, moderately hard high vuggy macroporosity LIMESTONE (40%) light gray (2.5Y7/2) packstone very hard recrystallized
1690-1700	LIMESTONE (60%) pale yellow (2.5Y8/2) packestone moserately hard, medium vuggy macroporosity, peloids, trace grainstone LIMESTONE (40%) light brownish gray (2.5Y6/2) mudstone fine to medium grained, very hard, some recrystallization some vuggy macroporosity
1700 - 1710	LIMESTONE (50%) white (10YR 8/1) moderately hard packstone, vuggy macroporosity, peloids. LIMESTONE (50%) pale yellow (2.5Y 8/2) slightly friable grainstone, medium grain size,

LITHOLOGIC LOG

WELL: MW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	good intergranular and moldic macroporosity
1710 - 1720	LIMESTONE (40%) light gray (10YR 7/2) slightly friable grainstone, medium to coarse grain size, high intergranular and moldic macroporosity. LIMESTONE (40%) white (10YR 8/1) hard recrystallized grainstone with some vuggy macroporosity. LIMESTONE (20%) dark gray (10YR 3/1) hard recrystallized grainstone with some vuggy macroporosity.
1720 - 1730	LIMESTONE (100%) pale yellow (2.5Y 8/3) slightly friable, slightly recrystallized grainstone with some intergranular and vuggy macroporosity.
1730 - 1740	LIMESTONE (80%) pale yellow rock as above. LIMESTONE (20%) light gray (2.5Y 7/2) hard recrystallized grainstone with some vuggy macroporosity.
1740 - 1750	LIMESTONE (60%) gray (2.5Y 6/1) to dark gray (2.5Y 4/1) hard recrystallized rock with poor conchoidal fracture and some vuggy macroporosity. LIMESTONE (40%) light gray rock as above.
1750 - 1760	LIMESTONE (50%) pinkish gray (7.5YR 7/2) to light brownish gray (10YR 6/2) slightly friable grainstone with medium to coarse grain size and good intergranular and moldic macroporosity. LIMESTONE (50%) light gray (2.5Y 7/1) hard recrystallized grainstone with some vuggy macroporosity.
1760 - 1770	LIMESTONE (75%) friable pinkish gray rock as above. LIMESTONE (25%) hard light gray rock as above.
1770 - 1780	LIMESTONE (90%) friable pinkish gray rock as above. LIMESTONE (10%) hard light gray rock as above.
1780 - 1790	LIMESTONE (60%) friable pinkish gray rock as above. LIMESTONE (40%) very pale brown (10YR 8/2) friable packstone with fine to medium grain size, some intergranular and moldic macroporosity.
1790 - 1800	LIMESTONE (60%) pinkish gray rock as above. LIMESTONE (20%) very pale brown rock as above. LIMESTONE (20%) light gray (2.5Y 7/2) hard, recrystallized rock with poor conchoidal fracture and some vuggy macroporosity.
1800 - 1810	LIMESTONE (80%) light gray (10YR 7/2) friable grainstone with medium grain size and good intergranular and moldic macroporosity. LIMESTONE (20%) very pale brown (10YR 8/2) slightly friable packstone with fine grain size and some intergranular macroporosity.
1810 - 1820	LIMESTONE (80%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse grain size, good intergranular macroporosity. LIMESTONE (20%) gray (10YR 6/1) slightly friable grainstone, medium grain size, good intergranular macroporosity.

LITHOLOGIC LOG

WELL: MW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
1820 - 1830	As above.
1830 - 1840	As above.
1840 - 1850	As above.
1850 - 1860	LIMESTONE (50%) pinkish gray (7.5YR 7/2) slightly friable grainstone, medium to coarse grain size, good intergranular macroporosity. LIMESTONE (50%) very pale brown (10YR 7/3) slightly friable grainstone, fine to medium grain size, good intergranular macroporosity.
1860 - 1870	As above.
1870 - 1880	As above.
1880 - 1890	LIMESTONE (40%) pinkish gray rock as above. LIMESTONE (40%) very pale brown rock as above. LIMESTONE (20%) light gray (10YR 7/1 to gray (10YR 5/1) hard recrystallized rock with poor conchoidal fracture, some vuggy macroporosity
1890 - 1900	LIMESTONE (100%) light gray (10YR 7/1) to gray (10YR 6/1) slightly friable grainstone, fine to coarse grain size, good intergranular macroporosity,
1900 - 1910	LIMESTONE (100%) light gray rock as above.
1910 - 1920	LIMESTONE (80%) very pale brown (10YR 7/3) slightly friable grainstone, coarse grain size, very good intergranular macroporosity. LIMESTONE (20%) light gray (10YR 7/2) to gray (10YR 6/1) hard recrystallized rock with poor conchoidal fracture, some vuggy macroporosity.
1920 - 1930	LIMESTONE (80%) very pale brown rock as above. LIMESTONE (20%) gray rock as above.
1930 - 1940	LIMESTONE (80%) very pale brown rock as above. LIMESTONE (20%) gray rock as above.
1940 - 1950	LIMESTONE (100%) yellowish gray (5Y 8/1), wackestone, hard, moderate vuggy macroporosity, sandy, forams, mollusks.
1950 - 1960	LIMESTONE (100%) very pale orange (10YR 8/2), grainstone, soft, low intergranular macroporosity, sandy, peloids, forams, mollusks.
1960 - 1970	LIMESTONE (100%) very pale orange (10YR 8/2), grainstone, soft, low intergranular macroporosity, sandy, peloids, forams, mollusks.
1970 - 1980	LIMESTONE (100%) very pale orange (10YR 8/2), grainstone, soft, low intergranular macroporosity, sandy, peloids, forams, mollusks.
1980 - 1990	LIMESTONE (100%) very pale orange (10YR 8/2), grainstone, soft, low intergranular macroporosity, sandy, peloids, forams, mollusks.
1990 - 2000	LIMESTONE (100%) very pale orange (10YR 8/2), grainstone, moderately hard, low intergranular macroporosity, sandy, peloids.
2000 - 2010	LIMESTONE (100%): as above.
2010 - 2020	LIMESTONE (100%): very pale brown (10YR 8/2), grainstone, friable, moderate

LITHOLOGIC LOG

WELL: MW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
	intergranular macroporosity, small shell fragments.
2020 - 2030	LIMESTONE (100%): very pale brown (10YR 8/2), grainstone, friable, moderate intergranular macroporosity, sandy.
2030 - 2040	LIMESTONE (100%): very pale brown (10YR 8/2), grainstone, moderately hard, moderate to high intergranular macroporosity, less sandy than above, shell fragments, some large.
2040 - 2050	LIMESTONE (100%): as above.
2050 - 2060	LIMESTONE (100%): as above.
2060 - 2070	LIMESTONE (100%): as above.
2070 - 2080	LIMESTONE (90%): very pale brown (10YR 8/2), grainstone, moderately hard, moderate to high intergranular macroporosity, sand, peloids, shell fragments. LIMESTONE (10%): light olive gray (5Y 6/1) to olive gray (5Y 4/1), wackestone, hard, moderate vuggy macroporosity, sand, shell fragments, slightly sucrosic texture, but reacts as limestone to dilute HCl and alizerine red.
2080 - 2090	LIMESTONE (90%): very pale brown (10YR 8/2), grainstone, moderately hard, moderate to high intergranular macroporosity, sand, peloids, .
2090 - 2100	LIMESTONE (100%) very pale brown (10YR 8/2), grainstone, moderately hard, moderate to high intergranular macroporosity, sand, peloids.
2100 - 2110	LIMESTONE (100%) yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), grainstone, soft to moderately hard, moderate intergranular macroporosity, sand, peloids, silt.
2110 - 2120	LIMESTONE (100%) yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2), grainstone, soft to moderately hard, moderate intergranular macroporosity, sand, peloids, silt.
2120 - 2130	LIMESTONE (100%) very pale brown (10YR 8/2) and some gray (10YR 6/1), grainstone, friable, moderate intergranular porosity, sandy.
2130 - 2140	LIMESTONE (100%): as above.
2140 - 2150	LIMESTONE (100%): as above.
2150 - 2160	LIMESTONE (100%): very pale brown (10YR 8/2) and some gray (10YR 6/1) grainstone, friable, moderate intergranular porosity, sandy and few off-scale white, very hard, fragments.
2160 - 2170	LIMESTONE (100%): very pale brown (10YR 8/2) and some gray (10YR 6/1) grainstone, softer than above, friable, lower but moderate intergranular porosity, sandy.
2170 - 2180	LIMESTONE (100%): as above.
2180 - 2190	LIMESTONE (100%): as above.
2190 - 2200	LIMESTONE (100%): as above.
2200 - 2210	LIMESTONE (100%): very pale brown (10YR 8/2) and some gray (10YR 6/1) grainstone, moderately hard, some intergranular porosity, off-scale white, very hard, fragments.
2210 - 2220	LIMESTONE (100%): as above.
2220 - 2230	LIMESTONE (100%): very pale brown (10YR 8/2) and some gray (10YR 6/1) grainstone,

LITHOLOGIC LOG	
WELL: MW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC

LITHOLOGIC LOG	
WELL: MW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC

LITHOLOGIC LOG	
WELL: MW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC

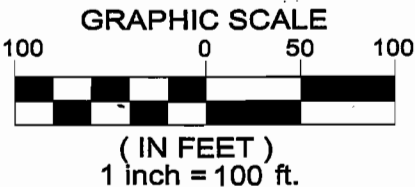
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WELL: MW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC

LITHOLOGIC LOG	
WELL: MW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC

[illegible]

Appendix F

**SPECIFIC PURPOSE
SURVEY**



PREPARED FOR:
YOUNGQUIST BROTHERS, INC.

SURVEYOR'S REPORT:
THIS IS NOT A BOUNDARY SURVEY.

THIS SPECIFIC PURPOSE SURVEY WAS PREPARED FOR THE PURPOSE OF SHOWING APPROXIMATE LOCATION OF EXISTING WELLS AT THE SITE AND ELEVATIONS.

EXISTING IMPROVEMENTS, IF ANY, ADJACENT TO THE AREA ARE NOT PART OF THIS SURVEY AND WERE NOT LOCATED AT THIS TIME.

COORDINATES ARE BASED ON THE STATE PLANE COORDINATE SYSTEM FOR THE FLORIDA EAST ZONE NAD 83/1990 ADJUSTMENT AND BASED ON GPS REAL-TIME TIES TO STATION DESIGNATION COOTER AND SOTO AS PROVIDED BY MIAMI-DADE WATER AND SEWER DEPARTMENT.

STATION DESIGNATION: COOTER
LOCALITY: GRATER MIAMI
COUNTY: MIAMI-DADE
STATE PLANE ZONE: FLORIDA EAST 901
VERTICAL DATUM: 7.634 (NGVD 29) 6.079 (NAVD 88)
GEOGRAPHIC COORDINATE (LATITUDE/LONGITUDE): N 25°53'56.108860" W 80°21'21.897860"
STATE PLANE COORDINATE (NORTHING/EASTING): 569471.952 / 867844.872

STATION DESIGNATION: SOTO
LOCALITY: GRATER MIAMI
COUNTY: MIAMI-DADE
STATE PLANE ZONE: FLORIDA EAST 901
VERTICAL DATUM: 10.292 (NGVD 29) 8.737 (NAVD 88)
GEOGRAPHIC COORDINATE (LATITUDE/LONGITUDE): N 25°52'06.324713" W 80°20'23.346531"
STATE PLANE COORDINATE (NORTHING/EASTING): 558414.457 / 873247.407

- ORIGINAL BENCHMARK USED AT THE SITE:
BENCHMARK: N-3061 (PK AND BRASS WASHER IN CONCRETE SIDEWALK)
NW 138 ST --- 200' NORTH OF C/L
NW 97 AVE --- 19' EAST OF C/L
ELEVATION: 6.98 (N.G.V.D. 29) (F.B. 657 - PG. 5)

ELEV.:14.00 (NGVD29) - DENOTES ELEVATION RELATIVE TO THE 1929 NGVD OF MEAN SEA LEVEL AND ARE BASED ON A BENCH MARK SUPPLIED BY THE ENGINEERING DEPARTMENT OF MIAMI DADE COUNTY, FLORIDA.
ELEV.:12.445 (NGVD88) - DENOTES ELEVATION DERIVED USING CORPSCON 6.0.1 FURNISHED BY THE U.S. ARMY CORPS OF ENGINEERS (VERTCON 94).

LEGEND:
Ø - DENOTES DIAMETER.
N - DENOTES NORTHING.
E - DENOTES EASTING.
R - DENOTES RADIUS.
BM - DENOTES BENCHMARK.
NAVD 88 - DENOTES NORTH AMERICAN VERTICAL DATUM.
NGVD 29 - DENOTES NATIONAL GEODETIC VERTICAL DATUM.
ELEV. - DENOTES ELEVATION.

CERTIFICATION:
I HEREBY CERTIFY THAT THIS SPECIFIC PURPOSE SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

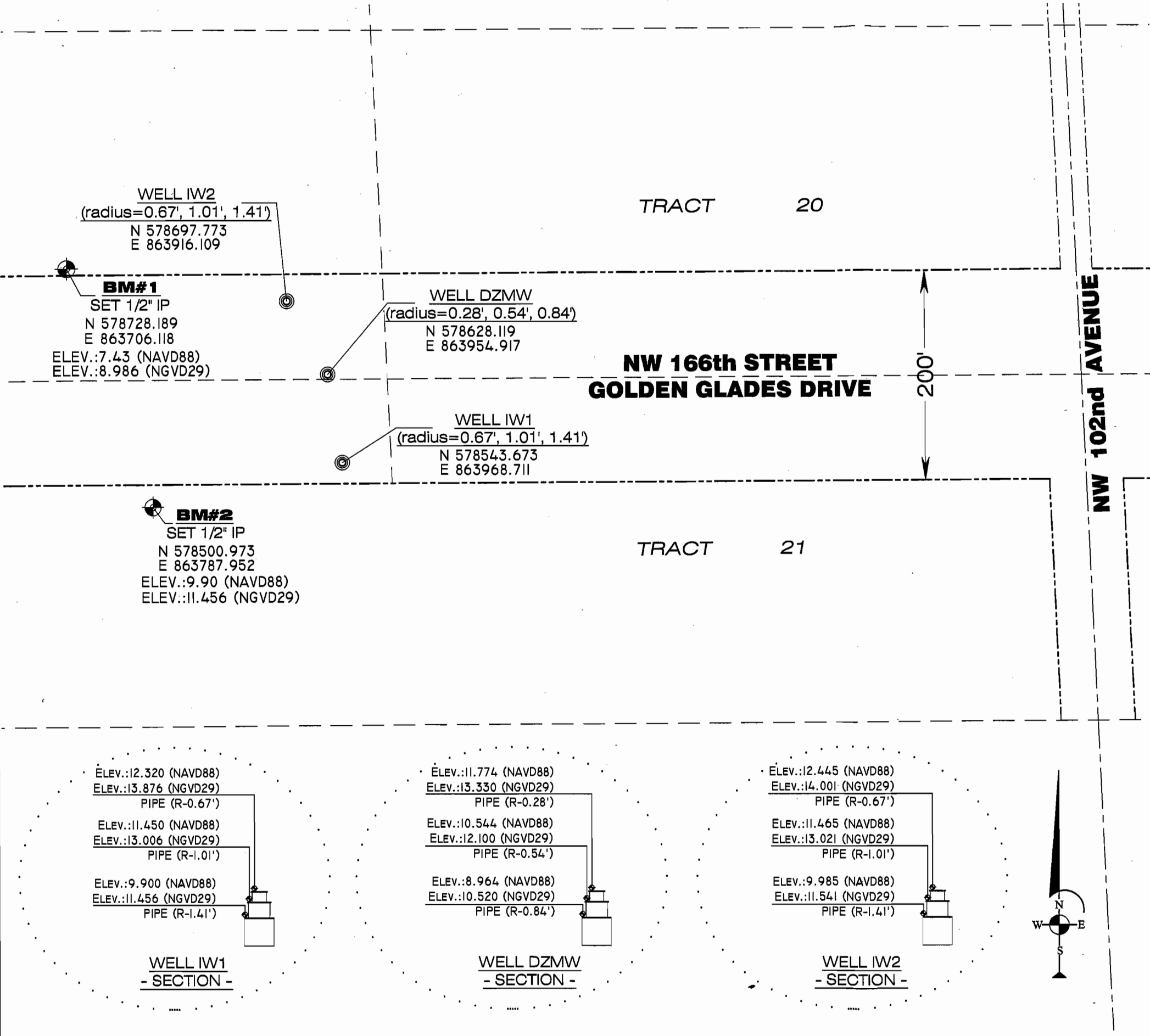
MANUEL G. VERA Jr.
PROFESSIONAL SURVEYOR AND MAPPER No 5291
STATE OF FLORIDA

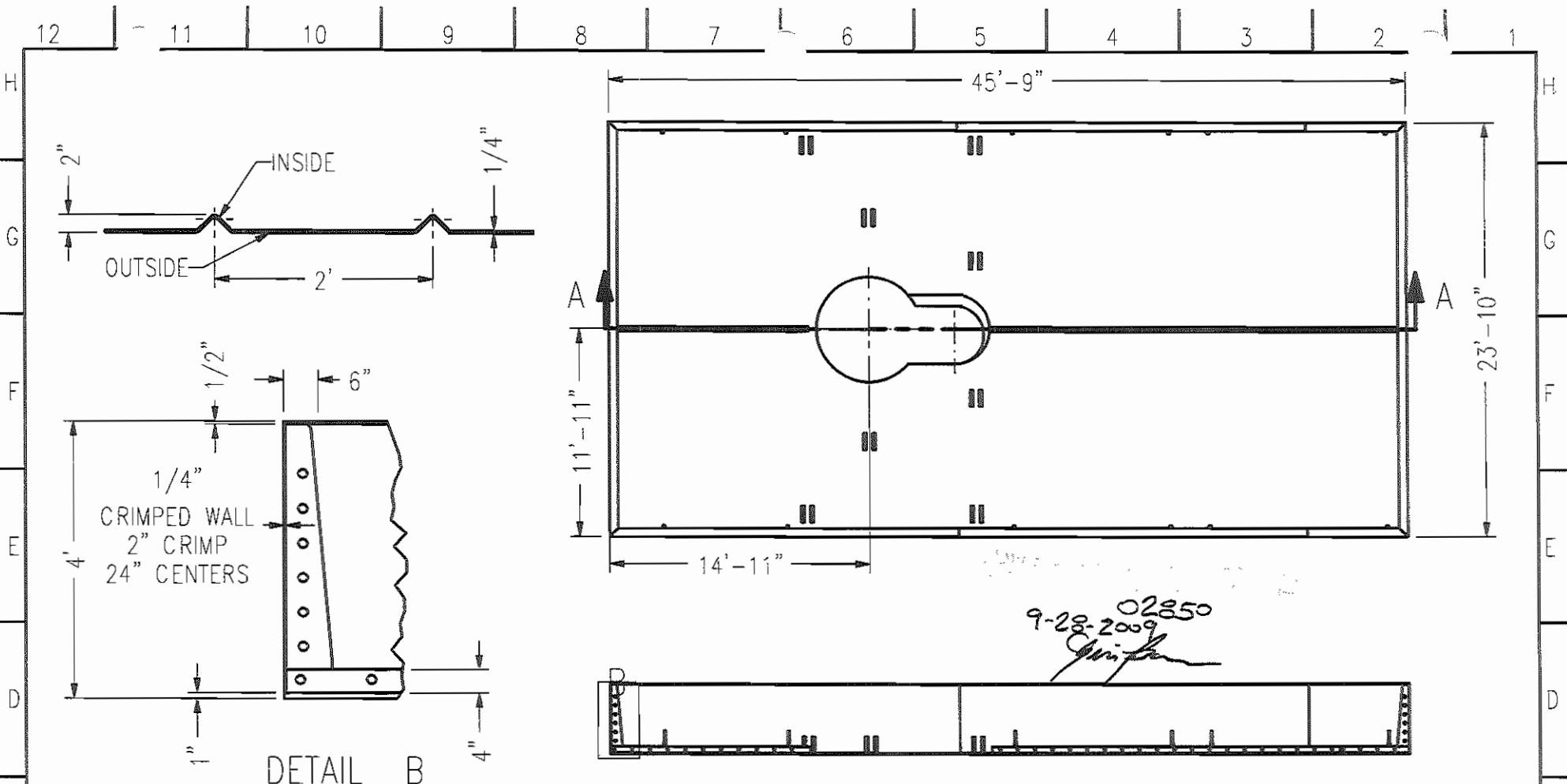
NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
DATE OF SURVEY: 07-19-10.

MANUEL G. VERA & ASSOCIATES, INC.
ENGINEERS • SURVEYORS • MAPPERS
13960 SW 47th Street • Miami, FL 33175 • Phone (305)221-6210
P.O. BOX 650578 • Miami, FL 33265 • Fax (305)221-1295
www.mgvera.com • e-mail: mvera@mgvera.com L.B. 2439

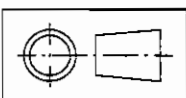
SPECIFIC PURPOSE SURVEY

REVISIONS:	PROPERTY OF:			
DATE 07-26-2010	DRAWN BY R.M.	SCALE AS SHOWN	F.B./PG. 657/78	JOB No.

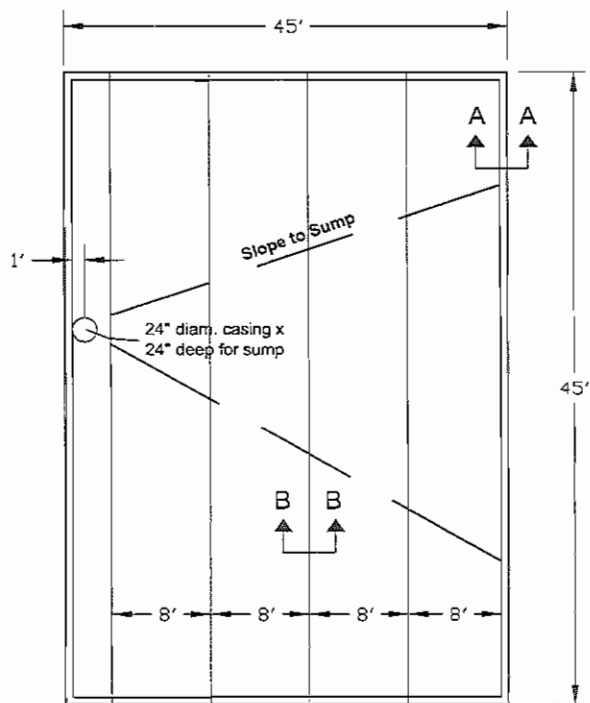




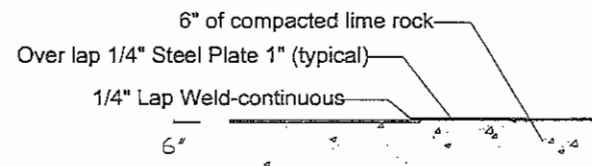
SECTION A-A

<div>TOLERANCES (UNLESS SPECIFIED)</div> <div>FRACTIONS: BELOW 1" 1/64" 1"-12" 1/32" ABOVE 12" 1/16"</div> <div>DECIMALS: .XX ±.01 .XXX ±.005 ANGLES ±1/4"</div> <div>SURFACE FINISH VALUES IN Ra MICRONS</div>	<div>Material</div> <div></div> <div>DRAWN TO ANSI STD5 DIMENSIONS IN INCHES DO NOT SCALE</div>	<div>YOUNGQUIST BROTHERS, INC. 15465 Pine Ridge Road, Fort Myers, Florida 33908</div> <div>This drawing is confidential. This drawing and its copyright are the property of or licensed to the above company and must not be used, disclosed or reproduced in any form whatsoever except as authorised in writing by the above company. This drawing must be returned with quotation and/or on completion of job as applicable.</div> <div>TEMPORARY STEEL CONTAINMENT PAD E-SERIES RIG</div> <div>CONTAINMENT PAD DETAIL</div>	<table><tr><td>Drawn JAM</td><td colspan="2">Date 12/17/2007</td></tr><tr><td>Checked</td><td colspan="2">Date</td></tr><tr><td>Approved</td><td colspan="2">Date</td></tr><tr><td>Sheet Size A</td><td>Scale</td><td>Project No</td></tr><tr><td colspan="3">Drawing Number Pit 5 Detail.idw</td></tr><tr><td colspan="2">Sh 1 of 1</td><td>Revision 0</td></tr></table>	Drawn JAM	Date 12/17/2007		Checked	Date		Approved	Date		Sheet Size A	Scale	Project No	Drawing Number Pit 5 Detail.idw			Sh 1 of 1		Revision 0
Drawn JAM	Date 12/17/2007																				
Checked	Date																				
Approved	Date																				
Sheet Size A	Scale	Project No																			
Drawing Number Pit 5 Detail.idw																					
Sh 1 of 1		Revision 0																			

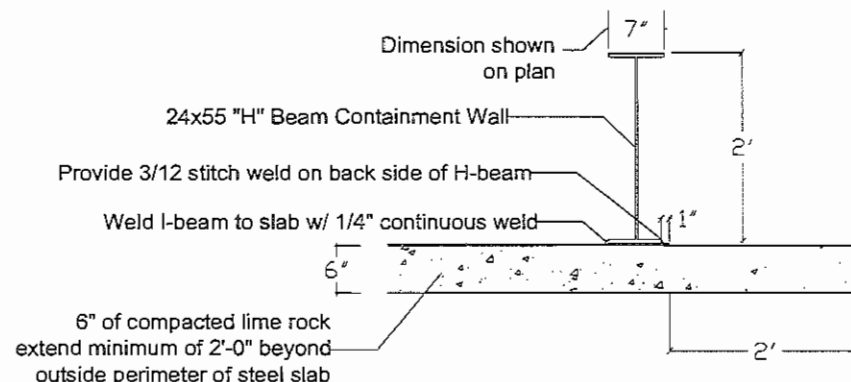
Q-28-2009
02850
[Signature]



Mud System Pad



Section B-B
Typical Lap Joint



Section A-A
Typical Wall Section

NTS

Prepared by:

Youngquist Brothers, Inc.
15465 Pine Ridge Rd.
Ft. Myers, FL 33908
239-489-4444

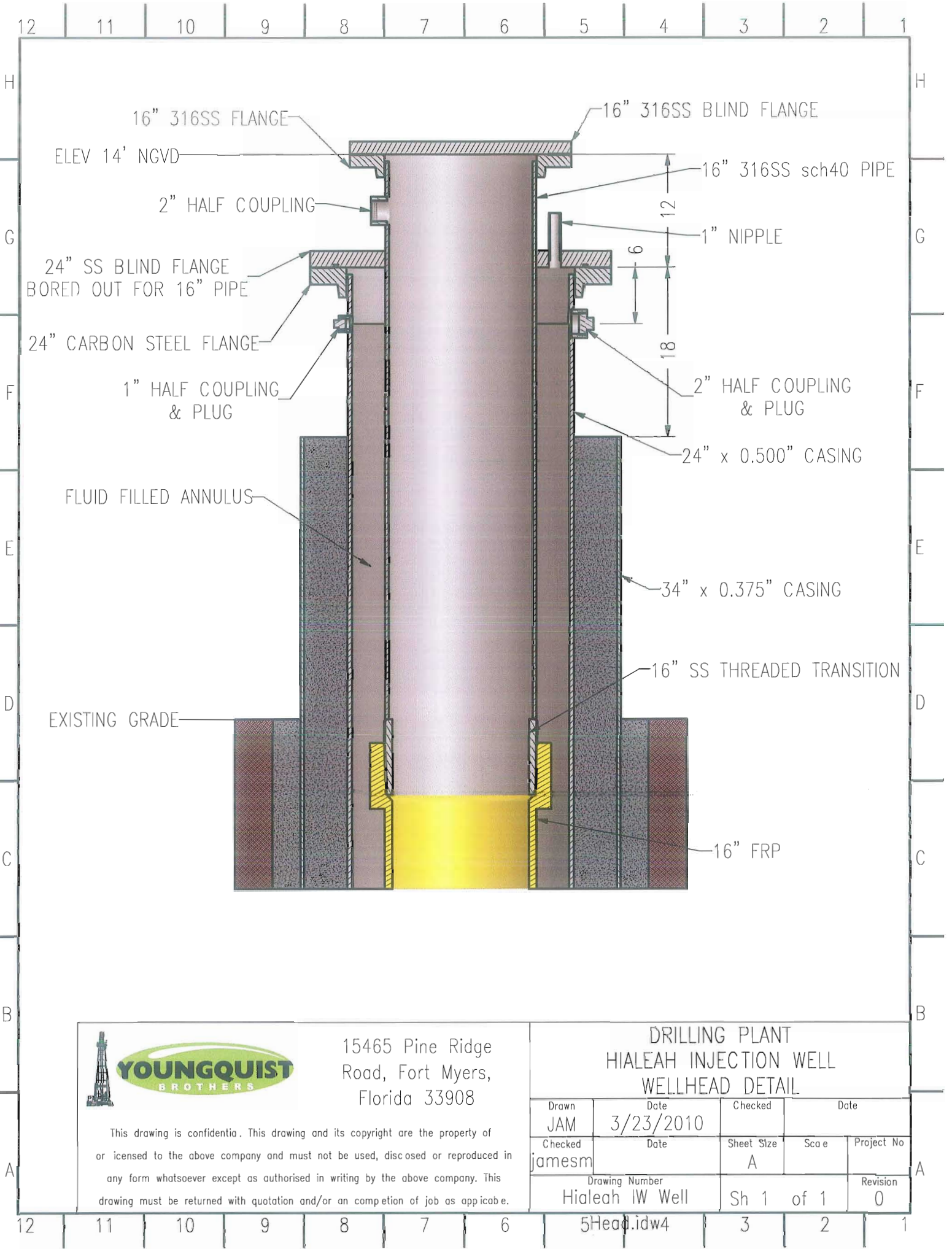
General Notes:

- 1) The drilling pad shall be constructed of continuous 1/4" thick ASTM A36 steel plate. All welding for the steel drilling pad and containment wall to be 1/4" continuous in accordance with the American Welding Society Structural Welding Code which shall be watertight.
- 2) Any required stabilization shall be in accordance with FDOT Standard Specification Section 160.
- 3) The steel drilling pad shall pitch to the sump constructed in such fashion as to be in accordance with FDOT Standard Specification Section 200.

TKW
CONSULTING ENGINEERS
5521 Banner Drive
Fort Myers, Florida 33912
239.278.1992 • FAX 239.278.0922
E-MAIL: info@tkwonline.com
Engineering Certification # 5762
Survey LB # 734

[Signature]
Sharon R. Anderson P.E.
Reg.# 53515
James T. Lange P.E.
Reg.# 62694
Date: Jan 23, 2008

Youngquist Brothers, Inc.		Sheet 1 of 1
15465 Pine Ridge Road	Temporary Containment Mud Pad	
Ft. Myers, FL. 33908	Date: January 23, 2008	



YOUNGQUIST
BROTHERS

15465 Pine Ridge
Road, Fort Myers,
Florida 33908

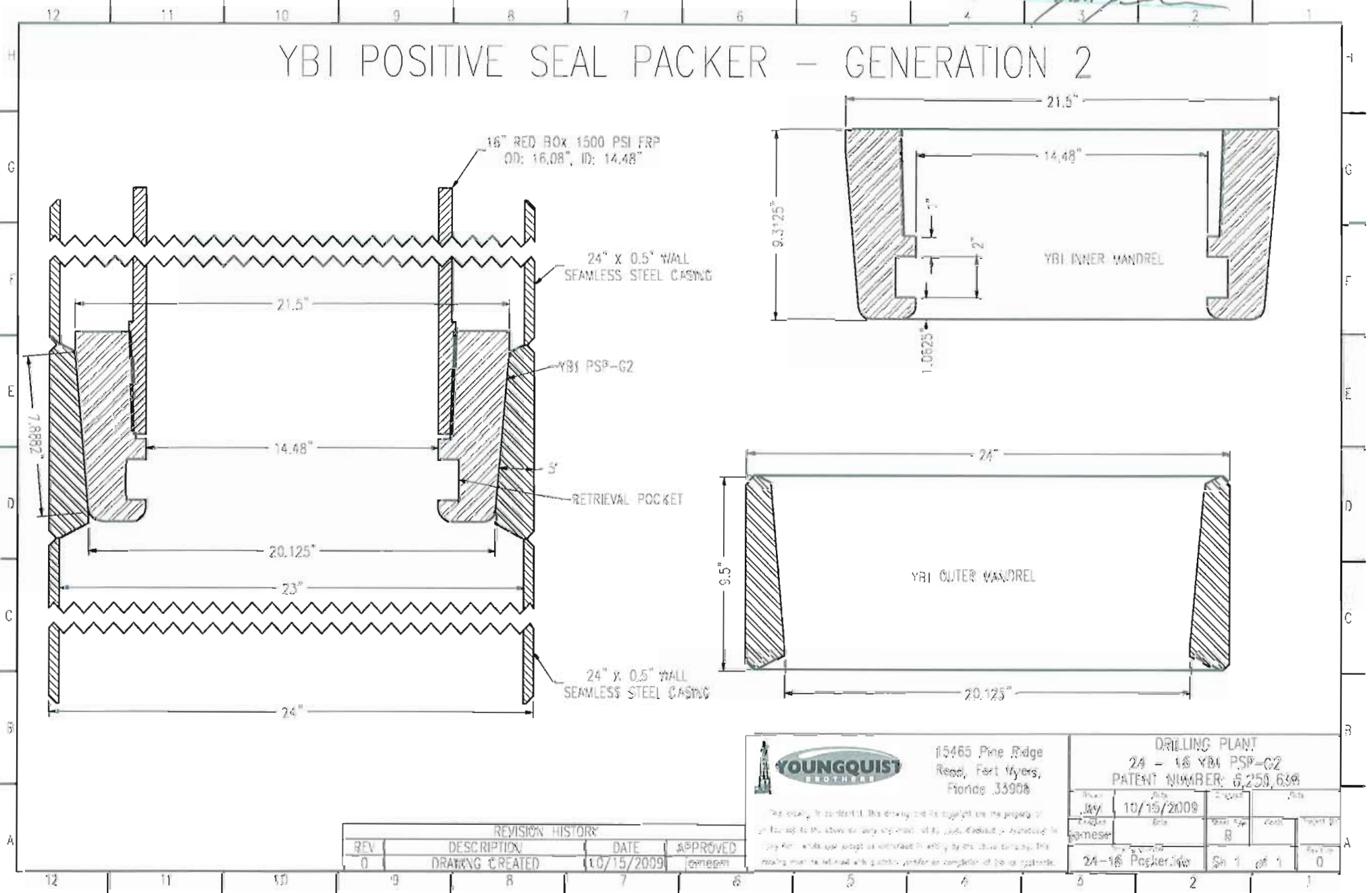
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DRILLING PLANT
HIALEAH INJECTION WELL
WELLHEAD DETAIL

Drawn JAM	Date 3/23/2010	Checked	Date		
Checked jamesm	Date	Sheet Size A	Scale	Project No	
Drawing Number Hialeah IW Well			Sh 1 of 1	Revision 0	

5Head.idw4

YBI POSITIVE SEAL PACKER – GENERATION 2



		15465 Pine Ridge Road, Fort Myers, Florida 33908		DRILLING PLANT	
				24 - 16 YBI PSP-G2	
				PATENT NUMBER: 6,250,630	
Drawn by	10/15/2009	Checked by	10/15/2009	Drawn by	10/15/2009
YBI/Section No	02852	Drawn by	R	Checked by	10/15/2009
24-16 Packer.dwg		Sh	1	of	1
		Rev	0		

REVISION HISTORY			
REV	DESCRIPTION	DATE	APPROVED
0	DRAWING CREATED	10/15/2009	Youngquist



FUTURE PIPE INDUSTRIES

Inspection Certificate

Job No: 110000134

October 22, 2008

Purchaser: Ozone

SO #: 62L000856

Destination: Sunrise, Florida

Product: 16" RB 1250

Quantity: 2550' Ft

We hereby certify that the materials & fittings supplied have been tested and comply with API 15 HR spec's.

Material Certificate

Material: 16" RB 1250

Test pressure: 1500 psi

Certificate Number: FPI-2008-31

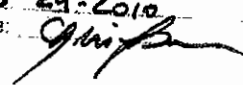
Customer: Ozone

Sales Order: 62L000856

Produced By: Future Pipe Industries, Inc. - Houston, TX

FPI Order Number: 110000134

Pipe System: Aromatic Amine heat cured epoxy

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No# 02852
Date: 3-24-2010
Signature: 

Raw Material Specifications:

Resin type- Epoxy
Curing Agent- Aromatic Amine
Glass Fiber- E-Type

Non Destructive Tests:

Dimensional Exam - ASTM D 3567
Visual Standards – API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with API 15 HR.

Certificate of conformity Statement:

All items delivered under this certificate number were manufactured in accordance with API 15 HR specifications:

We hereby certify that the materials described above have been tested and comply API 15 HR.

Raymond Jones
QC Supervisor
Future Pipe Industries
11811 Proctor Rd Houston TX, 77038



FUTURE PIPE INDUSTRIES

Inspection Certificate

Job No: 8762 Jt. 18

January 8, 2006

Purchaser: Ozone

SO #: 62L000856

Destination: Sunrise, Florida

Product: 16" RB 1250

Quantity: 30' Ft

We hereby certify that the materials & fittings supplied have been tested and comply with API 15 HR spec's.

Material Certificate

Material: 16" RB 1250

Test pressure: 1500 psi

Certificate Number: FPI-2008-31

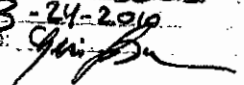
Customer: Ozone

Sales Order: 62L000856

Produced By: Future Pipe Industries, Inc. - Houston, TX

FPI Order Number: 8762

Pipe System: Aromatic Amine heat cured epoxy

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No# 02852
Date: 3-24-2010
Signature: 

Raw Material Specifications:

Resin type- Epoxy
Curing Agent- Aromatic Amine
Glass Fiber- E-Type

Non Destructive Tests:

Dimensional Exam - ASTM D 3567
Visual Standards - API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with API 15 HR.

Certificate of conformity Statement:

All items delivered under this certificate number were manufactured in accordance with API 15 HR specifications:

We hereby certify that the materials described above have been tested and comply API 15 HR.

Raymond Jones
QC Supervisor
Future Pipe Industries
11811 Proctor Rd Houston TX, 77038

Inspection / Quality Certificate

<u>Job No:</u>	110000090	<u>Date:</u>	3/24/ 2010
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Hialeah, Florida
<u>Certificate Number:</u>	FPI-2010-5	<u>Sales Order:</u>	621000463
<u>Product:</u>	16" RB 1250		

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000090	1250	1250

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

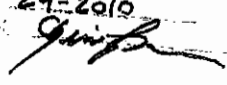
- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

MUNIQUEST BROTHERS, INC.
Has Received this Shop Drawing/Submital
VBI Section No. 02852
Date: 3-24-2010
Signature: 

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

Job No: 21000086 Date: 3/24/ 2010
Purchaser: Ozone Destination: Hialeah, Florida
Certificate Number: FPI-2010-6 Sales Order: 62L000562
Product: 16" RB 1250

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	21000086	1250	1250

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

ROUNDQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submitted
781/Section No. 02852
Date: 3-24-2010
Signature: *[Signature]*

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	110000168	<u>Date:</u>	3/16/ 2010
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Hialeah, Florida
<u>Certificate Number:</u>	FPI-2010-4	<u>Sales Order:</u>	62L001088
<u>Product:</u>	16" RB1250	<u>Quantity:</u>	80- Joints (2400 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000168	1250	1250

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:


- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
Per Section No. 02052
Date: 3-16-2010
Signature: 

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA



FUTURE PIPE INDUSTRIES

Inspection Certificate

Job No: 100000142

June 1, 2009

Purchaser: Ozone

SO #: 62F000778

Destination: Fort Myers, Florida

Product: 16" RB 1250 T&C

Quantity: 2773' Ft

We hereby certify that the materials & fittings supplied have been tested and comply with Future Pipe Industries Inc. standards.

Material Certificate

Material: 16" RB 1250 T&C

Test pressure: 1500 psi

Certificate Number: FPI-2009-34

Customer: Ozone

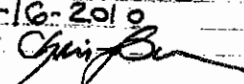
Sales Order: 62F000778

Produced By: Future Pipe Industries, Inc. - Houston, TX

FPI Order Number: 100000142

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 3-16-2010
Signature: 

Resin type- Epoxy
Curing Agent- Aromatic Amine
Glass Fiber- E-Type

Non Destructive Tests:

Dimensional Exam - ASTM D 3567
Visual Standards – API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries Inc. standards.

Certificate of conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries Inc standards.

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries Inc. standards.

Raymond Jones
QC Supervisor
Future Pipe Industries
11811 Proctor Rd Houston TX, 77038

温州宝丰特钢有限公司


WENZHOU BAOFENG SPECIAL STEEL CO., Ltd


产品质量保证书
CERTIFICATE OF PRODUCT QUALITY

合同号 Contract No:

用户 Customer:

产品名称: 不锈钢无缝管
Product: STAINLESS STEEL
质量保证书 Certificate No: 200704314
Date: 2007-04-20

热处理号 Heat No.	钢 种 Grade	规 格 Size	支数 Piece (pc)	长度 Feet (ft)	化学成份% CHEMICAL COMPOSITION%								交货状态 Deliver condition	产品标准 Standards
					C	Mn	Si	P	S	Ni	Cr	Mo		
H1-455A	316L	16"sch40			0.017	1.01	0.48	0.034	0.005	10.10	16.40	2.03	Annealing Pickling 20ft/pc	ASTM A312
力学性能 Mechanical property				工艺性能 Process property										
屈服点 Yield point Os (Mpa)	抗拉强度 Tensile Strength Os (Mpa)	伸长率 Ductile rate Os %	断面收缩率 Section reduction ratio P%		冲击力 Impact power AK(J)		扩 口 Drift expanding		压 扁 Flattening		水压 Water pressure	晶间腐蚀 Inter- grain corrosion		
210-240	525-550	42-48					GOOD		GOOD		GOOD			
无损检验 Non-destructive test					判定员 Judge: 王									
超声波 Ultrasound test		涡流 Eddy current test												

YOUNGLOUIS BROTHERS INC
Has Received T.V. Photo Drawing/Submitter
YB/Section No: 02852
Date: 3-5-2010
Signature: 

沧州乾成钢管有限公司

产品质量证明书

河北省沧州市盐山县

ORIGINAL

CANGZHOU QIANCHENG STEEL PIPE CO.,LTD

MILL CERTIFICATE

TEL: 86-317-6322101 FAX: 86-317-6320919

DATE: 2008 03 30

订货单位 CUSTOMER	OZONE INDUSTRIES CORPORATION/YOUNGQUIST BROTHERS	产品名称 PRODUCT	无缝钢管 CARBON STEEL PIPE	交货状态 DELIVERY CONDITION	正火 NORMALIZE
收货单位 PURCHASER	OZONE INDUSTRIES CORPORATION/YOUNGQUIST BROTHERS	合同号码 CONTRACT NO.	OZ110707003	质保书号 CERTIFICATION	1306CQ804035
标准 SPECIFICATION	API 5L-2000	钢级 STEEL GRADE	GR.B PSL1	总支数(支) TOTAL PIECES	273

序号 NO.	炉号 HEAT NO.	批号 LOT NO.	规格 SIZE		数量 QUANTITY		化学成分% CHEMICAL COMPOSITION(+100)								机械性能 PHYSICAL PROPERTIES			
			直 径 IN	壁 厚 IN	支 数	长 度 M	重 量 MT	C	Mn	S	P	Si	Cr	V	Al	抗拉强 度 T.S. Mpa	伸 长 率 E.L. %	屈 服 强 度 Y.S. Mpa
1	174265	80	24"	0.5"	268	4875.97	293.468	22	54	1.2	0.01	0.2	2.4	2.5		450	30	335
2	074289	70	24"	0.5"	273	4875.97	114.27	22	51	1.2	0.01	0.2	2.2	2.5		445	30	340
Total					273	8851.94	377.678											

超声波探伤 U.T	涡流探伤 E.T	硬度 HARDNESS	热处理工艺 H.T	沧州乾成钢管有限公司 CANGZHOU QIANCHENG STEEL PIPE CO.,LTD 金相组织 MICROSTRUCTURE	晶粒度 GRAIN SIZE	压扁 P FLATTENING	水压试验 HYDRO TEST	冷弯 BENDING	冲击试验 IMPACT TEST AK
合格 GOOD	/	/	/	合格 GOOD	/	合格 GOOD	合格 GOOD	合格 GOOD	合格 GOOD
注释 NOTE 兹证明本表所列产品, 均依标准规定制造。取样, 试验和检验, 并符合标准及合同要求 We here certify that material, herein described has been manufactured, sampled, tested and inspected in accordance with the requirements of above specifications and purchase order, and the requirements								检验员: INSPECTOR: 张德芳 许可证号: LICENCE: API5L-0666	

YOUNGQUIST BROTHERS, INC.

Has Received This Shop Drawing/Submittal

YBI/Section No# 02853

Date: 3-3-2012

Signature: [Signature]

无锡德新钢管有限公司

WUXI DEXIN STEEL TUBE CO., LTD.

产品质量证明书

INSPECTION CERTIFICATE
(EN10204 3.1)

Page 1 / 1

无锡市惠山经济开发区金匮路553号

Tel:(0510)83599888 Fax:(0510)83599890

订货单号 CUSTOMER		证书号 CERTIFICATE NO.						P0810310005		制法方法 MAKING METHOD		热处理 NOT FINISHED																							
收货单位 PURCHASER		合同号 CONTRACT NO.						---		交货状态 DELIVERY CONDITION		热轧 HOT FINISHED																							
产品名称 PRODUCT		无缝钢管 SEAMLESS STEEL PIPES						信用证号 L/C NO.		热处理温度 HEAT TREATMENT		---																							
标准 SPECIFICATION		ASTM A53/A106/API 5L						钢级 GRADE		Gr.B		签发日期 DATE OF ISSUE		2008-10-31																					
外径 O.D.		24" 609.6mm		壁厚 W.T.		0.500 12.7 mm		长度 LENGTH		---		支数(支) PIECES (PCS)		94PCS		米数(米) TOTAL METERS (M)		733.32M		总重量(MT) TOTAL WEIGHT(TONS)		137.08MT													
化 学 成 份 % CHEMICAL COMPOSITION																						非金属夹杂物 (级) Non-Inclusions (Grade)													
序号 NO.	批号 LOT NO.	熔炼号 HEAT NO.	支数 PCS	a1	C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	N	Ti	Al	B	A	B	C	D													
				Max Min	0.28		1.20	0.030	0.030													≤2.5	≤2.5	≤2.5	≤2.5										
1	Q80E100	E100B0551	37	II	0.17	0.23	0.46	0.007	0.004	0.03	0.03	0.05	0.01	0.010					0.5	0.5	0.5	0.0													
2	Q80E100	E100B4051	37	IV	0.20	0.22	0.46	0.008	0.008	0.05	0.02	0.04	0.04	0.006					0.5	0.5	0.5	0.0													
3	Q80E100	E100B4052	20	II	0.19	0.22	0.46	0.011	0.009	0.06	0.02	0.03	0.01	0.005					0.5	0.5	0.5	0.0													
拉伸试验 TENSILE TEST																						冲击试验 IMPACT TEST				硬度试验 HARDNESS TEST (HRC)		水压试验 HYDROSTATIC TEST		无损探伤检测 N.D.E.		金相试验 METALLOGRAPHIC EXAMINATION			
标距 GAGE LENGTH (G0.8mm)																						Ave (J)								涡流探伤 E.T.		超声波探伤 U.T.		显微组织 MICROSCOPIC STRUCTURE	
网上 序号 NO.	*2	抗拉强度 T.S. MPa	屈服强度 Y.S. MPa	伸长率 E.L. %	试验温度 TEMPERATURE OF TEST																														
	*3	Max Min	414	241	26.0	1	2	3	AVG.																										
1	L	535/510	325/330	32.5/31.5	--	--	--	--					880PSI GS		合格 GOOD	合格 GOOD	铁素体+珠光体 F+P				6.0														
2	L	525/510	336/310	30.5/32.0	--	--	--	--					880PSI GS		合格 GOOD	合格 GOOD	铁素体+珠光体 F+P				6.5														
3	L	520/550	320/340	34.0/33.0	--	--	--	--					880PSI GS		合格 GOOD	合格 GOOD	铁素体+珠光体 F+P				6.0														
外观和尺寸 VISUAL & DIMENSION		合格 GOOD		原扁试验 FLATTENING TEST		合格 GOOD		弯曲试验 BENDING TEST		---		扩口试验 EXPAND TEST		---		---		---		---		---													
注释 NOTES		*1. H. HEAT (LABLE) ANALYSIS; P. PRODUCT ANALYSIS. *2. 试样尺寸 SIZE: 颈形试样 STRIP T×19.05 mm. *3. 试验方向 ORIENTATION: L=纵向 LONG. *4. SY=0.2. WE HEREBY CONFIRM THAT OUR PRODUCTS ARE MADE WITH MATERIALS WHICH ARE FREE FROM RADIATION CONTAMINATION																																	
会签者 SURVEYOR		兹证明本表所列产品，均依标准规定制造、取样、试验和检验，并符合标准及合同要求。 WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION(S), AND THAT THEY SATISFY THE REQUIREMENTS.										检验员 INSPECTOR		市校大 CHIEF		李冲珍		TJ 检验印章 STAMP OF MILL INSPECTOR																	

YOUNGQUIST BROTHERS, INC.

Has Received This Shop Drawing/Submittal

YBI/Section No# 02852

Date: 3-3-2019

Signature: _____



无锡德新钢管有限公司

Wuxi Dexin STEEL TUBE Co., Ltd

产品质量证明书

INSPECTION CERTIFICATE

(EN10204 3.1)

Page 1 / 1

无锡市惠山区经济开发区金惠路588号

Tel:(0510)83599888 Fax:(0510)83599890

订货单位 CUSTOMER					证书号 CERTIFICATE NO.	P0811120003		制造方法 MAKING METHOD	热轧 HOT FINISHED		
收货单位 PURCHASER					合同号 CONTRACT NO.	—		交货状态 DELIVERY CONDITION	热轧 HOT FINISHED		
产品名称 PRODUCT	无缝钢管 SEAMLESS STEEL PIPES				信用证号 L/C NO.	—		热处理温度 HEAT TREATMENT	—		
标准 SPECIFICATION	ASTM A53/A106/API 5L				钢级 GRADE	Gr. B		签发日期 DATE OF ISSUE	2008-11-12		
外径 O.D.	24" 609.6mm	壁厚 W.T.	0.509 12.7mm	长度 LENGTH	—	总支数(支) PIECES (PCS)	56PCS	总长(米) TOTAL METERS (M)	418.27M	总重量(吨) TOTAL WEIGHT (TONS)	78.199T

序号 NO.	批号 LOT NO.	熔炼号 HEAT NO.	化 学 成 份 % CHEMICAL COMPOSITION																非金屑夹杂物 (级) Non-Inclusions (Grade)			
			支数 PCS	≈1	碳 C	硅 Si	锰 Mn	磷 P	硫 S	铜 Cu	镍 Ni	铬 Cr	钼 Mo	钒 V	氮 N	铌 Nb	铝 Al	钛 Ti	A	B	C	D
				Max Min	0.28		1.20	0.030	0.030											≤2.5	≤2.5	≤2.5
1	0806100	E10084052	18	H	0.19	0.22	0.46	0.011	0.009	0.06	0.02	0.03	0.01	0.005				0.5	0.5	0.5	0.0	
2	0806100	E10080569	36	H	0.19	0.24	0.46	0.011	0.004	0.07	0.03	0.05	0.010	0.010				0.5	0.5	0.5	0.0	

向上 序号 NO.	拉伸试验 TENSILE TEST 标距 GAUGE LENGTH (50-8mm)				冲击试验 IMPACT TEST J _{AK} (J)				硬度试验 HARDNESS TEST (HB)	水压试验 HYDROSTATIC TEST	无损探伤检验 N.D.E.		金相试验 METALLOGRAPHIC EXAMINATION	
	*2 *3	抗拉强度 T.S. MPa	屈服强度 Y.S. MPa	伸长率 E.L. %	试验温度 TEMPERATURE OF TEST						表面探伤 E.T.	超声波探伤 U.T.	显微组织 MICROSCOPIC STRUCTURE	晶粒度 (级) GRAIN SIZE
	Max Min	414	241	26.0	1	2	3	AVG.						
1	1.	520/550	320/340	34.0/33.0	—	—	—	—	—	880PSI 6S	合格 GOOD	合格 GOOD	铁素体+珠光体 F+P	8.0
2	1.	540/540	335/310	32.5/33.0	—	—	—	—	—	880PSI 6S	合格 GOOD	合格 GOOD	铁素体+珠光体 F+P	6.5
外观和尺寸 VISUAL & DIMENSION		合格 GOOD	压缩试验 FLATTENING TEST		合格 GOOD	弯曲试验 BENDING TEST			—	扩口试验 EXPAND TEST	—		卷边试验 FLARING TEST	

注释 NOTES	*1. H. HEAT (LADLE) ANALYSIS; P. PRODUCT ANALYSIS. *2. 试样尺寸 SIZE: 圆形试样 STRIP T=19.05 mm. *3. 试验方向 ORIENTATION, L=纵向 LONG. *4. SY=0.2. WE HEREBY CONFIRM THAT OUR PRODUCTS ARE MADE WITH MATERIALS WHICH ARE FREE FROM RADIATION CONTAMINATION										六日质量专用章			
检验者 SURVEYOR	我们证明本表所列产品, 均依照标准规定制造、取样、试验和检验, 并符合标准及合同要求。 WE HEREBY CERTIFY THAT THE MATERIALS DESCRIBED HEREIN HAVE BEEN MANUFACTURED, SAMPLED, TESTED AND INSPECTED IN ACCORDANCE WITH THE CUSTOMER'S SPECIFICATION (S). AND THAT THEY SATISFY THE REQUIREMENTS.										检验员 INSPECTOR	李计珍	审核人 CHIEF	李计珍
工厂检验印章 STAMP OF MTL. INSPECTOR														

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YB/Section No# 01252
Date: 3-3-2010
Signature: *Guifan*



CERTIFICATO DI COLLAUDO
INSPECTION CERTIFICATE
(UNI EN 10204 3.1 / ISO 10474 3.1.B)

SLN
08/26035
Data/Date
31/10/2008

Pagina/Page
001/003

Cliente/Customer VASS PIPE AND STEEL CO., INC.	Rifer. Ordine Cll/Customer's order 22705RJ	Posiz. Cliente/Customer's Refer. 1212138/007	Conferma / Posiz./Cll order 1212138/007
Indirizzo/Address 158 THIRD ST PO BOX 58	Località/Town 11501 MINEOLA	Ordine di Vendita/Job Number E/460754/7	Avviso di spedizione/Shipping Note 00033156 - 31/10/2008
Prodotto/Product TUBI S.S. LINE PIPE NORMA API 5L PSL1 44 ED. ASTM A53 E NACE MR 01.75 (TOLLERANZE APISI) ACCIAIO GR. X42 PSL1, GR. B ASTM A53 GREZZI ESTERNAMENTE, OLEATI ESTERNAMENTE CON QUAKERCOAT 854 CLEAR SMUSSATI SECONDO API 5L 44 ED / ISO 3183-07 CT4:8825			
SEAMLESS LINE PIPES ACC. TO API 5L PSL1 44 ED. ASTM A53 E NACE MR 01.75 (TOLLERANZE APISI) STEEL GR. X42 PSL1, GR. B ASTM A53 INTERNALLY BARE, EXTERNALLY VARISHED WITH QUAKERCOAT 854 CLEAR BEVEL API 5L 44 ED / ISO 3183-07 CT4:8825			
Dimensioni/Dimensions Lgh. Da/Lg. From Lgh. A/Lg. To D.E. mm/O.D. mm SP mm/V.V.T. mm		Quantità/Quantity Pezzi/Pieces	Metri/Mtr
11582 12192 610,000 12,700		36	430,01
		Cil/Kg	Feet/Feet
		81675	1410,79
			Libbre/Lb
			180062,3

PROVA DI TRAZIONE/TENSILE TEST													
Prova/Test	Colata/Heat	T	L/T	Provetta (mm)/Test spec (mm)	Rs	MPA		Rm	Allungam. (%) /Elongation (%)				
				Tipi/ Dimensions/ Type Dimensions	Sez./Sec. mm²	%	Min. Max.	Min. Max.	Cal. min.	Min.	Min.	Oil/Oil	
N1187	987466	+ 20	L Rec	37.90 12.60	477.5	335.0		501.0	2"	50.8	29.0		49.6
N1189	987467	+ 20	L Rec	37.90 13.00	492.7	342.0		508.0	2"	50.8	30.0		47.6
T - 1: DOPPIA P.H.N.T. - AFTER P.H.N.T. L/T - L: LONGITUDINALE / LONGITUDINAL T: TRASVERSALE / TRANSVERSAL Tipo - Pec: RETTANGOLARE / RECTANGULAR Cll: TUBOLARE / TUBULAR SD = 5.65" E													
2: DOPPIA STRAIN AGING - AFTER STRAIN AGING T: TRASVERSALE / TRANSVERSAL Tipo - Pec: STRISCIA / STRIP Cll: TUBOLARE / TUBULAR													
3: DOPPIA P.H.N.T. - AFTER P.H.N.T. - AFTER STRAIN AGING Rm - TENSILE STRENGTH Rm - TENSILE STRENGTH													

PROVA DI DUREZZA/HARDNESS TEST					
Prova/Test	Colata/Heat	T	1" Da/From	2" A/To	3"
N1187	987466		0.0	0.0	78.6
N1189	987467		0.0	0.0	81.4
T - 1: DOPPIA P.H.N.T. - AFTER P.H.N.T. L/T - L: LONGITUDINALE / LONGITUDINAL T: TRASVERSALE / TRANSVERSAL Tipo - Pec: RETTANGOLARE / RECTANGULAR Cll: TUBOLARE / TUBULAR					
2: DOPPIA STRAIN AGING - AFTER STRAIN AGING T: TRASVERSALE / TRANSVERSAL Tipo - Pec: STRISCIA / STRIP Cll: TUBOLARE / TUBULAR					
3: DOPPIA P.H.N.T. - AFTER P.H.N.T. - AFTER STRAIN AGING Rm - TENSILE STRENGTH Rm - TENSILE STRENGTH					

PROVE TECNOL. / TECHNOL. TESTS					
Prova/Test	Colata/Heat	T	E	Q	Num.
N1187	987466		1	2	3
N1189	987467		1	2	3
T - 1: DOPPIA P.H.N.T. - AFTER P.H.N.T. L/T - L: LONGITUDINALE / LONGITUDINAL T: TRASVERSALE / TRANSVERSAL Tipo - Pec: RETTANGOLARE / RECTANGULAR Cll: TUBOLARE / TUBULAR					
2: DOPPIA STRAIN AGING - AFTER STRAIN AGING T: TRASVERSALE / TRANSVERSAL Tipo - Pec: STRISCIA / STRIP Cll: TUBOLARE / TUBULAR					
3: DOPPIA P.H.N.T. - AFTER P.H.N.T. - AFTER STRAIN AGING Rm - TENSILE STRENGTH Rm - TENSILE STRENGTH					

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YB/Section No# **02852**
Date: **3-3-2010**
Signature: *[Signature]*

Il presente certificato non sostituisce il certificato cartaceo d'origine che sarà il solo a fare fede ad ogni effetto di legge e potrebbe non apparire in forma del rappresentante del cliente.
Questo certificato è emesso da un sistema computerizzato ed è valido senza firma, il certificato originale riporta il marchio "Tenaris" e colore verde. Il possessore del documento, qualora fosse copia, deve attestare a sua nome la conformità, assumendone ogni responsabilità per cui il cliente o semplicemente non consentendo l'uso. Qualora l'utente o l'utente non fosse conforme a termini di legge.

This certificate doesn't replace the definitive paper certificate which will be the only one valid to law purpose and it could not include the inspector's signature.
This certificate is issued by a computerized system and it is valid without signature. On the original certificate the trade-mark green coloured "Tenaris" is stamped. In case the owner of the original certificate would release a copy of it, he must attest its conformity to the original one taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.



CERTIFICATO DI COLLAUDO
INSPECTION CERTIFICATE
(UNI EN 10204 3.1 / ISO 10474 3.1.B)

N. di
08/26035
Pagina/Page
002/003
Data/Date
31/10/2008

Cliente/Customer VASS PIPE AND STEEL CO., INC.	Rifer. Ordine Cl./Customer's order 22705RJ	Posiz. Cliente/Customer's Ref.	Conferma / Posiz. Alia order 1212138/007
Indirizzo/Address 158 THIRD ST PO BOX 58	Località/Town 11501 MINEOLA	Stato/Country USA	Ordine di Vendita/Job Number E/480754/7
Avviso di spedizione/Shipping Note 00033156 - 31/10/2008			
Prodotto/Product TUBI S.S. LINE PIPE NORMA API 5L PSL1 44 ED. ASTM/ASME 106, ASTM/ASME 53 E NACE MR 01-75 (TOLLERANZE APISL) ACCIAIO GR. X42 PSL1, GR.B PSL1, GR.B ASTM ASME A5A 106, A5A 53 GREZZI RITERNAMENTE, OLEATI ESTERNAMENTE CON QUAKERCOAT 854 CLEAR SMESSATI SECONDO API 5L 44 ED /ISO 3183-07 CT4:8825			
SEAMLESS LINE PIPES ACC. TO API 5L PSL1 44 ED. ASTM/ASME 106, ASTM/ASME 53 E NACE MR 01-75 (TOLLERANCES APISL) STEEL GR. X42 PSL1, GR.B PSL1, GR.B ASTM ASME A5A 106, A5A 53 EXTERNALLY BARE, EXTERNALLY VARNISHED WITH QUAKERCOAT 854 CLEAR BEVEL API 5L 44 ED /ISO 3183-07 CT4:8825			
Dimensioni/Dimensions Lgh. Da/Lg. From Lgh. A/Lg. To D.E. mm/O.D. mm SP mm/W.T. mm 11582 12192 610,000 12,700		Quantità/Quantity Pezzi/Pieces Metri/Mt Chilo/Kg Feet/Fet Libbre/Lb 36 430,01 81675 1410,79 180062,3	

COMPOSIZIONE CHIMICA/CHEMICAL COMPOSITION

			C	Si	Mn	P	S	Ni	Cr	Mo	Cu	Al	Nb	V	F1	F2	F3	
			x100			x1000		x100				x1000						
Colata	H	Max	28		135	25	25	40	40	15	40				80	01,000	0,1500	0,0020
Heat	H	Min		10	29											0	0	0
Prova	P	Max	28		135	25	25	40	40	15	40				80	01,000	0,1500	0,0020
Testi	P	Min		10	29											0	0	0
987466	H		19	24	92	10	3	8	10	3	12	3	2	10	0,34	0,015	0,012	
N1187	P		18	22	90	11	3	8	10	3	12	3	2	10	0,34	0,015	0,012	
N1188	P		18	23	90	10	3	8	10	3	12	3	2	10	0,34	0,015	0,012	
987467	H		19	24	95	11	3	7	10	4	11	3	2	10	0,33	0,015	0,012	
N1189	P		18	24	94	10	3	7	10	4	11	3	2	10	0,33	0,015	0,012	
N1190	P		17	23	92	10	2	7	10	4	11	2	2	10	0,33	0,014	0,012	

F1 = C + Mn + Cr + Ni + Cu
F2 = C + Ni + V + Ti
F3 = C + Ni + V

PROVA DI TENUTA/LEAK TEST

Tipi/Type	U.M.	Sec.	Valore/Value
IDRAULICA/HYDRAULIC	BAR	5	109,0

NOTE/REMARKS

DOPO LE OPERAZIONI DI CONTROLLO, IL MATERIALE NON PRESENTA UN MAGNETISMO RESIDUO SUPERIORE A 20 GAUSS
DUREZZA HRC 22 MAX, IN ACCORDO ALLA SPEC. NACE MR-01-75/ISO 15156
AFTER INSPECTION OPERATION, THE MATERIAL HAS NOT A RESIDUAL MAGNETISM GREATER THAN 20 GAUSS
HARDNESS HRC 22 MAX, ACCORDING TO NACE MR-01-75/ISO 15156

EDIZIONE NORME/STANDARD EDITION

Norma/Standard	Anno/Year	Revisione/Revision	Anno/Year
API 5L	2008	44^	Ed.
ASTM A53/A106	2007		
ASME SA53/SA106	2007		
NACE MR0175/ISO 15156	2003		

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No# **02852**
Date: **3-3-2010**
Signature: *[Signature]*

Il presente certificato non sostituisce il certificato canonico di collaudo che sarà il solo a fare fede ad ogni effetto di legge e potrebbe non riportare la firma del rappresentante del cliente.
Questo certificato è emesso da un sistema computerizzato ed è valido senza firma. Il certificato originale riporta il marchio "Ternaris" in colore verde. Il possessore dell'originale, qualora ritenga copia, deve attestare a suo rischio e pericolo, assumendone ogni responsabilità per qualsiasi uso non autorizzato dalla Ternaris. L'uso non autorizzato è considerato una violazione della legge.

This certificate doesn't replace the definitive paper certificate which will be the only one valid to law purpose and it could not include the inspector/customer signature.
This certificate is issued by a computerized system and it is valid without signature. On the original certificate the trace-mark, green coloured "Ternaris" is stamped. In case the owner of the original certificate would release a copy of it, he must attest to the original one taking upon himself the responsibility for any unlawful or not allowed use. Any alteration and/or falsification will be subjected to the law.



CERTIFICATO DI COLLAUDO
INSPECTION CERTIFICATE
(UNI EN 10204 3.1 / ISO 10474 3.1.B)

N.Ord. 08/26035 Pagina/Page 003/003
Data/Date 31/10/2008

Cliente/Customer VASS PIPE AND STEEL CO., INC.		Rifer. Ordine Cli./Customer's order 22705RJ	Posiz. Cliente/Customer's Refr. 1212138/007
Indirizzo/Address 158 THIRD ST PO BOX 58	Località/Town 11501 MINEOLA	Stato/Country USA	Ordine di Vendita/Job Number E/480754/7
Prodotto/Product TUBI S.S. LINE PIPE NORMA API 5L PSL1 44 ED., ASTM A516 106, ASTM A516 53 E NACE MR 01.75 (TOLLERANZE API 5L) ACCIAIO GR. X42 PSL1, GR.B PSL1, GR.B ASTM A516 A516 106/A516 53 GREZZI ESTERNAMENTE, OLEATI ESTERNAMENTE CON QUAKERCOAT 854 CLEAR STRUSSA SECONDO API 5L 44 ED / ISO 3483-07 CT4:8825		Avviso di spedizione/Shipping Note 00033156 - 31/10/2008	
SEAMLESS LINE PIPES ACC. TO API 5L PSL1 44 ED., ASTM A516 106, ASTM A516 53 E NACE MR 01.75 (TOLLERANZE API 5L) STEEL GR. X42 PSL1, GR.B PSL1, GR.B ASTM A516 A516 106/A516 53 EXTERNALLY BARE, EXTERNALLY VARNISHED WITH QUAKERCOAT 854 CLEAR BEVEL API 5L 44 ED / ISO 3483-07 CT4:8825			
Dimensioni/Dimensions Lgh. Dav/Lg. From Lgh. A/Lg. To D.E. mm/O.D. mm SP mm/W.T. mm		Quantità/Quantity Pezzi/Pieces	Mesura Mm/In
11582 12192 610,000 12,700		36	430,01
		Chil/Kg	81675
		Pesi/feet	1410,79
		Libbre/Lb	180062,3


TUBI SENZA SALDATURA FINITI A CALDO
SEAMLESS HOT FINISHED PIPES

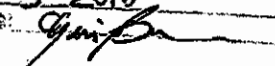
IL CONTROLLO VISIVO E DIMENSIONALE HA DATO ESITO SODDISFACENTE
VISUAL AND DIMENSIONAL CONTROL HAS BEEN CARRIED OUT WITH SATISFACTORY RESULT

L'ACCIAIO E' DI TIPO CALMATO, A GRANO FINE, PRODOTTO AL FORNO ELETTRICO
STEEL IS FULLY KILLED AND PRODUCED BY ELECTRIC FURNACE TO A FINE GRAIN PRACTICE

IL MATERIALE FORNITO E' CONFORME AI REQUISITI DELL'ORDINE
THE PRODUCT SUPPLIED IS IN COMPLIANCE WITH THE REQUIREMENTS OF THE ORDER.

FABBRICATO DA TENARIS DALLMINE
MANUFACTURED BY TENARIS DALLMINE

 Quality System Certified n.110950/001	FIRME/SIGNATURE		
		UFFICIO CERTIFICAZIONE QUALITA' QUALITY CERTIFICATION DPT Paolo BONAITA	RESPONSABILE SERVIZIO QUALITA' QUALITY SERVICE MANAGER Sergio BERTINO

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
VBI/Section No. 02852
Date: 3-3-2010
Signature: 

Il presente certificato non sostituisce il certificato canonico definitivo che sarà il solo a fare fede ed ogni effetto di legge
le potreste non ripetere la firma del rappresentante del cliente.

Questo certificato è emesso da un sistema computerizzato ed è valido senza firma. Il certificato originale riporta il
marchio "Tenaris" in colore verde. Il possessore dell'originale custodirà il suo copia, deve custodirla a suo
piacere la conforma: assumendo ogni responsabilità per un ricorso o semplicemente non consentendo di essere
Attestazione della falsificazione saranno perseguite a tutti gli effetti di legge.

This certificate doesn't replace the definitive paper certificate which will be the only one valid to law purpose
and it could not include the inspector/customer signature.

This certificate is issued by a computerized system and it is valid without signature. On the original certificate the
mark "Tenaris" is stamped. The owner of the original certificate must keep a copy of it. He must be still in conformity to the original one taking upon himself the responsibility for any alteration
or not allowed use. Any alteration and/or falsification will be subjected to the law.

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORN AVE, ETOBICOKE, ONTARIO, CANADA M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 12/10/2009
SPECIFICATION: A139-B
DIA. and WALL: 34" O.D. X .375 W.T.
HYDROTEST: 830 PSI FOR 10 Sec.

CUSTOMER:
CUSTOMER'S P.O.: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
40832820	142	52018	75762	33	78262	PM
* → 40832840	158	53335	74789	33	77289	PM
* → 742578	162	70000	80000	29	82500	PM

LADLE ANALYSIS:

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
40832820	0.2	0.82	0.002	0.007	0.03					0.018
✓ 40832840	0.2	0.81	0.004	0.007	0.04					0.018
✓ 742578	0.06	0.67	0.006	0.004	0.1	0.03	0.01	0.02	0.005	0.03

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No: 02852
Date: 12-23-2009
Signature: *[Signature]*

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE

[Signature]
Authorized Approval

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNBY AVENUE, ETOBICOKE, ONTARIO, CANADA M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 10/26/2009
SPECIFICATION: A139-B
DIA. and WALL: 34" O.D. X .375 W.T.
✓ HYDROTEST: R30 PSI FOR 10 Sec.

CUSTOMER:
CUSTOMER'S P.O. #: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
742568	39	72000	81000	29	83500	PM
742577	33	67000	73000	29	75500	PM
742581	43	62000	71000	29	73500	PM
742596	47	68000	79000	28	81500	PM
742598	28	70000	80000	27	82500	PM

LADLE ANALYSIS

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
742568	0.06	0.75	0.002	0.006	0.14	0.02	0.02	0.06	0.008	0.046
742577	0.05	0.58	0.005	0.004	0.1	0.02	0.03	0.1	0.01	0.041
742581	0.06	0.6	0.004	0.004	0.09	0.02	0.01	0.02	0.008	0.035
742596	0.06	0.52	0.006	0.009	0.12	0.03	0.02	0.15	0.007	0.047
742598	0.06	0.56	0.005	0.004	0.1	0.03	0.03	0.08	0.008	0.042

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submital
YBI/Section No: 02852
Date: 12-23-2009
Signature: *[Signature]*

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE

[Signature]
Authorized Approval

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNER AVENUE, ETOBICOKE, ONTARIO, CANADA M8Z 4Y4
TELEPHONE: (416) 259-1113, FAX: (416) 259-6951

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 10/26/2009
SPECIFICATION: A139-B
DIA. and WALL: 34" O.D. X .375 W.T.
HYDROTEST: 830 PSI FOR 10 Sec.

CUSTOMER: P&P
CUSTOMER'S P.O.: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
184048	21	63000	74000	32	76500	PM
* → 30832790	6	50955	73880	32	76380	PM
30832800	16	50152	75742	33	78242	PM
* → 30832820	10	57112	80419	26	82919	PM
742573	1	64000	75000	25	77500	PM

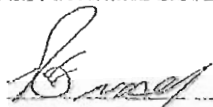
LADLE ANALYSIS

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
184048	0.0571	0.63	0.003	0.01	0.08	0.06	0.05	0.18	0.015	0.014
30832790	0.2	0.84	0.003	0.008	0.02					0.017
30832800	0.2	0.81	0.003	0.007	0.02					0.018
30832820	0.2	0.85	0.002	0.008	0.04					0.023
742573	0.07	0.6	0.005	0.004	0.1	0.02	0.02	0.08	0.011	0.046

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 12-23-2009
Signature: 

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE


Authorized Approval

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNER AVENUE, ETOBICOKE, ONTARIO, CANADA M8Z 4Y4
TELEPHONE: (416) 259-1113, FAX: (416) 259-6951

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 10/26/2009
SPECIFICATION: A139-B
DIA. and WALL: 34" O.D. X .375 W.T.
HYDROTEST: 830 PSI FOR 10 Sec.

CUSTOMER: P&P
CUSTOMER'S P.O.: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
742568	39	72000	81000	29	83500	PM
* → 742577	33	67000	73000	29	75500	PM
742581	43	62000	71000	29	73500	PM
742596	47	68000	79000	28	81500	PM
742598	28	70000	80000	27	82500	PM

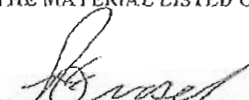
LADLE ANALYSIS

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
742568	0.06	0.75	0.002	0.006	0.14	0.02	0.02	0.06	0.008	0.046
742577	0.05	0.58	0.005	0.004	0.1	0.02	0.03	0.1	0.01	0.041
742581	0.06	0.6	0.004	0.004	0.09	0.02	0.01	0.02	0.008	0.035
742596	0.06	0.62	0.006	0.009	0.12	0.03	0.02	0.15	0.007	0.047
742598	0.06	0.66	0.005	0.004	0.1	0.03	0.03	0.08	0.008	0.042

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submitted
YBI/Section No. 02852
Date: 12-23-2009
Signature: 

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE


Authorized Approval



沧州市螺旋钢管有限责任公司

Cangzhou Spiral Steel Pipe Co., Ltd

钢管质量证明书

MILL TEST CERTIFICATE



客户 Customer: OZONE INDUSTRIES

合同编号 Contract No.:

OZ081808008

证书编号 Certificate No.: 01-047.5.5-07081212

品名 Product name: Spiral steel pipe

钢级 Steel Grade:

Gr.B PSLI

到站 Destination: MOBILE, USA

Pipes No.	炉号 Heat Numbers	规格(Size)			数量Quantity			化 学 成 分 Chemical Composition (%)					焊 接 接 头 物 理 性 能 physical properties of welding joints			管 体 物 理 性 能 physical properties of pipes				无损检测 NDT		水压 试验 Hydrostatic (10s) Mpa	尺寸 及外观 size & appearance
		直径	厚度	长度	支数	总长度	总重量	C	Mn	Si	P	S	σ _b Mpa	正弯	反弯	σ _s Mpa	σ _b Mpa	δ (%)	冷弯	UT	RT		
		O.D.	W.T.	length	Pieces	length	Weight							face-bend	back-bend				cold-bent				
		in	in	ft	(Pcs)	(ft)	(MT)							180°	180°				180°				
1	81-07520	34	0.375	30	19	741	44.8	0.09	0.96	0.21	0.020	0.020	485	pass	pass	350	485	30	pass	pass	pass	3.2	pass
2	82-09368	34	0.375	39	6	234	14.147	0.06	1.03	0.20	0.020	0.013	450	pass	pass	300	460	30	pass	pass	pass	3.2	pass
3	80-09149	34	0.375	39	6	234	14.147	0.08	0.97	0.20	0.021	0.015	485	pass	pass	350	485	34	pass	pass	pass	3.2	pass
4	80-09198	16	0.375	39	26	1014	28.808	0.07	0.96	0.20	0.025	0.012	440	pass	pass	295	440	34	pass	pass	pass	6.6	pass
Total					57	2223	101.902																

兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求。

The Spiral steel pipes are tested according to API 5L Gr.B and ASTM A139 Gr.B. This is to certify that in accordance with the relevant specifications and contracts.

The Spiral steel pipes manufactured were tested and qualified by our Quality Control Department.



日期 Date: SEP-09-2008

CUNGUO BROTHERS, INC.
has Received This Shop Drawing/Submittal
Date: 12-23-2009
Signature: [Signature]



YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submitted
YBI/Section No. 02852
Date: 12-23-2009
Signature: *[Signature]*

沧州市螺旋钢管有限责任公司
Cangzhou Spiral Steel Pipe Co., Ltd
钢管质量证明书
MILL TEST CERTIFICATE

许可证
编号: TS2710887-2010

客户 Customer: OZONE INDUSTRIES 合同编号 Contract No.: OZ100708009 证书编号 Certificate No.: CL/QR7.5.5-07081320
品名 Product name: Spiral steel pipe 钢级 Steel Grade: Gr.B PSL1 到站 Destination: MIAMI, USA

Pipes No.	炉号 Heat Numbers	规格(Size)			数量Quantity			化 学 成 分 Chemical Composition (%)					焊 接 接 头 物 理 性 能 physical properties of welding joints			管 体 物 理 性 能 physical properties of pipes				无损检验 NDT		水压 试验 Hydrostatic (10s) Mpa	尺寸 及外观 size & appearance
		直径	厚度	长度	支数	总长度	总重量	C	Mn	Si	P	S	o b Mpa	正弯	反弯	o s Mpa	o b Mpa	δ (%)	冷弯	UT	RT		
		O.D.	W.T.	lenth	Pieces	lenth	Weight							face-bend	back-bend				cold-bend				
		in	in	ft	(Pcs)	(ft)	(MT)							180°	180°				180°				
1	81-11074	34	0.375	39	9	351	21.456	0.07	0.82	0.11	0.018	0.014	460	pass	pass	360	460	33	pass	pass	pass	3.2	pass
2	82-10836	34	0.375	39	8	312	19.072	0.05	1.07	0.20	0.017	0.013	440	pass	pass	335	440	35.5	pass	pass	pass	3.2	pass
3	82-10835	34	0.375	39	2	78	4.768	0.08	1.12	0.20	0.019	0.020	435	pass	pass	335	435	32	pass	pass	pass	3.2	pass
4	82-10838	34	0.375	39	3	117	7.152	0.07	0.99	0.20	0.017	0.014	480	pass	pass	390	480	33	pass	pass	pass	3.2	pass
5	82-10736	34	0.375	39	3	117	7.152	0.07	0.96	0.21	0.020	0.020	420	pass	pass	330	420	39	pass	pass	pass	3.2	pass
6	81-11080	34	0.375	39	3	117	7.152	0.06	1.15	0.20	0.020	0.014	450	pass	pass	375	450	35	pass	pass	pass	3.2	pass
7	81-11081	34	0.375	39	3	117	7.152	0.07	1.08	0.23	0.018	0.016	445	pass	pass	375	445	36.5	pass	pass	pass	3.2	pass
Total					31	1209	73.904																

兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求。

The Spiral steel pipes are tested according to API 5L Gr.B and ASTM A139 Gr.B. This is to certify that in accordance with the relevant specifications and contracts.

The Spiral steel pipes manufactured were tested and qualified by our Quality Control Department.

检验员: 尹桂花
INSPECTOR: *[Signature]*

许可证号:
LICENCE: 5L-0640

日期 Date: NOV-06-2008



沧州市螺旋钢管有限责任公司

Cangzhou Spiral Steel Pipe Co., Ltd

钢管质量证明书

MILL TEST CERTIFICATE



客户 Customer: OZONE INDUSTRIES

合同编号 Contract No.:

OZ081808008

证书编号 Certificate No.: 01-047.5.5-07081212

品名 Product name: Spiral steel pipe

钢级 Steel Grade:

Gr.B PSLI

到站 Destination: MOBILE, USA

Pipes No.	炉号 Heat Numbers	规格(Size)			数量Quantity			化 学 成 分 Chemical Composition (%)					焊 接 接 头 物 理 性 能 physical properties of welding joints			管 体 物 理 性 能 physical properties of pipes				无损检测 NDT		水压 试验 Hydrostatic (10s) Mpa	尺寸 及外观 size & appearance
		直径	厚度	长度	支数	总长度	总重量	C	Mn	Si	P	S	σ _b Mpa	正弯	反弯	σ _s Mpa	σ _b Mpa	δ (%)	冷弯	UT	RT		
		O.D.	W.T.	length	Pieces	length	Weight							face-bend	back-bend				cold-bend				
		in	in	ft	(Pcs)	(ft)	(MT)							180°	180°				180°				
1	81-07520	34	0.375	30	19	741	44.8	0.09	0.96	0.21	0.020	0.020	485	pass	pass	350	485	30	pass	pass	pass	3.2	pass
2	82-09368	34	0.375	39	6	234	14.147	0.06	1.03	0.20	0.020	0.013	450	pass	pass	300	460	30	pass	pass	pass	3.2	pass
3	80-09149	34	0.375	39	6	234	14.147	0.08	0.97	0.20	0.021	0.015	485	pass	pass	350	485	34	pass	pass	pass	3.2	pass
4	80-09198	16	0.375	39	26	1014	28.808	0.07	0.96	0.20	0.025	0.012	440	pass	pass	295	440	34	pass	pass	pass	6.6	pass
Total					57	2223	101.902																

兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求。

The Spiral steel pipes are tested according to API 5L Gr.B and ASTM A139 Gr.B. This is to certify that in accordance with the relevant specifications and contracts.

The Spiral steel pipes manufactured were tested and qualified by our Quality Control Department.



日期 Date: SEP-09-2008

CUNGUO BROTHERS, INC.
has Received This Shop Drawing/Submittal
Date: 12-23-2009
Signature: [Signature]



YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submitted
YBI/Section No. 02852
Date: 12-23-2009
Signature: *[Signature]*

沧州市螺旋钢管有限责任公司
Cangzhou Spiral Steel Pipe Co., Ltd
钢管质量证明书
MILL TEST CERTIFICATE

许可证
编号: TS2710887-2010

客户 Customer: OZONE INDUSTRIES 合同编号 Contract No.: OZ100708009 证书编号 Certificate No.: CL/QR7.5.5-07081320
品名 Product name: Spiral steel pipe 钢级 Steel Grade: Gr.B PSL1 到站 Destination: MIAMI, USA

Pipes No.	炉号 Heat Numbers	规格(Size)			数量Quantity			化 学 成 分 Chemical Composition (%)					焊 接 接 头 物 理 性 能 physical properties of welding joints			管 体 物 理 性 能 physical properties of pipes				无损检验 NDT		水压 试验 Hydrostatic (10s) Mpa	尺寸 及外观 size & appearance
		直径	厚度	长度	支数	总长度	总重量	C	Mn	Si	P	S	o b Mpa	正弯	反弯	o s Mpa	o b Mpa	δ (%)	冷弯	UT	RT		
		O.D.	W.T.	lenth	Pieces	lenth	Weight							face-bend	back-bend				cold-bend				
		in	in	ft	(Pcs)	(ft)	(MT)							180°	180°				180°				
1	81-11074	34	0.375	39	9	351	21.456	0.07	0.82	0.11	0.018	0.014	460	pass	pass	360	460	33	pass	pass	pass	3.2	pass
2	82-10836	34	0.375	39	8	312	19.072	0.05	1.07	0.20	0.017	0.013	440	pass	pass	335	440	35.5	pass	pass	pass	3.2	pass
3	82-10835	34	0.375	39	2	78	4.768	0.08	1.12	0.20	0.019	0.020	435	pass	pass	335	435	32	pass	pass	pass	3.2	pass
4	82-10838	34	0.375	39	3	117	7.152	0.07	0.99	0.20	0.017	0.014	480	pass	pass	390	480	33	pass	pass	pass	3.2	pass
5	82-10736	34	0.375	39	3	117	7.152	0.07	0.96	0.21	0.020	0.020	420	pass	pass	330	420	39	pass	pass	pass	3.2	pass
6	81-11080	34	0.375	39	3	117	7.152	0.06	1.15	0.20	0.020	0.014	450	pass	pass	375	450	35	pass	pass	pass	3.2	pass
7	81-11081	34	0.375	39	3	117	7.152	0.07	1.08	0.23	0.018	0.016	445	pass	pass	375	445	36.5	pass	pass	pass	3.2	pass
Total					31	1209	73.904																

兹证明本表所列产品,均依材料规格制造及试验,并符合规格之要求。

The Spiral steel pipes are tested according to API 5L Gr.B and ASTM A139 Gr.B. This is to certify that in accordance with the relevant specifications and contracts.

The Spiral steel pipes manufactured were tested and qualified by our Quality Control Department.

检验员: 尹桂花
INSPECTOR:
许可证号:
LICENCE: 5L-0640

日期 Date: NOV-06-2008



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MITTAL

INSPECTION CERTIFICATE: 4902251307

ACCORDING TO: EN 10204/3.1.B

CUSTOMER:

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL ASPECT: SUITABLE

DATE 3-May-06

ORDER:

STANDARD:

DELIVERY STATE:

LOT:

900024/60002121

API SL 42 EDITION; API 2B FOR DIMENSIONAL
TOLERANCES; STRAIGHTNESS MAX. 0.561
INACE MR 0176 FOR HARDNESS

EXPANDED, BEVELLED ENDS AT 30°; V=1,0

MECHANICAL TESTS

TOTAL NO OF PIECES

48

TOTAL WEIGHT: 249792 lbs

NO. CRT	NO. PIPE	NO. HEAT	QUALITY	DIA MET ER [inch]	LENGTH [feet]	THICKN ESS [inch]	WEIGHT [lbs]	NO TEST	DIREC TION	DIA OF SPECIMENS [inch] BASE MATERIAL	RM [psi] BASE MATE RIAL	RE [psi] BASE MATE RIAL	A [%] BASE MATE RIAL	RE / RM [%]	DIA OF SPECIMENS [inch] WELD	RM [psi] WELD	HARDNESS HV 10 FOR BASE MATERIAL	GUIDED BEND TEST TRANS	IMPACT TEST NOTCH FOR BASE MATERIAL	HYDRO STATIC TEST 1030 psi/10 SEC	X RAY INVESTI GATION ACC. ISO WIRE 4%
1	167054	923558	X52-X42-B PSL	34	38.68	0.375	5215.67	167079	TRANS.	1.48x0.40	75409	58065	35	0.77	1.50x0.40	79357	156	SUITABLE		SUITABLE	SUITABLE
2	167055			34	38.65	0.375	5211.28													SUITABLE	SUITABLE
3	167056			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
4	167057			34	38.58	0.375	5202.44													SUITABLE	SUITABLE
5	167058			34	38.65	0.375	5211.28													SUITABLE	SUITABLE
6	167051			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
7	167053			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
8	167065			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
9	167066			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
10	167077			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
11	167079			34	37.11	0.375	5003.93													SUITABLE	SUITABLE
12	167080			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
13	167081			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
14	167084			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
15	167086			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
16	167087			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
17	167089			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
18	167116			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
19	167117			34	38.52	0.375	5193.82													SUITABLE	SUITABLE
20	167112	923597		34	38.68	0.375	5215.67	167125	TRANS.	1.54x0.38	74268	53595	34	0.721	1.57x0.38	75523	163	SUITABLE		SUITABLE	SUITABLE
21	167114			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
22	167115			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
23	167122			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
24	167123			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
25	167124			34	38.62	0.375	5203.85													SUITABLE	SUITABLE
26	167126			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
27	167127			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
28	167128			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
29	167130			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
30	167134			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
31	167138			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
32	167139			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
33	167140			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
34	167141			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
35	167173			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
36	166999	933881		34	38.08	0.375	5215.67	167090	TRANS.	1.50x0.38	73218	56082	40	0.765	1.50x0.38	74776	156	SUITABLE		SUITABLE	SUITABLE
37	167001			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
38	167070			34	38.42	0.375	5180.39													SUITABLE	SUITABLE
39	167071			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
40	187090			34	37.01	0.375	4990.73													SUITABLE	SUITABLE
41	167092			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
42	167093			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
43	167094			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
44	167097			34	38.65	0.375	5211.26													SUITABLE	SUITABLE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YB Section Nos 02852
Date 12-23-2009
Signature: [Signature]

CUSTOMER:

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL ASPECT: SUITABLE

DATE 3-May-05

ORDER:

900024/50002121

STANDARD:

API 6L 42 EDITION; API 2B FOR DIMENSIONAL
TOLERANCES; STRAIGHTNESS MAX. 0.661
"; NACE MR 0176 FOR HARDNESS

DELIVERY STATE:

EXPANDED, BEVELLED ENDS AT 30°; V=1.0

LOT:

MECHANICAL TESTS

TOTAL NO. OF PIECES

48

TOTAL WEIGHT 249792 LBS

NO CMT	NO. PIPE	NO. HEAT	QUALITY	DIAMET ER (inch)	LENGTH (feet)	THICKN ESS (inch)	WEIGHT (lbs)	NO. TEST	DIREC TION	DIM. OF SPECIMENS (inch) BASE MATERIAL	RM(psi) BASE MATE RIAL	RE(psi) BASE MATE RIAL	APM BASE MATE RIAL	RE/ RM (%)	DIM. OF SPECIMENS (inch) WELD	RM(psi) WELD	HARDNESS HV 10 FOR BASE MATERIAL	GUIDED BEND TEST TRANS	IMPACT TEST NOTCH FOR BASE MATERIAL	HYDRO STATIC TEST 100% psi/1000 psi/1000	X RAY INVESTI GATIONS ADD. 50% WIRE 4%
45	167102	933881		34	38.68	0.375	5215.67													SUITABLE	SUITABLE
46	167103		✓	34	38.68	0.375	5215.87													SUITABLE	SUITABLE
47	167104			34	38.68	0.375	5215.87													SUITABLE	SUITABLE
48	167105			34	38.68	0.375	5215.87													SUITABLE	SUITABLE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section Nos. 02852
Date: 12-23-2009
Signature: *[Signature]*





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Fax: +40 236 407 635
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MITTAL

INSPECTION CERTIFICATE: 4902251307

ACCORDING TO: EN 10204/3.1.B

CUSTOMER:

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL ASPECT: SUITABLE

DATE: 03-May-05

ORDER: 900024/50002121

API 5L 42 EDITION; API 2B FOR DIMENSIONAL

STANDARD: TOLERANCES; STRAIGHTNESS MAX. 0.551 " ; NACE MR 0175
FOR HARDNESS

DELIVERY STATE: EXPANDATED, BEVELLED ENDS AT 30° ; V=1.0

LOT:

CHEMICAL ANALYSIS, %

	No. Heat	C	MN	SI	P	S	AL	CU	CR	NI	V	MO	TI	NB	B	AS	N2 bellow	H2	ZR
✓ 1	923558	0.12	1.14	0.32	0.014	0.013	0.090	0.020	0.010	0.230	0.03	0.001	0.001	0.006					
✓ 2	923597	0.09	1.07	0.26	0.015	0.010	0.055	0.020	0.020	0.210	0.04	0.001	0.006	0.002					
✓ 3	933881	0.11	1.20	0.24	0.025	0.010	0.045	0.010	0.010	0.230	0.03	0.001	0.006	0.001					

"THIS DOCUMENT CERTIFIES THAT THE MATERIALS ABOVE INDICATED HAVE BEEN INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS MENTIONED AND NACE 0175 FOR HARDNESS."

INSPECTOR NAME
GABRIELA PRODAN



YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 12-23-2004
Signature: *[Signature]*



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Phone: +40 236 407 833
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MITTAL

INSPECTION CERTIFICATE: 4902251610
ACCORDING TO: EN 10204/3.1.8

CUSTOMER:		ORDER:	900024/60002121
PRODUCT:	DSAW CARBON STEEL LINE PIPE	STANDARD:	API 6L 42 EDITION; API 2B FOR DIMENSIONAL TOLERANCES; STRAIGHTNESS MAX. 0.5% NACE MR 0175 FOR HARDNESS
EXTERNAL ASPECT: SUITABLE		DELIVERY STATE:	EXPANDED, BEVELLED ENDS AT 90° V=1.0
DATE 30-May-06		LOT:	

MECHANICAL TESTS

TOTAL NO OF PIECES 39 TOTAL WEIGHT: 202882 lbs

NO CRT	NO PIPE	NO. HEAT	QUALITY	DIAMETER (inch)	LENGTH (feet)	THICKNESS (inch)	WEIGHT (lbs)	NO. TEST	DIRECTION	DIM OF SPECIMENS (inch) BASE MATERIAL	RM (psi) BASE MATERIAL	RE (psi) BASE MATERIAL	A (%) BASE MATERIAL	RE/ RM (%)	DIM OF SPECIMENS (inch) WELD	RM (psi) WELD	HARDNESS HV 10 FOR BASE MATERIAL	GUIDED BEND TEST TRANS	IMPACT TEST NOTCH FOR BASE MATERIAL	HYDRO STATIC TEST 1030 PSI/10 SEC	X RAY INVESTIGATION ACC ISO 9001:2004
1	168863	919193	X52-X42-B PSL1	34	38.70	0.375	5217.88	168178	TRANS.	1.50x0.39	78842	61702	30	0.782	1.50x0.39	78955	173	SUITABLE	SUITABLE	SUITABLE	SUITABLE
2	168864			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
3	165928	922778		34	38.68	0.375	5215.67	165883	TRANS.	1.53x0.38	83510	62253	34	0.745	1.50x0.37	90704	196	SUITABLE	SUITABLE	SUITABLE	SUITABLE
4	167067	923558		34	38.39	0.375	5175.98	167079	TRANS.	1.48x0.40	75409	58055	38	0.77	1.50x0.40	79357	156	SUITABLE	SUITABLE	SUITABLE	SUITABLE
5	167082			34	38.35	0.375	5171.56													SUITABLE	SUITABLE
6	167083			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
7	167085			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
8	167439			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
9	167111	923597		34	38.68	0.375	5215.67	167125	TRANS.	1.54x0.38	74268	53585	34	0.721	1.57x0.38	75523	163	SUITABLE	SUITABLE	SUITABLE	SUITABLE
10	167370			34	38.39	0.375	5175.98													SUITABLE	SUITABLE
11	167438			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
12	168837	924747		34	38.70	0.375	5217.88	168848	TRANS.	1.53x0.39	75154	58040	36	0.772	1.53x0.38	77437	179	SUITABLE	SUITABLE	SUITABLE	SUITABLE
13	168838			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
14	168839			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
15	168840			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
16	168841			34	38.62	0.375	5206.85													SUITABLE	SUITABLE
17	168842			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
18	168843			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
19	168844			34	38.55	0.375	5198.03													SUITABLE	SUITABLE
20	168845			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
21	168846			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
22	168847			34	38.70	0.375	5217.88													SUITABLE	SUITABLE
23	168848			34	37.04	0.375	4985.14													SUITABLE	SUITABLE
24	168849			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
25	168850			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
26	168851			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
27	168852			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
28	168853			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
29	168854			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
30	168855			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
31	168856			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
32	168857			34	38.65	0.375	5211.26													SUITABLE	SUITABLE
33	168858			34	38.19	0.375	5149.57													SUITABLE	SUITABLE
34	168859			34	38.58	0.375	5202.44													SUITABLE	SUITABLE
35	168860			34	38.58	0.375	5202.44													SUITABLE	SUITABLE
36	168861			34	38.62	0.375	5206.85													SUITABLE	SUITABLE
37	168862			34	38.68	0.375	5215.67													SUITABLE	SUITABLE
38	167091	933881		34	38.42	0.375	5180.39	167090	TRANS.	1.50x0.38	73218	56082	40	0.785	1.50x0.38	74776	156	SUITABLE	SUITABLE	SUITABLE	SUITABLE
39	167095			34	38.68	0.375	5215.67													SUITABLE	SUITABLE

QUINGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
BY/Section No. 02852
Date 12-23-2009
Signature [Signature]



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MITTAL

INSPECTION CERTIFICATE: 4902251610

ACCORDING TO: EN 10204/3.1.B

CUSTOMER:

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL ASPECT: SUITABLE

DATE: 30-May-05

ORDER: 900024/50002121

STANDARD: API 5L 42 EDITION; API 2B FOR DIMENSIONAL TOLERANCES; STRAIGHTNESS MAX. 0.551 " ; NACE MR 0175 FOR HARDNESS

DELIVERY STATE: EXPANDATED, BEVELLED ENDS AT 30°; V=1,0

LOT:

CHEMICAL ANALYSIS, %

	No. Heat	C	MN	SI	P	S	AL	CU	CR	NI	V	MO	TI	NB	B	AS	N2 bellow	H2	ZR
1	919193	0.08	1.15	0.26	0.016	0.008	0.047	0.020	0.01	0.01	0.03	0.001	0.006	0.045					
2	922778	0.08	1.14	0.21	0.019	0.007	0.055	0.020	0.03	0.03	0.04	0.002	0.003	0.033					
3	923558	0.12	1.14	0.32	0.014	0.013	0.090	0.020	0.010	0.230	0.03	0.001	0.001	0.006					
4	923597	0.09	1.07	0.26	0.015	0.010	0.055	0.020	0.020	0.210	0.04	0.001	0.006	0.002					
5	924747	0.09	1.18	0.26	0.015	0.010	0.040	0.030	0.02	0.02	0.05	0.003	0.019	0.044					
6	933881	0.11	1.20	0.24	0.025	0.010	0.045	0.010	0.010	0.230	0.03	0.001	0.006	0.001					

"THIS DOCUMENT CERTIFIES THAT THE MATERIALS ABOVE INDICATED HAVE BEEN INSPECTED IN ACCORDANCE WITH THE SPECIFICATIONS MENTIONED AND NACE 0175 FOR HARDNESS."

INSPECTOR NAME
MARIANA LUNGU



QUINGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
7B/Section No. 02852
Date: 12-23-2009
Signature: *[Signature]*

Smardan Street No.1; 800998; Galati, ROMANIA
Phone: +40 238 802888
Fax: +40 238 802887
<http://www.arcoformital.com/tubular/index.html>



Arceion Mital

INSPECTION CERTIFICATE: 4902260671
ACCORDING TO: EN 10204/3.1 / 2004

F CTC 001 REV 1

ARCELORMITTAL TUBULAR PRODUCTS GALATI S.R.L.

CUSTOMER: VASS PIPE & STEEL CO.

PRODUCT: DSAW CARBON STEEL LINE PIPE

ORDER:

1000100006/1015000164
API N. ED 44/ISO 3169/2007-API 2B FOR

STANDARD:

• DIMENSIONAL:

DELIVERY STATE:

MAX. 0.351" NACE MR 0175 FOR
EXPANDED, BEVELLED ENDS AT 30°;
V=1.0

EXTERNAL ASPECT: SUITABLE

P.O. : 23224R

DATE 1-Sep-09

MECHANICAL TESTS

TOTAL NO. OF PAGES 62

TOTAL WEIGHT: 4181.95 lbs

NO. CRT.	NO. PIPE	NO. HEAT	QUALITY	DIAMETER (Inch)	LENGTH (Feet)	THICK- NESS (Inch)	WEIGHT (Lbs.)	NO. TEST.	DIREC- TION	SPECIMENS (Inch) BASE MATERIAL	BASE MATE- RIAL	BASE MATE- RIAL	BASE MATE- RIAL	RCS RM (%)	SPECIMENS (Inch) WELD	DRLOW (Inch) WELD	HARDNESS (MPa) WELD	CHECKED WELD	BEND TEST TRANS.	IMPACT TEST TEMP 140 F	X-RAY EXAMIN- ATION
1	210923	931839	X 52N-L360N/X 42N-L230N/UEN-L23N	42	38.68	0.375	6455.08	210980	TRANS.	1.52x0.39	78430	63816	38	0.802	1.47x0.39	80205	162	SUITABLE	55-58-63	SUITABLE	SUITABLE
2	210924	931839		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
3	210925	931839		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	SUITABLE
4	210926	931839		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
5	210927	931839		42	38.48	0.375	6422.00												SUITABLE	SUITABLE	SUITABLE
6	210928	931839		42	38.58	0.375	6439.65												SUITABLE	SUITABLE	SUITABLE
7	210929	931839		42	38.45	0.375	6417.69												SUITABLE	SUITABLE	SUITABLE
8	210675	933480		42	38.62	0.375	6444.06	210674	TRANS.	1.47x0.38	76869	63091	44	0.82	1.45x0.39	82281	163	SUITABLE	55-66-69	SUITABLE	SUITABLE
9	210676	933480		42	38.08	0.375	6351.43												SUITABLE	SUITABLE	SUITABLE
10	210679	933480		42	38.62	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
11	210844	933480		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
12	211001	933480		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
13	211002	933480		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
14	210943	933481		42	38.68	0.375	6455.08	210952	TRANS.	1.49x0.40	76584	60825	40	0.802	1.50x0.40	72755	173	SUITABLE	58-67-64	SUITABLE	SUITABLE
15	210944	933481		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
16	210945	933481		42	38.42	0.375	6410.96												SUITABLE	SUITABLE	SUITABLE
17	210947	933481		42	38.12	0.375	6362.46												SUITABLE	SUITABLE	SUITABLE
18	210949	933481		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	SUITABLE
19	210950	933481		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
20	210954	933481		42	38.09	0.376	6355.84												SUITABLE	SUITABLE	SUITABLE
21	210955	933481		42	38.25	0.375	6384.51												SUITABLE	SUITABLE	SUITABLE
22	210956	933481		42	38.36	0.375	6399.85												SUITABLE	SUITABLE	SUITABLE
23	210989	933481		42	38.58	0.376	6455.08												SUITABLE	SUITABLE	SUITABLE
24	210990	933481		42	38.58	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
25	210891	933481		42	38.68	0.376	6455.08												SUITABLE	SUITABLE	SUITABLE
26	210993	933481		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
27	210994	933481		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
28	211132	933481		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
29	210715	933483		42	38.68	0.375	6455.08	210722	TRANS.	1.49x0.39	79103	64541	42	0.815	1.43x0.37	83541	164	SUITABLE	81-79-76	SUITABLE	SUITABLE
30	210718	933483		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE

pg. 13

YOUNGQUIST BROTHERS, INC.

Has Received This Shop Drawing/Submittal

YBI/Section No. 02352

Date: 11-30-2009

Signature: Chris B.

CUSTOMER: / VASS PIPE & STEEL CO.

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL
ASPECT: SUITABLE

DATE 1-Sep-09

ORDER:

STANDARD:

DELIVERY STATE:

1000100008H010000184
 API 5L ED 44/ISO 3183/200/API 2S FOR
 DIMENSIONAL
 TOLERANCES; STRAIGHTNESS
 MAX 0.551" NACE MR 0175 FOR
 EXPANDED, BEVELLED ENDS AT 50°;
 V=0
 P.O.: 23224RJ

MECHANICAL TESTS

TOTAL NO. OF PIECES 51

TOTAL WEIGHT: 328318 LBS

NO. CRT	NO. PIPE	NO. HEAT	QUALITY	DIAMETER [inch]	LENGTH [foot]	THICKNESS [inch]	WEIGHT [lbs.]	NO. TEST	DIRECTION	DEVELOP SPECIMENS [inch] BASE MATERIAL	RING BASE MATERIAL	REINFORCING BASE MATERIAL	API BASE MATERIAL	REINFORCING BASE MATERIAL	DIA. OF SPECIMENS [inch] WELD	RING WELD	HARDNESS HV 10 FOR BASE MATERIAL	CLASSED BASE TEST TRANS.	IMPACT TEST NOTCH FOR BASE MATERIAL 32°F 15 FT-LB	HYDROSTATIC TEST 840 PSI/1000 SEC	X-RAY INVESTIGATION 100%
31	210917	910809	X 52N-L350N/X42N-L230N/BN-L245N	42	38.65	0.375	6450.67													SUITABLE	SUITABLE
32	210918	910809		42	38.55	0.375	6433.03													SUITABLE	SUITABLE
33	210919	910809		42	38.25	0.375	6384.51													SUITABLE	SUITABLE
34	210920	910809		42	38.65	0.375	6450.67													SUITABLE	SUITABLE
35	210921	910809		42	38.65	0.375	6450.67													SUITABLE	SUITABLE
36	211130	910809		42	38.65	0.375	6450.67													SUITABLE	SUITABLE
37	211131	910809		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
38	211200	920324		42	38.68	0.375	6455.08	211212 TRANS. 1.47x0.48	70923	59564	40	0.797	1.45x0.40	76395	164	SUITABLE	59-61-68			SUITABLE	SUITABLE
39	211202	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
40	211204	920324		42	38.65	0.375	6450.67													SUITABLE	SUITABLE
41	211207	920324		42	38.19	0.375	6373.48													SUITABLE	SUITABLE
42	211208	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
43	211211	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
44	211213	920324		42	38.65	0.375	6450.67													SUITABLE	SUITABLE
45	211214	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
46	211215	920324		42	38.70	0.375	6457.29													SUITABLE	SUITABLE
47	211224	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
48	211225	920324		42	38.62	0.375	6444.06													SUITABLE	SUITABLE
49	211226	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
50	211227	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE
51	211251	920324		42	38.68	0.375	6455.08													SUITABLE	SUITABLE

YOUNGQUIST BROTHERS, INC.
 Has Received This Shop Drawing/Submittal
 FBI/Section No. 02852
 Date: 11-30-2009
 Signature: *[Signature]*



Smardan Street No.1800683, Galati, ROMANIA
Phone: +40 226 802883
Fax: +40 226 802887
http://www.arcelormittal.com/tubular/index.html

ArcelorMittal

ARCELORMITTAL TUBULAR PRODUCTS GALATI S.R.L

INSPECTION CERTIFICATE: 4902260639

ACCORDING TO: EN 102543.1/2004

F CTC 001 REV 1

CUSTOMER:	VASS PIPE & STEEL CO.	ORDER:	1000100009H015000154 API 5L ED 44/ISO 3183-2007 API 2B FOR
PRODUCT:	DSAW CARBON STEEL LINE PIPE	STANDARD:	DIMENSIONAL: TOLERANCES: STRAIGHTNESS MAX. 0.531" IN 10' FOR EXPANDED, BEVELLED ENDS AT 90°
EXTERNAL ASPECT:	SUITABLE	DELIVERY STATE:	VH1.0
DATE 1-Sep-09			P.O.: 23221RJ

MECHANICAL TESTS

TOTAL NO. OF PIECES 51

TOTAL WEIGHT: 328318 lbs

NO. CRT	NO. PIPE	HQ. HEAT	QUALITY	DIAMETER (inch)	LENGTH (ft)	THICKNESS (inch)	WEIGHT (lbs)	NO. TEST	ORIG. TCH	DRILL SPECIMENS (inch) BASE MATERIAL	RND (inch) BASE MATERIAL	RE (inch) DATE	RT (inch) DATE	RT (inch) DATE	DM OF SPECIMENS (inch) WELD	RM (inch) WELD	HARDNESS HV 10 FOR BASE MATERIAL	GUIDED BEND TEST TRAN.	IMPACT TEST NOTCH FOR BASE MATERIAL 27°F 15 FT-LB	HYDROSTATIC TEST 840 PSI/SEC	X RAY RAY-201 GATION 100%
1	210941	910798	X 52N-L360N/X42N-L200N/BN-L245N	42	38.22	0.375	6377.90	210747	TRANS.	1.49x0.38	73534	57870	40	0.738	1.48x0.38	76578	164	SUITABLE	61-65-61	SUITABLE	SUITABLE
2	210956	910799		42	38.32	0.375	6396.54	210995	TRANS.	1.57x0.38	80060	57434	33	0.717	1.51x0.38	79420	172	SUITABLE	62-67-65	SUITABLE	SUITABLE
3	210957	910799		42	38.85	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
4	210998	910799		42	38.32	0.375	6395.54												SUITABLE	SUITABLE	SUITABLE
5	210999	910799		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
6	211000	910799		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	SUITABLE
7	210734	910808		42	38.68	0.375	6455.08	210857	TRANS.	1.51x0.40	78175	64251	40	0.821	1.45x0.40	74829	163	SUITABLE	73-75-76	SUITABLE	SUITABLE
8	210735	910808		42	38.88	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
9	210736	910808		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
10	210737	910808		42	38.63	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
11	210738	910808		42	38.35	0.375	6389.95												SUITABLE	SUITABLE	SUITABLE
12	210739	910808		42	38.39	0.375	6406.66												SUITABLE	SUITABLE	SUITABLE
13	210740	910808		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
14	210741	910808		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	SUITABLE
15	210742	910808		42	38.52	0.375	6426.62												SUITABLE	SUITABLE	SUITABLE
16	210743	910808		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
17	210745	910808		42	38.09	0.375	6365.84												SUITABLE	SUITABLE	SUITABLE
18	210746	910808		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
19	210856	910808		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
20	210858	910808		42	38.09	0.375	6365.84												SUITABLE	SUITABLE	SUITABLE
21	210707	910809		42	38.68	0.375	6455.08	210698	TRANS.	1.63x0.38	67457	62856	38	0.716	1.45x0.45	78465	172	SUITABLE	73-75-72	SUITABLE	SUITABLE
22	210709	910809		42	38.68	0.375	6439.65												SUITABLE	SUITABLE	SUITABLE
23	210730	910809		42	38.32	0.375	6395.54												SUITABLE	SUITABLE	SUITABLE
24	210732	910809		42	38.55	0.375	6433.03												SUITABLE	SUITABLE	SUITABLE
25	210733	910809		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
26	210748	910809		42	38.63	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
27	210749	910809		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
28	210902	910809		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	SUITABLE
29	210903	910809		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	SUITABLE
30	210916	910808		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	SUITABLE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 11-30-2009
Signature: *[Signature]*

PAGE 1/3

CUSTOMER: VASS PIPE & STEEL CO.

PRODUCT: DSAW CARBON STEEL LINE PIPE

EXTERNAL
ASPECT: SUITABLE

DATE 1-Sep-09

ORDER:

STANDARD:

DELIVERY STATE:

1001000061018000104

APSL ED 44/ISO 3182200/AM 125 HON

DIMENSIONAL

TOLERANCES: STRAIGHTNESS

MAX 0.51" MAX MR CITS FOR

EXPANDED, BEVELLED ENDS AT 30°

YmJ

P.O.: 2224R

MECHANICAL TESTS

TOTAL NO. OF PAGES 66

TOTAL WEIGHT: 423622 lbs

NO. CITY	NO. PIPE	NO. HEAT	QUALITY	DIAMETER [in.]	LENGTH [ft.]	THICK- NESS [in.]	WEIGHT [lbs.]	NO. TEST	DRILL TOM	DRILL SPECIMENS TYPICAL MATERIAL	RECEIPT BASE DATE REAL	RECEIPT BASE DATE REAL	AS- SAYE DATE REAL	REV. REM. [X]	DRILL SPECIMENS [in.]	WELD	HARDNESS BY 10 FOR BASE MATERIAL	GUIDED BEND TEST TRANS.	IMPACT TEST NOTCH FOR BASE MATERIAL 22° 15 FT/LB	HYDRO- STATIC TEST 24 psi/1000	X-RAY BATCH GARDEN 100%
31	210887	933489	X 52N-1360N0042N-1290NBN-1245N	42	38.65	0.375	6450.67												SUITABLE	SUITABLE	
32	210861	933489		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
33	210882	933491		42	38.68	0.375	6455.08	210939	TRANS.	1.50x0.38	76564	58305	42	0.771	1.50x0.37	78144	163	SUITABLE	62-65-66	SUITABLE	SUITABLE
34	210883	933491		42	37.01	0.375	6175.00												SUITABLE	SUITABLE	
35	210964	933491		42	38.29	0.375	6388.82												SUITABLE	SUITABLE	
36	210965	933491		42	38.55	0.375	6433.03												SUITABLE	SUITABLE	
37	210967	933491		42	38.22	0.375	6377.90												SUITABLE	SUITABLE	
38	210968	933491		42	38.52	0.375	6428.82												SUITABLE	SUITABLE	
39	210970	933491		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	
40	210972	933491		42	38.62	0.375	6444.06												SUITABLE	SUITABLE	
41	211133	933491		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
42	211232	933881		42	38.70	0.375	6457.29	211283	TRANS.	1.48x0.41	74549	58320	44	0.785	1.48x0.41	74250	150	SUITABLE	36-38-76	SUITABLE	SUITABLE
43	211233	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
44	211284	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
45	211285	933881		42	38.63	0.375	6455.08												SUITABLE	SUITABLE	
46	211286	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
47	211287	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
48	211288	933881		42	38.65	0.375	6450.67												SUITABLE	SUITABLE	
49	211289	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
50	211290	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
51	211291	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
52	211292	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
53	211293	933881		42	37.14	0.375	6187.06												SUITABLE	SUITABLE	
54	211294	933881		42	38.48	0.375	6422.00												SUITABLE	SUITABLE	
55	211295	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
56	211296	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
57	211297	933881		42	38.52	0.375	6428.82												SUITABLE	SUITABLE	
58	211298	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
59	211299	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
60	211300	933881		42	38.63	0.375	6439.85												SUITABLE	SUITABLE	
61	211301	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
62	211302	933881		42	38.68	0.375	6455.08												SUITABLE	SUITABLE	
63	211303	933881		42	38.22	0.375	6377.90												SUITABLE	SUITABLE	
64	211304	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
65	211305	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	
66	211306	933881		42	38.70	0.375	6457.29												SUITABLE	SUITABLE	

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YB/Section No. 02852
Date: 11-30-2009
Signature: *[Signature]*

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 11/17/2009
SPECIFICATION: A139-B
DIA. and WALL: 42" O.D. X .375 W.T.
HYDROTEST: 500 PSI FOR 10 Sec.

CUSTOMER:
CUSTOMER'S P.O.: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
742580	7	69000	79000	29	81500	PM
742582	3	67000	76000	30	78500	PM
742596	1	68000	79000	28	81500	PM

LADLE ANALYSIS

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
742580	0.06	0.66	0.005	0.004	0.1	0.02	0.02	0.07	0.006	0.042
742582	0.06	0.63	0.005	0.005	0.1	0.02	0.01	0.03	0.009	0.043
742596	0.06	0.62	0.006	0.009	0.12	0.03	0.02	0.15	0.007	0.047

YOUNGQUIST BROTHERS, INC.
Has Received Title Shop Drawing/Submittal
YBI/Section No: 02852
Date: 11-24-2009
Signature: *[Signature]*

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE

[Signature]
Authorized Approval

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE: 11/18/2009
SPECIFICATION: A139-B
DIA. and WALL: 42" O.D. X .375 W.T.
HYDROTEST: 500 PSI FOR 10 Sec.

CUSTOMER:
CUSTOMER'S P.O.: 8515
PHOENIX REF. #: 09-4310

Physical Properties

HEAT NO.	PIPE NO.	YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
10833000	26	53697	75487	31	77987	PM
742568	11	72000	81000	29	83500	PM
742574	18	65000	74000	32	76500	PM
742597	22	64000	73000	29	75500	PM
742598	15	70000	80000	27	82500	PM

LADLE ANALYSIS

Chemical Composition

HEAT NO.	C	MN	S	P	SI	CR	NI	CU	MO	AL
10833000	0.19	0.84	0.006	0.012	0.01					0.021
742568	0.06	0.75	0.002	0.006	0.14	0.02	0.02	0.06	0.008	0.046
742574	0.05	0.64	0.006	0.005	0.09	0.02	0.02	0.06	0.007	0.036
742597	0.07	0.63	0.004	0.006	0.11	0.03	0.02	0.11	0.007	0.035
742598	0.06	0.66	0.005	0.004	0.1	0.03	0.03	0.08	0.008	0.042

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 11-24-2009
Signature: *[Signature]*

THE MATERIAL LISTED ON THIS REPORT HAS BEEN TESTED IN ACCORDANCE WITH THE SPECIFICATIONS SHOWN ABOVE

[Signature]
Authorized Approval



MILL CERTIFICATE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No: 02852
Date: 11-24-2009
Signature: *[Signature]*

COMMODITY: CARBON STEEL PIPES AS PER ASTM A139 GR.B SPIRAL WELDED, NORMAL MILL BLACK LACQUER FOR RUST PROTECTION, ONE END OF THE PIPE SHALL HAVE A BEVEL OF 30 DEGREES WITH A TOLERANCE PLUS FIVE, MINUS ZERO DEGREES. THE OTHER END OF THE PIPE WILL BE PLAIN, RIGHT AND ANGLE CUT. ALL BURRS REMOVED.

CERTIFICATE NO: PSCNIN7601TC5
DATE OF ISSUE: 9/13/2007

CUSTOMER: OZONE INDUSTRIES CORPORATION
15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

The CARBON STEEL PIPES are tested according to ASTM A139 GR.B
This is to certify that in accordance with the relevant specifications and contracts.

Invoice No. SEUSFP7601TD3
LC NUMBER.: 64405427

The CARBON STEEL PIPES manufactured were tested and qualified by our Quality Control Department.

TOTAL : 112 PCS / 4368 FT / 330.631 MT

Pipes No.	Heat Numbers	Steel	Size			Quantity			Dimensional	TESTING RESULTS										Flattening	UT Test
			O.D.	W.T.	Length					CHEMICAL PROPERTIES(%)					PHYSICAL PROPERTIES			Welding properties	Hydrostatic Test Holding time:10s		
		Grade	in	in	ft	Pcs	ft	MT	Inspection	C	Si	Mn	P	S	σs(Mpa)	σb(Mpa)	δ5(%)	σb	P = Psi	Test (B)	Test (B)
1	1-9180	B	52	0.375	39	14	546	51.258	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK
2	1-9161	B	50	0.375	39	14	546	49.272	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
3	1-9161	B	48	0.375	39	14	546	47.286	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
* 4	1-9161	B	42	0.375	39	28	1092	82.658	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
5	1-9180	B	36	0.375	39	28	1092	70.743	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK
6	1-9161	B	30	0.375	39	14	546	29.414	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	522	OK	OK
TOTAL						112	4368	330.631													

YIEH CORPORATION LIMITED

[Signature]



YIEH CORPORATION LIMITED

MILL CERTIFICATE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submittal
YBI/Section No. 02852
Date: 11-9-2009
Signature: *[Signature]*

COMMODITY: CARBON STEEL PIPES AS PER ASTM A139 GR.B SPIRAL WELDED, NORMAL MILL BLACK LACQUER FOR RUST PROTECTION, ONE END OF THE PIPE SHALL HAVE A BEVEL OF 30 DEGREES WITH A TOLERANCE PLUS FIVE, MINUS ZERO DEGREES. THE OTHER END OF THE PIPE WILL BE PLAIN, RIGHT AND ANGLE CUT. ALL BURRS REMOVED.

CERTIFICATE NO: PSCN/JN7601TC5

DATE OF ISSUE: 9/13/2007

CUSTOMER: OZONE INDUSTRIES CORPORATION
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FORT MYERS, FL 33908

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This is to certify that in accordance with the relevant specifications and contracts.

Invoice No. SEUSFP7601TD3

LC NUMBER.: 64405427

The CARBON STEEL PIPES manufactured were tested and qualified by our Quality Control Department.

TOTAL : 112 PCS / 4368 FT / 330.631 MT

Pipes No.	Heat Numbers	Steel	Size			Quantity			Dimensional	TESTING RESULTS										Flattening	UT Test
			O.D.	W.T.	Length					CHEMICAL PROPERTIES(%)					PHYSICAL PROPERTIES			Welding properties	Hydrostatic Test Holding time:10s		
		Grade	in	in	ft	Pcs	ft	MT	Inspection	C	Si	Mn	P	S	σs(Mpa)	σb(Mpa)	δ5(%)	σb	P = Pst	Test (B)	Test (B)
1	1-9160	B	52	0.375	39	14	546	51.258	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK
2	1-9161	B	50	0.375	39	14	546	49.272	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
3	1-9161	B	48	0.375	39	14	546	47.286	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
4	1-9161	B	42	0.375	39	28	1092	82.658	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK
5	1-9160	B	36	0.375	39	28	1092	70.743	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK
6	1-9161	B	30	0.375	39	14	546	29.414	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	522	OK	OK
TOTAL						112	4368	330.631													

YIEH CORPORATION LIMITED

[Signature]

Inspection / Quality Certificate

<u>Job No:</u>	110000023	<u>Date:</u>	1/18/ 2006
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Fort Myers, Florida
<u>Certificate Number:</u>	FPI-2010-23	<u>Sales Order:</u>	62L000150
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	36- Joints (1080 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000023	1500	1875

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
 QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	110000082	<u>Date:</u>	5/11/ 2007
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Fort Myers, Florida
<u>Certificate Number:</u>	FPI-2010-24	<u>Sales Order:</u>	62L000150
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	115- Joints (3450 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000082	1500	1875

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	110000113	<u>Date:</u>	3/18/ 2008
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Fort Myers, Florida
<u>Certificate Number:</u>	FPI-2010-22	<u>Sales Order:</u>	62L000663
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	74- Joints (2220 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000113	1500	1875

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	100000151	<u>Date:</u>	11/10/ 2008
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Fort Myers, Florida
<u>Certificate Number:</u>	FPI-2010-22	<u>Sales Order:</u>	62L000893
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	75- Joints (2250 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	100000151	1500	1875

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
 QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	110000176	<u>Date:</u>	4/9/ 2010
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Hialeah, Florida
<u>Certificate Number:</u>	FPI-2010-9	<u>Sales Order:</u>	62L001127
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	31- Joints (930 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	110000176	1500	1850

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
 QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

Inspection / Quality Certificate

<u>Job No:</u>	100000194	<u>Date:</u>	4/27/ 2010
<u>Purchaser:</u>	Ozone	<u>Destination:</u>	Fort Myers, Florida
<u>Certificate Number:</u>	FPI-2010-18	<u>Sales Order:</u>	62L001136
<u>Product:</u>	6 5/8" RB 1500	<u>Quantity:</u>	7- Joints (200 ft)

We hereby certify that the piping materials supplied have been tested and with Future Pipe Industries' Downhole Pipe Specs.

Material Certificate

Item	Order Number	Rating	Test Pressure
Pipes	100000194	1500	1875

Pipe System: Aromatic Amine heat cured epoxy

Raw Material Specifications:

- Resin type: Epoxy
- Curing Agent: Aromatic Amine
- Glass Fiber: E-Type

Non Destructive Tests:

- Dimensional Exam: ASTM D 3567
- Visual Standards: API 15 HR Table 2

We hereby certify that the materials described above have been tested and comply with Future Pipe Industries' Downhole Pipe specifications.

Certificate of Conformity Statement:

All items delivered under this certificate number were manufactured in accordance with Future Pipe Industries' Downhole Pipe specifications.

Raymond Jones
QC Supervisor

Complete Pipe System Solutions

Accreditation



AMERICAS | EMEA | GCC | ASIA

ORIGINAL

MILL TEST QUALITY CERTIFICATE


Specification: PRIME NEWLY PRODUCED ERW BPE CARGON STEEL LINE PIPE ACCORDING TO API 5L
B / X-42 PSL-1(2004) MR0175 SPECIFICATIONS AND TOLERANCES.

SHIPPING MARKS: PO 60342 LOT 1 / HOUSTON / SIZE/WALL THICKNESS/SPEC.: API 5L GRADE B /
X-42 /PCS PER BUNDLE/LENGTH/HEAT NUMBER/WEIGHT IN LBS/MADE IN CHINA

Contract no. PO 60342 LOT 1

Destination: HOUSTON

DATE OF ISSUE : SPE/ 20/2007

Size	Outside diameter		12.75"(323.8MM)				
	Wall Thickness		0.375"(9.53MM)				
	Length		42'(12.802M)				
Sort			BPEB				
Heat No.			73-03493	73-03460	73-03491	73-03492	73-04103
Quantity	Bundles		109	61	102	98	130
	Pieces		500				
	Weight		472.565MT(1041810LBS)				
Physical analysis	Zinc Coat(g/m ²)		—	—	—	—	—
	Hydro Test(5S)(PSI)		2100	2100	2100	2100	2100
	Bend /flat test		OK	OK	OK	OK	OK
Tensile properties	Yield point(PSI)		45690	42790	43510	42790	43510
	Tensile strength(PSI)		63820	63090	62370	62370	63090
	Elongation(%)		33	34	35	33	34
Chemical composition (%)	C	×100	12	12	11	13	14
	Si		10	15	12	19	12
	Mn		55	51	49	55	52
	P	×1000	10	14	10	10	11
	S		28	25	28	24	20
	Cu		15	16	14	15	16
	Cr		11	14	10	12	14
	Ni		17	15	15	16	15
	Mo		3	4	2	3	4
	V		3	2	2	2	2
	Ti		7	6	6	6	6
	Nb		17	19	15	16	17
Appearance			OK	OK	OK	OK	OK
Dimension		OK	OK	OK	OK	OK	
U.T.		OK	OK	OK	OK	OK	
Welding Seam Heat Treatment		OK	OK	OK	OK	OK	
WE HERE CERTIFY THAT THE MATERIAL DESCRIBED HAS BEEN MANUFACTURED, TESTED IN ACCORDANCE WITH ABOVE STANDARD AND SPECIFICATION AND SATISFIED THE REQUIREMENTS.				SIGNATURE: 			

TEST NUMBER:HLD20070920



INTERPIPE
NMPP

OJSC "INTERPIPE NOVOMOSKOVSK
PIPE PRODUCTION PLANT"
115 SUCHKOV STR.
NOVOMOSKOVSK UKRAINE



INSPECTION CERTIFICATE
EN 10204 / 3.1

A01

Sheet 11 Sheets 14

DATE	09.04.08	201
CERT NO	2377/08	a03
DEL NOTE		a09

CUSTOMER

A05



LICENCE №
5L - 0304

INTERPIPE NMPP REF number

SALES

WORKS

Freight carN

Q-ty of
packs

Gross, lb
weight

Net, lb
weight

CUSTOMER ORDER № 08-1162

68461433

-

-

-

PRODUCT DESCRIPTION

Electric welded steel pipes acc to ASTM A53-06/API 5L PSL 2
43-th EDITION 2004 Grade B/X42

B01-04

06/A10

L=LONGITUDINAL T=TRANSVERSE B=BODY W=WELD KV=CHARPY V=NOTCH HV=HARDNESS VICKERS (10 KG LOAD) DT=DROP WEIGHT TEAR TEST

ITEM N	N OF PIECES	PRODUCT DIMENSIONS	HEAT N	LOT N	TENSILE TEST Dimensions of specimen					IMPACT TEST Dimensions of specimen					STEEL MAKING PROCESS BASIC OXYGENE STEEL				
					width: 1.5;1.5in length:7.874in	thickness: 0.359;0.356in type of test piece: W-F,B-E				width: 0.295in thickness: 0.394in									
							Yeld strength Re Psi	Tensile strength Rm Psi	Elongation A%	Hydro pressure Psi	Pla- ce and ori- enta- tion	Spe- si- men type	Test temperature, °F percussive viscosity, Ft-lb				OTHER TESTS		
													Impact1 +32°	Impact2 +32°	Impact3 +32°	Average +32°			
					C01, C02, C10		C11	C12	C13	D02	C01 C02	C40 C30							
1		12.75inODx0.375in 40.0-42.0ft	2051571	31485	W T B T		44.000;56.000	79.000;79.000		2100 10secs	BT	KV	27;36	32;48	40;40	33;41	FLATTENING TEST SATISFACTOR WELD LINE 100% US-TESTED UT SISE 12.75x0.375in N10 RESIDUAL MAGNETIZM 10.0-20.0 GAUSS THE MINIMUM TEMPERATURE FOR HEAT TREATMENT OF THE WELD SEAM 1634°F Hardness Rochwell < 22 HRC Weld repair isn't permitted		

C71-C94 ANALYSIS % LD-LADLE CH-CHECK										C	Si	Mn	P	S	N	Cr	Cu	Al	Ni	Mo	Ti	V	NB	Ca	O	Zr	CEV normal 0.43
Heat N 2051571 LD										0.20	0.24	0.55	0.012	0.004	0.005	0.02	0.06	-	0.03	0.004	-	0.006	-	-	-	-	-
2051571 CH										0.21	0.28	0.60	0.012	0.007	-	<0.05	0.036	0.030	0.034	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.33

THESE RESULTS ARE CERTIFIED BY INTERPIPE NMPP AND COMPLY WITH
THE REQUIREMENTS OF THE PRODUCT DESCRIPTION.

STAMP

001

TECHNICAL
CONTROL
DEPARTMENT
OF CERTIFICATION

SIGNATURE

Бланк серии 2Ж №

18941

201/202



INTERPIPE
NMPP

OJSC "INTERPIPE NOVOMOSKOVSK
PIPE PRODUCTION PLANT"
115 SUCHKOV STR.
NOVOMOSKOVSK UKRAINE



INSPECTION CERTIFICATE
EN 10204 / 3.1

A01

DATE	09.04.08	Z01
CERT. NO	2377/08	a03
DEL. NOTE		a09

Sheet 12 Sheets 14

CUSTOMER

A06



LICENCE №
SL - 0304

INTERPIPE NMPP REF number

SALES

WORKS

Freight carN

Q-ty of
packs

Gross, lb
weight

Net, lb
weight

CUSTOMER ORDER № 08-1162

68461433

-

-

-

A07

PRODUCT DESCRIPTION

Electric welded steel pipes acc to ASTM A53-06/API 5L PSL 2
43-th EDITION 2004 Grade B/X42

B01-04

06/A10

L=LONGITUDINAL T=TRANSVERSE B=BODY W=WELD KV=CHARPY V=NOTCH HV=HARDNESS VICKERS (10 KG LOAD) DT=DROP WEIGHT TEAR TEST

ITEM	N OF PIECES	PRODUCT DIMENSIONS	HEAT N	LOT N	TENSILE TEST Dimensions of specimen width: 1.5;1.5in length:7.874in thickness: 0.357;0.356in type of test piece: W-F,B-E					IMPACT TEST Dimensions of specimen width: 0.295in thickness: 0.394in				STEEL MAKING PROCESS BASIC OXYGENE STEEL			
					Yield strength Re Psi	Tensile strength Rm Psi	Elongation A%	Hydro pressure Psi	Pla- ce and ori- enta- tion C01 C02	Spe- si- men type C40 C30	Test temperature, °F percussive viscosity, Ft-lb				OTHER TESTS		
					C01, C02, C10	C11	C12	C13	D02	C02	Impact1 +32°	Impact2 +32°	Impact3 +32°	Average +32°			
B09	B10	B11-i3	B08	C00													
1		12.75inODx0.375in 40.0-42.0ft	2051571	32489	W T B T	42.000;56.000	80.000;81.000 74.000;74.000	41.0;40.0	2100 10secs	BT	KV	36;35	26;27	30;30	31;30	FLATTENING TEST SATISFACTOR WELD LINE 100% US-TESTED UT SIZE 12.75x0.375in N10 RESIDUAL MAGNETISM 10.0-20.0 GAUSS THE MINIMUM TEMPERATURE FOR HEAT TREATMENT OF THE WELD SEAM 1634°F Hardness Rockwell < 22 HRC Weld repair isn't permitted	

C71-C94 ANALYSIS % LD-LADLE CH-CHECK		C	Si	Mn	P	S	N	Cr	Cu	Al	Ni	Mo	Ti	V	NB	Ca	O	Zr	CEV normal 0.43
Heat N	2051571 LD	0.20	0.24	0.55	0.012	0.004	0.005	0.02	0.06	-	0.03	0.004	-	0.006	-	-	-	-	-
	2051571 CH	0.21	0.28	0.60	0.012	0.007	-	<0.05	0.036	0.030	0.034	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.33

THESE RESULTS ARE CERTIFIED BY INTERPIPE NMPP AND COMPLY WITH
THE REQUIREMENTS OF THE PRODUCT DESCRIPTION.

STAMP

TECHNICAL
CONTROL
DEPARTMENT
OF CERTIFICATION

SIGNATURE

Бланк серии 2Ж №

18945

Z01/Z02





INTERPIPE
NMPP

OJSC "INTERPIPE NOVOMOSKOVSK
PIPE PRODUCTION PLANT"
115 SUCHKOV STR.
NOVOMOSKOVSK UKRAINE



INSPECTION CERTIFICATE
EN 10204 / 3.1

A01

Sheet 13 Sheets 14

A02	DATE	09.04.08	z01
	CERT. NO	2377/08	a03
	DEL. NOTE		a09

CUSTOMER

A05



LICENCE №
5L - 0304

INTERPIPE NMPP REF number

SALES

WORKS

Freight carN

Q-ty of Gross, lb Net, lb
packs weight weight

CUSTOMER ORDER № 08-1162

68461433

-

-

-

A07

PRODUCT DESCRIPTION

Electric welded steel pipes acc to ASTM A53-06/API 5L PSL 2
43-th EDITION 2004 Grade B/X42

B01-04

05/A10

L=LONGITUDINAL T=TRANSVERSE B=BODY W=WELD KV=CHARPY V=NOTCH HV=HARDNESS VICKERS (10 KG LOAD) DT=DROP WEIGHT TEAR TEST

ITEM N	N OF PIECES	PRODUCT DIMENSIONS	HEAT N	LOT N	TENSILE TEST Dimensions of specimen width: 1.5;1.5in thickness: 0.353;0.350in length:7.874in type of test piece: W-F,B-E					IMPACT TEST Dimensions of specimen width: 0.295in thickness: 0.394in				STEEL MAKING PROCESS BASIC OXYGENE STEEL			
						Yield strength Re Psi	Tensile strength Rm Psi	Elongation A%	Hydro pressure Psi	Pla- ce and ori- enta- tion	Spe- si- men type	Test temperature, °F percussive viscosity, Ft-lb				OTHER TESTS	
					C01, C02, C10	C11	C12	C13	D02	C01 C02	C40 C30	Impact1 +32°	Impact2 +32°	Impact3 +32°	Average +32°		
B09	B10	B11-13	B08	C00													
1		12.75inODx0.375in 40.0-42.0ft	3051681	32488	W T B T	48.000;42.000	80.000;79.000	42.0;41.0	2100 10secs	BT	KV	21;23	30;24	29;33	27;27	FLATTENING TEST SATISFACTOR WELD LINE 100% US-TESTED UT SIZE 12.75x0.375in N10 RESIDUAL MAGNETIZM 10.0-20.0 GAUSS THE MINIMUM TEMPERATURE FOR HEAT TREATMENT OF THE WELD SEAM 1634°F Hardness Rockwell < 22 HRC Weld repair isn't permitted	

C71-C94 ANALYSIS % LD-LADLE CH-CHECK		C	Si	Mn	P	S	N	Cr	Cu	Al	Ni	Mo	Ti	V	NB	Ca	O	Zr	CEV normal 0.43
Heat N	3051681	LD	0.20	0.27	0.62	0.008	0.004	0.003	0.03	0.06	-	0.03	0.003	-	0.006	-	-	-	-
	3051681	CH	0.20	0.26	0.62	0.011	0.007	-	<0.05	0.044	0.030	0.045	<0.01	<0.01	<0.01	-	-	-	<0.32

TECHNICAL
CONTROL

DEPARTMENT
OF CERTIFICATION

STAMP

D01

SIGNATURE

Бланк серии 2Ж №

18949

Z01/Z02

THESE RESULTS ARE CERTIFIED BY INTERPIPE NMPP AND COMPLY WITH
THE REQUIREMENTS OF THE PRODUCT DESCRIPTION.





INTERPIPE
NMPP

OJSC "INTERPIPE NOVOMOSKOVSK
PIPE PRODUCTION PLANT"
115 SUCHKOV STR.
NOVOMOSKOVSK UKRAINE



INSPECTION CERTIFICATE
EN 10204 / 3.1

A01

Sheet 14 Sheets 14

A02	DATE	09.04.08	201
	CERT. NO	2377/08	203
	DEL. NOTE		209

CUSTOMER

A06



LICENCE №
SL - 0304

INTERPIPE NMPP REF number

SALES

WORKS

Freight. carn

Q-ty of Gross, lb Net, lb
packs weight weight

CUSTOMER ORDER № 08-1162

68461433

-

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A07

PRODUCT DESCRIPTION

Electric welded steel pipes acc to ASTM A53-06/API 5L PSL 2
43-th EDITION 2004 Grade B/X42

801-04

08/A10

L=LONGITUDINAL T=TRANSVERSE B=BODY W=WELD KV=CHARPY V=NOTCH HV=HARDNESS VICKERS (10 KG LOAD) DT=DROP WEIGHT TEAR TEST

ITEM N	N OF PIECES	PRODUCT DIMENSIONS	HEAT N	LOT N	TENSILE TEST Dimensions of specimen width: 1.5;1.5in thickness: 0.350;0.347in length:7.874in type of test piece: W-F,B-E					IMPACT TEST Dimensions of specimen width: 0.295in thickness: 0.394in				STEEL MAKING PROCESS BASIC OXYGENE STEEL			
						Yeld strength Re Psi	Tensile strength Rm Psi	Elongation A%	Hydro pressure Psi	Pla- ce and ori- enta- tion C01 C02	Spe- si- men type C40 C30	Test temperature, °F percussive viscosity, Ft-lb				OTHER TESTS	
					C01, C02, C10	C11	C12	C13	D02			Impact1 +32°	Impact2 +32°	Impact3 +32°	Average +32°		
B09	B10	B11-13	B08	C00													
1		12.75inODx0.375in 40.0-42.0ft	3051601	32406	W T B T	52.000;64.000	94.000;90.000	34.0;36.0	2100 10secs	BT	KV	32;33	32;39	39;41	34;38	FLATTENING TEST SATISFACTOR WELD LINE 100% US-TESTED UT SIZE 12.75x0.375in N10 RESIDUAL MAGNETIZM 10.0-20.0 GAUSS THE MINIMUM TEMPERATURE FOR HEAT TREATMENT OF THE WELD SEAM 1634°F Hardness Rockwell < 22 HRC Weld repair isn't permitted	

C71-C94 ANALYSIS % LD-LADLE CH-CHECK		C	Si	Mn	P	S	N	Cr	Cu	Al	Ni	Mo	Ti	V	NB	Ca	O	Zr	CEV normal 0.43
Heat N	3051601 LD	0.20	0.25	0.55	0.007	0.009	0.003	0.01	0.06	-	0.03	0.003	-	0.003	-	-	-	-	-
	3051601 CH	0.21	0.26	0.54	0.009	0.006	-	<0.05	0.035	0.042	0.034	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.32

THESE RESULTS ARE CERTIFIED BY INTERPIPE NMPP AND COMPLY WITH
THE REQUIREMENTS OF THE PRODUCT DESCRIPTION.

STAMP

D01

[Signature]

TECHNICAL
CONTROL
DEPARTMENT
OF CERTIFICATION

SIGNATURE

[Signature]

Бланк серии 2Ж №

18953

Z01/Z02

TIANJIN SHUANGJIE PIPE MANUFACTURING CO., LTD.,

MILL TEST REPORT

编号 INV08SJZG0049A,0049B,0049C,0049D
NO:日期 2008/7/31
DATE OF ISSUE:订单号码 083-H522 商品名称 E.R.W. STEEL PIPE AND TUBE
P.O MO. COMMODITY:客户名称
CUSTOMER:规格 API 5L B PSL 1/ASTM A53-B/ASME SA53-B 发货人:TIANJIN SHUANGJIE PIPE MANUFACTURING CO., LTD.,
SPECIFICATION: SHIPPER:

ASTM REVISION YEAR: 2002

COUNTRY OF ORIGIN: CHINA

VESSEL NAME: MEDI VALENCIA V.821M

INV NO.	HEAT NO.	TYPE	ORDER SIZE	QUANTITY			REMARK									
				PCS	TTL LENGTH	WEIGHT(M/T)										
0049C	08201440	BBE	20" X 0.375" X 42'	105	4410 FT	157.228	THE NUMBER OF THIS CREDIT. OIP021208000079									
	08301756	BBE	20" X 0.375" X 42'	34	1428 FT	50.912										
	08101777	BBE	20" X 0.375" X 42'	17	714 FT	25.456										
	08301757	BBE	20" X 0.375" X 42'	83	3486 FT	124.285										
	08201443	BBE	20" X 0.375" X 42'	17	714 FT	25.456										
	08101775	BBE	20" X 0.375" X 42'	120	5040 FT	179.689										
INV NO.	HEAT NO.	HYOROSTATIC TEST		N.D.T. —— *2	VISUAL & DIMENSION	FLATTENING	BENDING	ZINC COATING TEST								
		Psi	RESULT					W.T. OF ZINC COATING o.z/ft²								
0049C		783	G	G	G	G										
		783	G	G	G	G										
		783	G	G	G	G										
		783	G	G	G	G										
		783	G	G	G	G										
		783	G	G	G	G										
INV NO.	HEAT NO.	DE SI G *5	CHEMICAL COMPOSITION(%)										TENSILE TEST			
			C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	DI R *7	TENSILE STRENGTH Psi	YIELD STRENGTH Psi	E.L % *8
			2			3		2	2	2	2	3				
0049C		H	14	19	88	19	12	-	-	-	-	-				
		P	14	19	90	18	8	1	1	2	3	3	L	65,975	49,300	43
		H	14	17	101	16	5	-	-	-	-	-				
		P	14	17	103	15	1	2	1	1	3	3	L	65,975	50,750	44
		H	11	19	85	12	5	-	-	-	-	-				
		P	11	19	87	11	1	2	1	3	2	1	L	65,250	48,575	48
		H	17	20	91	6	8	-	-	-	-	-				
		P	17	20	93	5	4	3	3	3	1	2	L	64,525	46,400	48
		H	12	20	102	14	4	-	-	-	-	-				
		P	12	20	104	13	0	2	1	2	1	2	L	64,525	50,750	48
		H	16	19	89	5	9	-	-	-	-	-				
		P	16	19	91	4	5	1	2	3	2	2	L	65,250	47,125	48
NOTE	*REFER TO THE BACK SIDE		OTHER		TIANJIN SHUANGJIE PIPE MANUFACTURING CO., LTD.											
Surveyor:			WE HEREBY CERTIFY THAT THE MATERIAL HEREIN HAS BEEN MADE AND TESTED IN ACCORANCE WITH ABOVE SPECIFICATION AND THE RESULTS OF ALL TEST ARE ACCEPTABLE.										Manager of Q.A Dept 李学良			

SECTION DESIGNATION

ENGLISH

***1** TYPE OF PIPE END

ABS:Asphalt Coating Bell End
 BBE(GBE):Black (Galvanized) Bevel End
 BME(GME):Black (Galvanized) Mitl Cut End
 BSB:Black Square Cut & Bevel End (45°)
 BSC(GSC):Black (Galvanized) Square Cut
 BTC(GTC):Black (Galvanized) Threaded & Coupled
 BRC:Black Bevel End (65°)
 BRG(GRG):Black (Galvanized) Roll Grooving
 BBF(GBF):Black (Galvanized) Bevel End (37.5°)
 BCG(GCG):Black (Galvanized) Cut Grooving
 BBC:Black Square Cut & Bevel End (30°)
 BBN:Black Square Cut & Bevel End (37.5°)

CBS:Coaltar Coating Bell End
 CLB:Coaltar Liquid Bell End
 STC:Short Threaded & Coupled
 STO:Short Threaded (others) & Coupled
 LTC:Long Threaded & Coupled

***2** NON-DESTRUCTIVE TEST

U:Ultrasonic Test
 E:Eddy Current Test
 M:Magnetic Particle Test
 R:Radiographic Test
 E.U:Eddy Current Test & Full Body Ultrasonic Test
 F.U:Full Body Ultrasonic Test
 R.U:Radiographic Test & Ultrasonic Test of Pipe End

***3** BENDING

B:Bend Test
 G:Guided Bend Test
 R:Reverse Bend Test

4** C.S:Copper Sulphate Test5** ALK:Akali Test***6** DESIGNATION

H:Heat [Ladle] Analysis
 P:Product Analysis

***7** CHEMICAL COMPOSITION

2:×100

3:×1000

***8** CARBON EQUIVALENT { ×100 }

$$\begin{aligned}
 &\text{Si} \quad \text{Mn} \quad \text{Cu} \quad \text{Ni} \quad \text{Cr} \quad \text{Mo} \quad \text{V} \\
 \text{C1:C} &+ \frac{\quad}{30} + \frac{\quad}{20} + \frac{\quad}{20} + \frac{\quad}{60} + \frac{\quad}{20} + \frac{\quad}{15} + \frac{\quad}{10} + 5\text{B} \\
 &\text{Mn} \quad \{ \text{Cr} + \text{Mo} + \text{V} \} \quad \{ \text{Ni} + \text{Cu} \} \\
 \text{C2:C} &+ \frac{\quad}{6} + \frac{\quad}{5} + \frac{\quad}{15} \\
 &\text{Mn} \quad \text{Si} \quad \text{Ni} \quad \text{Cr} \quad \text{Mo} \quad \text{V} \\
 \text{C3:C} &+ \frac{\quad}{6} + \frac{\quad}{24} + \frac{\quad}{40} + \frac{\quad}{5} + \frac{\quad}{4} + \frac{\quad}{14}
 \end{aligned}$$

***9** DIRECTION

L: Base Metal Longitudinal
 T: Base Metal Transverse
 W: Weld Part Transverse

10** E.L : Elongation11** HEAT TREATMENT NORMALIZING

S.N: Seam Normalizing
 S.H: SRM Hot Finished
 A.H: Controlled Atmosphere Furnace
 F.N: Full Length Normalizing

G:Good

***12** PROTECTIVE COATING & UNING

P.H: Pin Hole Test



MILL CERTIFICATE

YOUNGQUIST BROTHERS, INC.

Has Received This Shop Drawing/Submitter

YBI/Section No. 02852

Date: 3-24-2010

Signature: [Signature]

COMMODITY: CARBON STEEL PIPE PER SALES CONTRACT
NO. SEUSFP6C02TD3 DATED DECEMBER 11, 2006.
CUSTOMER: OZONE INDUSTRIES CORPORATION
15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CERTIFICATE NO: PSCN/N6C01TC5
DATE OF ISSUE: 4/29/2007

Invoice No. SEUSFP6C02TD3
LC NUMBER.: 5279996

The CARBON STEEL PIPES are tested according to ASTM A139 GR.B
This is to certify that in accordance with the relevant specifications and contracts.

The CARBON STEEL PIPES manufactured were tested and qualified by our Quality Control Department.

TOTAL : 746 PCS / 29840FT / 1769.619MT

Pipes No.	Heat Numbers	Steel	Size			Quantity			Dimensional	TESTING RESULTS										Flattening	UT Test
			O.D.	W.T.	Length					CHEMICAL PROPERTIES(%)					PHYSICAL PROPERTIES			Welding properties	Hydrostatic Test Holding time:10s		
		Grade	in	in	ft	Pcs	ft	MT	Inspection	C	SI	Mn	P	S	σs(Mpa)	σb(Mpa)	δ5(%)	σb	P = Psi	Test (B)	Test (B)
45	012206	B	28	0.375	40	3	120	6.028	OK	0.14	0.17	0.35	0.011	0.026	310	420	31.5	OK	500	OK	OK
46	008304	B	28	0.375	40	4	160	8.038	OK	0.19	0.27	0.46	0.014	0.030	295	425	31.5	OK	500	OK	OK
47	008502	B	28	0.375	40	3	120	6.028	OK	0.16	0.20	0.40	0.014	0.028	300	425	31.5	OK	500	OK	OK
48	011905	B	28	0.375	40	4	160	8.038	OK	0.17	0.22	0.44	0.011	0.032	305	435	31	OK	500	OK	OK
49	010502	B	28	0.375	40	3	120	6.028	OK	0.15	0.16	0.34	0.013	0.029	305	425	31.5	OK	500	OK	OK
50	016606	B	28	0.375	40	4	160	8.038	OK	0.19	0.25	0.46	0.014	0.033	295	425	32	OK	500	OK	OK
51	012603	B	28	0.375	40	3	120	6.028	OK	0.17	0.18	0.40	0.009	0.030	310	420	32.5	OK	500	OK	OK
52	016206	B	28	0.375	40	1	40	2.009	OK	0.18	0.23	0.42	0.010	0.031	315	420	31.5	OK	500	OK	OK
53	088206	B	30	0.375	40	3	120	6.465	OK	0.18	0.23	0.49	0.014	0.033	315	430	33	OK	500	OK	OK
54	047303	B	30	0.375	40	3	120	6.465	OK	0.19	0.27	0.42	0.010	0.032	300	425	31	OK	500	OK	OK
55	047304	B	30	0.375	40	3	120	6.465	OK	0.15	0.19	0.45	0.016	0.029	310	420	32	OK	500	OK	OK
56	055202	B	30	0.375	40	3	120	6.465	OK	0.18	0.23	0.47	0.011	0.031	315	430	33	OK	500	OK	OK
57	053802	B	30	0.375	40	4	160	8.618	OK	0.15	0.19	0.45	0.009	0.030	310	420	32	OK	500	OK	OK
58	049502	B	30	0.375	40	3	120	6.465	OK	0.14	0.17	0.35	0.010	0.028	305	425	33	OK	500	OK	OK
59	052407	B	30	0.375	40	3	120	6.465	OK	0.15	0.16	0.46	0.012	0.029	310	420	32.5	OK	500	OK	OK
60	049902	B	30	0.375	40	3	120	6.465	OK	0.19	0.25	0.50	0.012	0.028	325	440	33	OK	500	OK	OK
61	053804	B	30	0.375	40	4	160	8.619	OK	0.16	0.22	0.44	0.013	0.031	305	425	31	OK	500	OK	OK
62	053801	B	30	0.375	40	3	120	6.465	OK	0.17	0.26	0.36	0.015	0.030	295	425	32	OK	500	OK	OK
63	053608	B	30	0.375	40	3	120	6.465	OK	0.17	0.21	0.42	0.010	0.030	295	425	30.5	OK	500	OK	OK
64	054104	B	30	0.375	40	3	120	6.465	OK	0.18	0.24	0.47	0.013	0.032	320	435	32.5	OK	500	OK	OK
65	054002	B	30	0.375	40	4	160	8.619	OK	0.18	0.24	0.47	0.013	0.032	320	435	32.5	OK	500	OK	OK
66	055602	B	30	0.375	40	3	120	6.465	OK	0.17	0.24	0.43	0.010	0.029	300	420	30.5	OK	500	OK	OK

YOUNGQUIST BROTHERS, INC.
Has Received Shop Drawing/Submittal
YBI/Section No: 02852
Date: 3-24-2010
Signature: *[Signature]*



MILL CERTIFICATE

COMMODITY: CARBON STEEL PIPE PER SALES CONTRACT
NO. SEUSFP6C02TD3 DATED DECEMBER 11, 2006.
CUSTOMER: OZONE INDUSTRIES CORPORATION
15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CERTIFICATE NO: PSCNIN6C01TCS
DATE OF ISSUE: 4/29/2007

Invoice No. SEUSFP6C02TD3
LC NUMBER: 5279996

The CARBON STEEL PIPES are tested according to ASTM A139 GR.B
This is to certify that in accordance with the relevant specifications and contracts.

The CARBON STEEL PIPES manufactured were tested and qualified by our Quality Control Department.

TOTAL : 746 PCS / 29840FT / 1769.619MT

Pipes No.	Heat Numbers	Steel	Size			Quantity			Dimensional	TESTING RESULTS										Flattening	UT Test
			O.D.	W.T.	Length					CHEMICAL PROPERTIES(%)					PHYSICAL PROPERTIES			Welding properties	Hydrostatic Test Holding time:10s		
		Grade	in	in	ft	Pcs	ft	MT	Inspection	C	SI	Mn	P	S	σs(Mpa)	σb(Mpa)	δ5(%)	σb	P = Psi	Test (B)	Test (B)
52	016206	B	28	0.375	40	1	40	2.009	OK	0.18	0.23	0.42	0.010	0.031	315	420	31.5	OK	500	OK	OK
53	088206	B	30	0.375	40	3	120	6.465	OK	0.18	0.23	0.49	0.014	0.033	315	430	33	OK	500	OK	OK
54	047303	B	30	0.375	40	3	120	6.465	OK	0.19	0.27	0.42	0.010	0.032	300	425	31	OK	500	OK	OK
55	047304	B	30	0.375	40	3	120	6.465	OK	0.15	0.19	0.45	0.016	0.029	310	420	32	OK	500	OK	OK
56	055202	B	30	0.375	40	3	120	6.465	OK	0.18	0.23	0.47	0.011	0.031	315	430	33	OK	500	OK	OK
57	053802	B	30	0.375	40	4	160	8.618	OK	0.15	0.19	0.45	0.009	0.030	310	420	32	OK	500	OK	OK
58	049502	B	30	0.375	40	3	120	6.465	OK	0.14	0.17	0.35	0.010	0.028	305	425	33	OK	500	OK	OK
59	052407	B	30	0.375	40	3	120	6.465	OK	0.15	0.18	0.46	0.012	0.029	310	420	32.5	OK	500	OK	OK
60	049802	B	30	0.375	40	3	120	6.465	OK	0.19	0.25	0.50	0.012	0.028	325	440	33	OK	500	OK	OK
61	053004	B	30	0.375	40	4	160	8.619	OK	0.18	0.22	0.44	0.013	0.031	305	425	31	OK	500	OK	OK
62	053801	B	30	0.375	40	3	120	6.465	OK	0.17	0.26	0.36	0.015	0.030	295	425	32	OK	500	OK	OK
63	053605	B	30	0.375	40	3	120	6.465	OK	0.17	0.21	0.42	0.010	0.030	295	425	30.5	OK	500	OK	OK
64	054104	B	30	0.375	40	3	120	6.485	OK	0.18	0.24	0.47	0.013	0.032	320	435	32.5	OK	500	OK	OK
65	054002	B	30	0.375	40	4	160	8.619	OK	0.18	0.24	0.47	0.013	0.032	320	435	32.5	OK	500	OK	OK
66	055602	B	30	0.375	40	3	120	6.485	OK	0.17	0.24	0.43	0.010	0.029	300	420	30.5	OK	500	OK	OK
67	084704	B	30	0.375	40	3	120	6.465	OK	0.16	0.18	0.39	0.011	0.029	315	435	31	OK	500	OK	OK
68	048503	B	30	0.375	40	3	120	6.465	OK	0.18	0.28	0.45	0.017	0.033	315	425	31.5	OK	500	OK	OK

YIEH CORPORATION LIMITED

[Signature]

06/29/2007 10:07

6155750

YIEH CORP

PAGE 04/15



MILL CERTIFICATE

YOUNGQUIST BROTHERS, INC.
Has Received This Shop Drawing/Submital
YBI/Section No: 02852
Date: 3-24-2010
Signature: *[Signature]*

COMMODITY: CARBON STEEL PIPES AS PER ASTM A139 GR.B SPIRAL WELDED, NORMAL MILL BLACK LACQUER FOR RUST PROTECTION, ONE END OF THE PIPE SHALL HAVE A BEVEL OF 30 DEGREES WITH A TOLERANCE PLUS FIVE, MINUS ZERO DEGREES. THE OTHER END OF THE PIPE WILL BE PLAIN, RIGHT AND ANGLE CUT. ALL BURRS REMOVED.

CERTIFICATE NO: PSCNUN7601TC5

DATE OF ISSUE: 9/13/2007

CUSTOMER: OZONE INDUSTRIES CORPORATION
15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

The CARBON STEEL PIPES are tested according to ASTM A139 GR.B
This is to certify that in accordance with the relevant specifications and contracts.

Invoice No. SEUSFP7601TD3

LC NUMBER: 64405427

The CARBON STEEL PIPES manufactured were tested and qualified by our Quality Control Department.

TOTAL : 112 PCS / 4368 FT / 330.631 MT

Pipes No.	Heat Numbers	Steel	Size			Quantity			Dimensional	TESTING RESULTS											Flattening	UT Test
			O.D.	W.T.	Length					CHEMICAL PROPERTIES(%)					PHYSICAL PROPERTIES			Welding properties	Hydrostatic Test Holding time:10s			
		Grade	in	in	ft	Pcs	ft	MT	Inspection	C	Si	Mn	P	S	σs(Mpa)	σb(Mpa)	δ5(%)	σb	P = Psi	Test (B)	Test (B)	
1	1-9160	B	52	0.375	39	14	546	51.258	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK	
2	1-9161	B	50	0.375	39	14	546	49.272	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK	
3	1-9161	B	48	0.375	39	14	546	47.286	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK	
4	1-9161	B	42	0.375	39	28	1092	82.658	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	505	OK	OK	
5	1-9160	B	36	0.375	39	28	1092	70.743	OK	0.16	0.19	0.48	0.029	0.029	330	460	30	OK	505	OK	OK	
6	1-9161	B	30	0.375	39	14	546	29.414	OK	0.17	0.19	0.47	0.030	0.038	325	455	33	OK	522	OK	OK	
TOTAL						112	4368	330.631														

YIEH CORPORATION LIMITED

[Signature]

Appendix G

IW-1

SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 1 (11/1/09-11/8/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 11/05/09 TIME 1005-1130

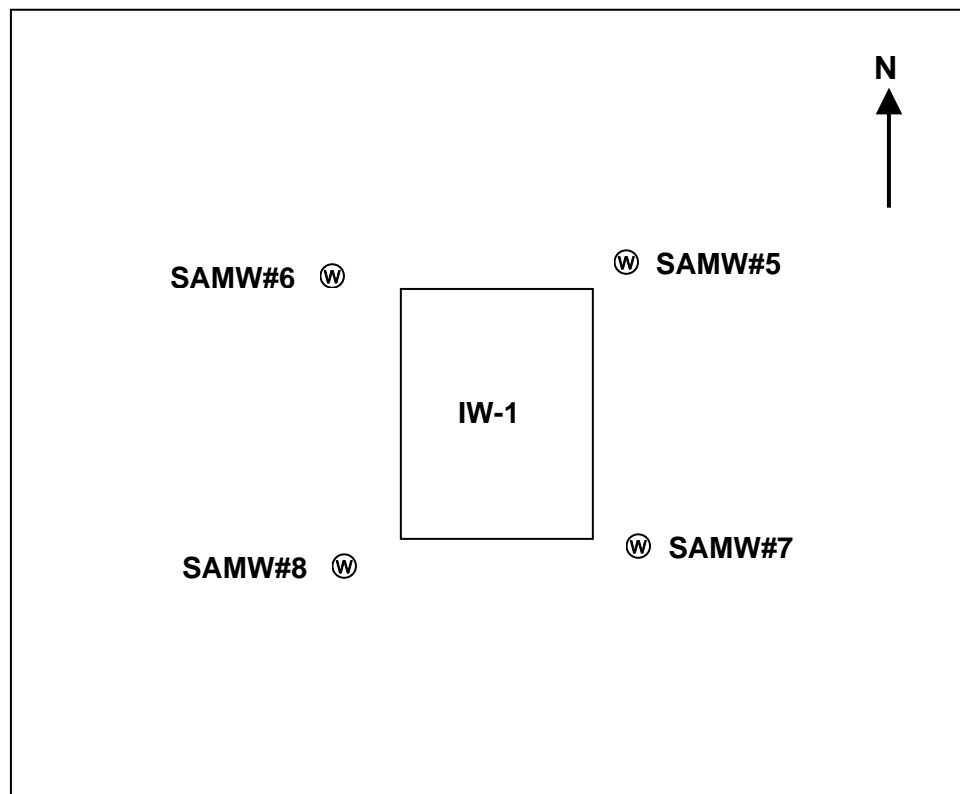
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	**	**	**	**
DEPTH TO WATER (TOC*)	4.60	3.62	5.92	6.79
WATER LEVEL (NAVD 88)				
CHLORIDE (mg/l)	82.8	163	56.8	46.7
CONDUCTIVITY (µmhos/cm)	928	1348	971	963
TOTAL DISOLV. SOLIDS (mg/l)	696	932	720	764
TEMPERATURE (C)	26.5	26.2	26.9	27.0

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 2 (11/13/09-11/20/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 11/13/09 TIME 0955-1110

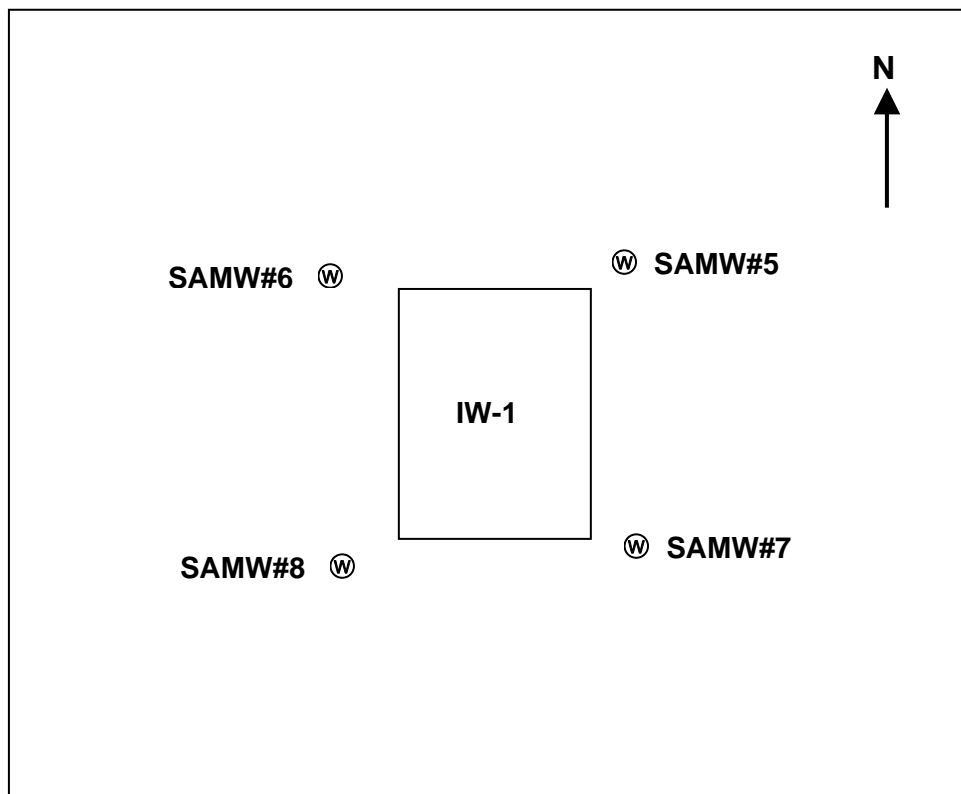
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	**	**	**	**
DEPTH TO WATER (TOC*)	4.62	3.61	5.94	6.78
WATER LEVEL (NAVD 88)				
CHLORIDE (mg/l)	74.2	143	57.2	48.2
CONDUCTIVITY (µmhos/cm)	907	1250	956	947
TOTAL DISOLV. SOLIDS (mg/l)	710	930	730	720
TEMPERATURE (C)	25.7	25.6	26.6	26.4

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 3 (11/20/09-11/27/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 11/18/09 TIME 0945-1100

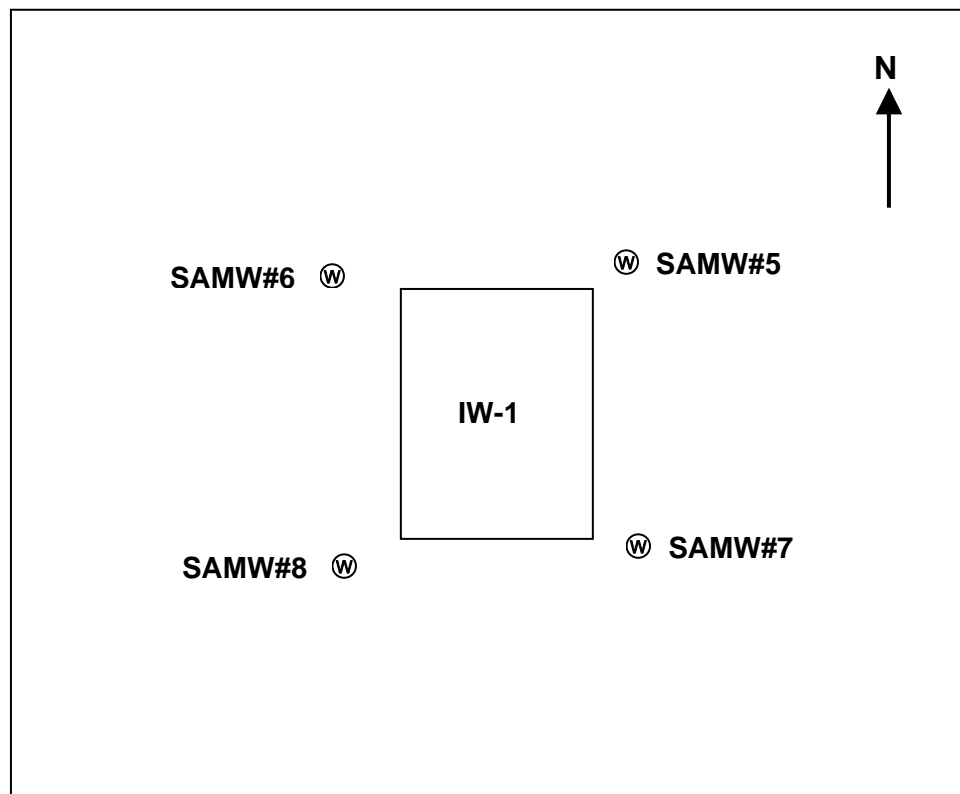
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.61	3.71	5.97	6.80
WATER LEVEL (NAVD 88)	0.87	0.73	0.83	0.83
CHLORIDE (mg/l)	80	78	70	56
CONDUCTIVITY (µmhos/cm)	901	1194	957	938
TOTAL DISOLV. SOLIDS (mg/l)	692	880	730	700
TEMPERATURE (C)	25.7	25.9	26.8	26.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 4 (11/27/09-12/04/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 11/27/09 TIME 0945-1526

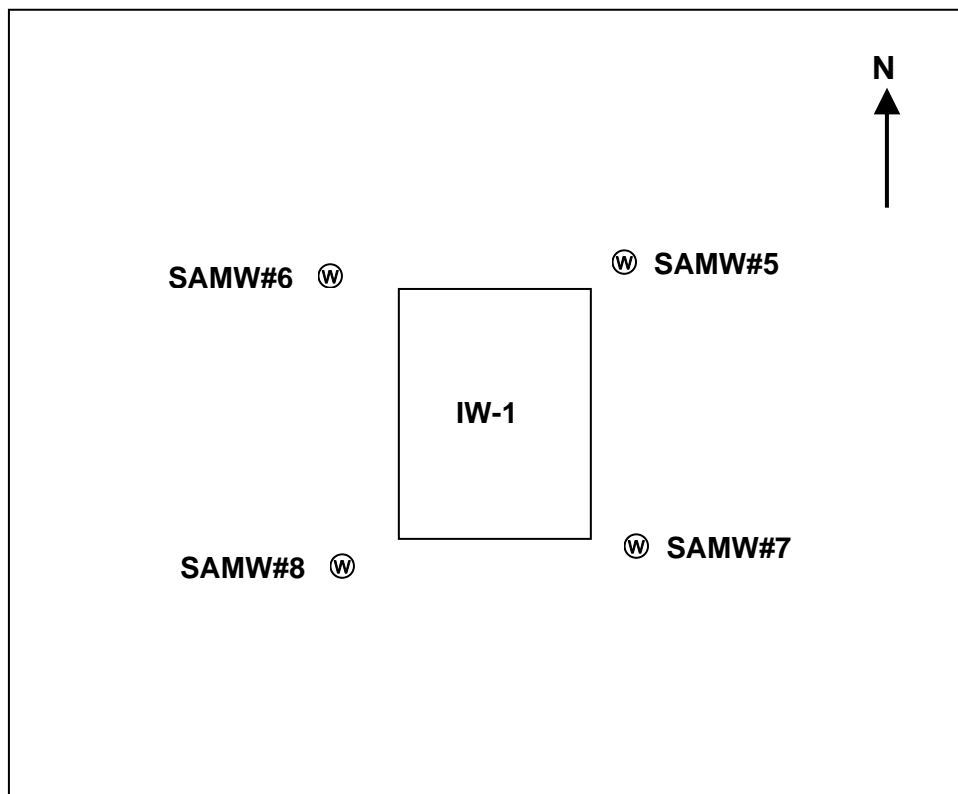
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.12	3.12	5.45	6.25
WATER LEVEL (NAVD 88)	1.36	1.32	1.35	1.38
CHLORIDE (mg/l)	80	256	70	64
CONDUCTIVITY (µmhos/cm)	909	1564	1041	949
TOTAL DISOLV. SOLIDS (mg/l)	708	1068	840	756
TEMPERATURE (C)	25.1	24.7	26.2	26.0

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 5 (12/04/09-12/11/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 12/04/09 TIME 1045-1203

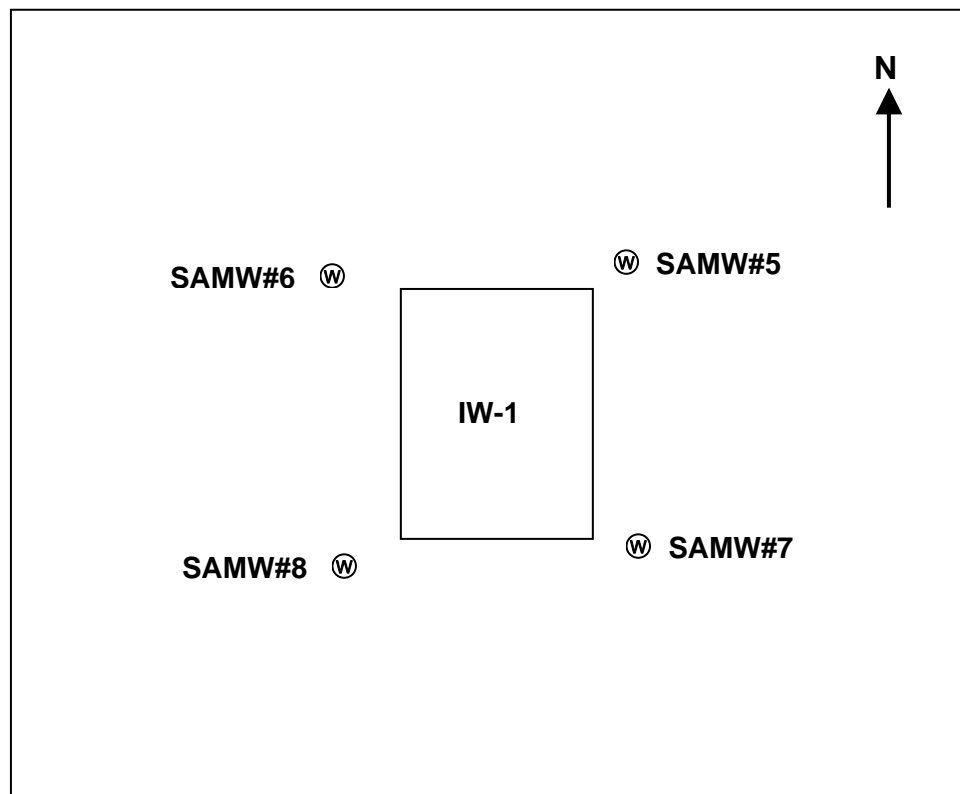
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.50	3.45	5.80	6.62
WATER LEVEL (NAVD 88)	0.98	0.99	1.00	1.01
CHLORIDE (mg/l)	76.0	234	70.0	58.0
CONDUCTIVITY (µmhos/cm)	1060	1691	1136	1079
TOTAL DISOLV. SOLIDS (mg/l)	700	1068	768	744
TEMPERATURE (C)	25.1	24.9	26.3	26.5

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 6 (12/11/09-12/18/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 12/09/09 TIME 0815-0935

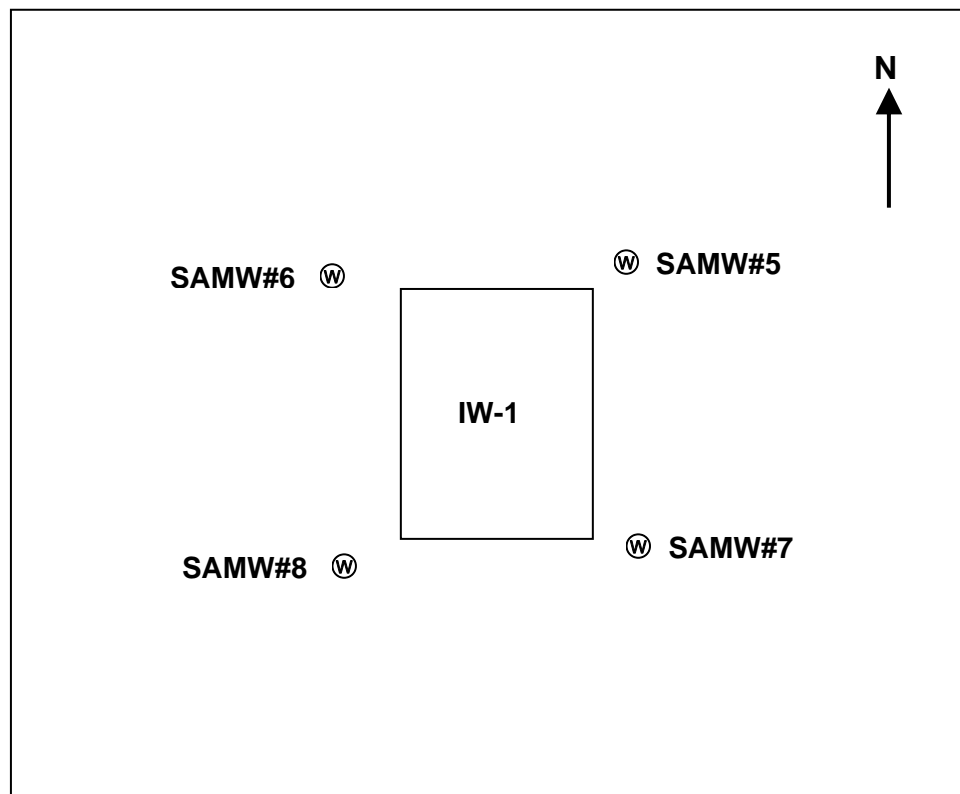
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.50	3.50	5.85	6.38
WATER LEVEL (NAVD 88)	0.98	0.94	0.95	1.25
CHLORIDE (mg/l)	88.0	200	84.0	64.0
CONDUCTIVITY (µmhos/cm)	1065	1579	1323	1084
TOTAL DISOLV. SOLIDS (mg/l)	714	960	842	756
TEMPERATURE (C)	25.0	25.3	26.5	26.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 7 (12/18/09-12/25/09)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 12/18/09 TIME 1230-1309

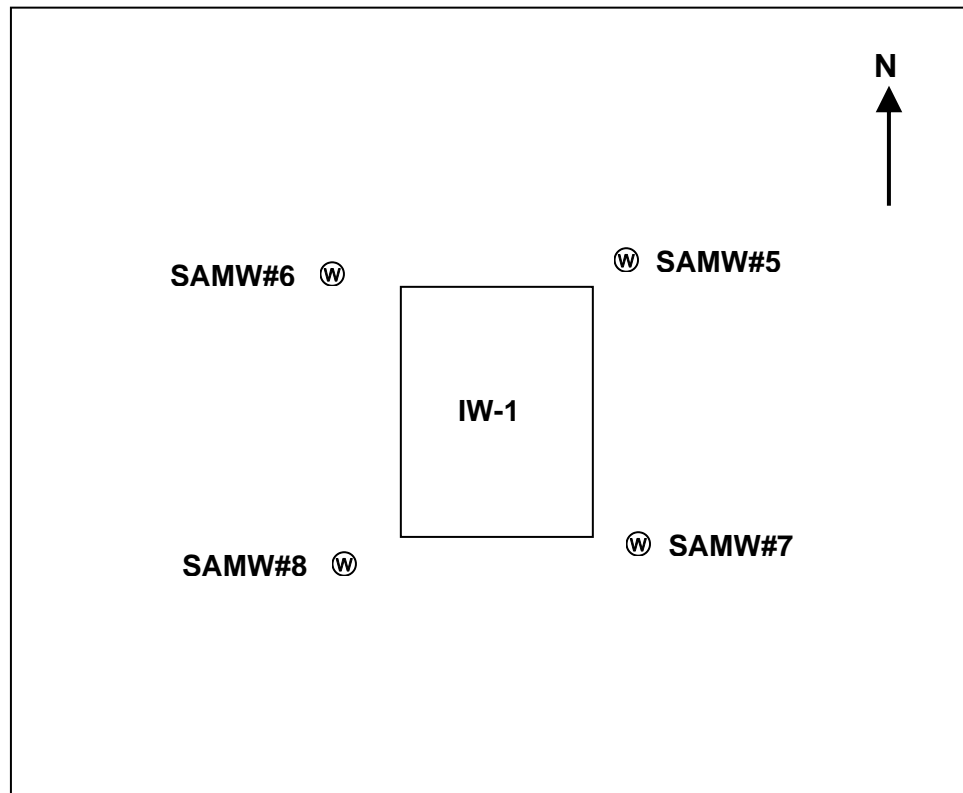
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.11	3.10	5.25	6.15
WATER LEVEL (NAVD 88)	1.37	1.34	1.55	1.48
CHLORIDE (mg/l)	80.0	170	292	144
CONDUCTIVITY (µmhos/cm)	1034	1310	1836	1325
TEMPERATURE (C)	25.4	25.5	26.7	27.1

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 8 (12/25/09-1/01/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 12/22/09 TIME 0955-1120

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.38	3.41	5.71	6.52
WATER LEVEL (NAVD 88)	1.10	1.03	1.09	1.11
CHLORIDE (mg/l)	94.0	196	220	78.0
CONDUCTIVITY (µmhos/cm)	1154	1720	1741	1107
TEMPERATURE (C)	24.4	24.2	25.7	26.2

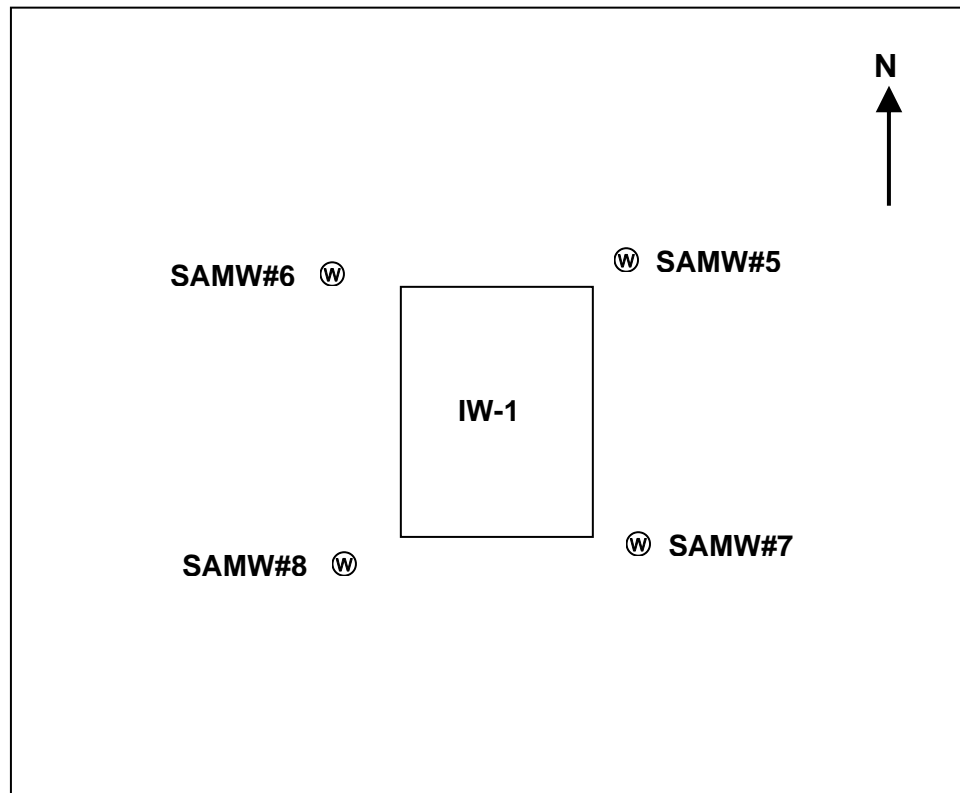
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 9 (1/01/10-1/8/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 12/28/09 TIME 0825-1125

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.56	3.55	5.91	6.72
WATER LEVEL (NAVD 88)	0.92	0.89	0.89	0.91
CHLORIDE (mg/l)	88.0	178	196	68.0
CONDUCTIVITY (µmhos/cm)	1150	1510	1676	1199
TEMPERATURE (C)	23.5	23.8	26.2	25.9

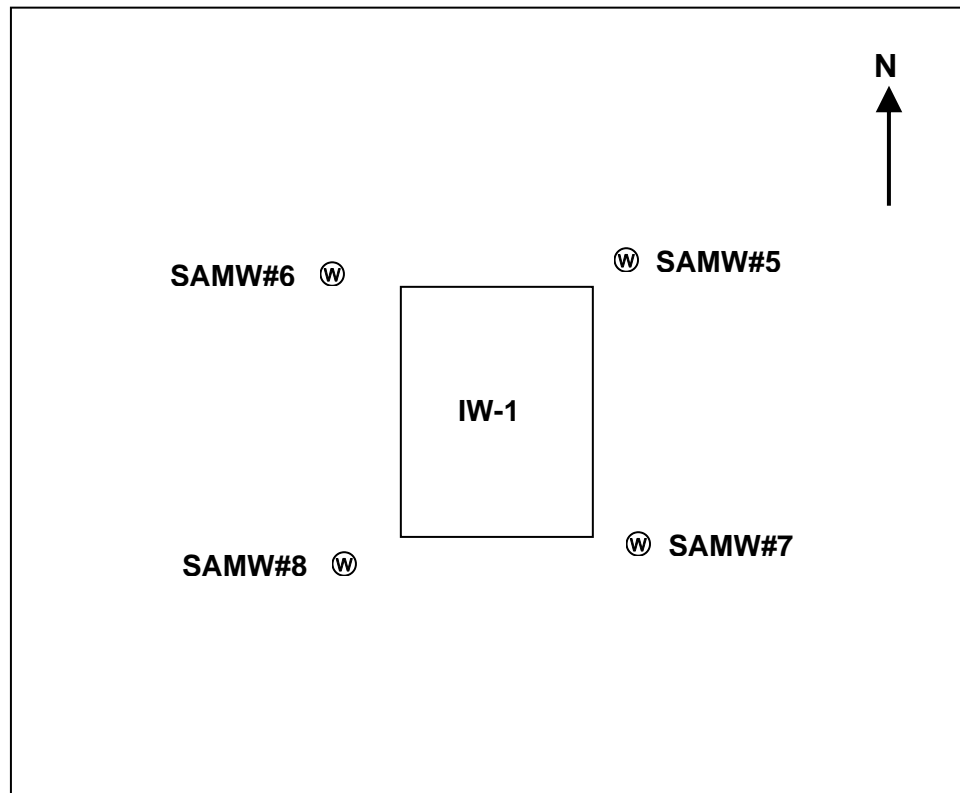
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 10 (1/08/10-1/15/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 1/8/10 TIME 0945-1115

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.75	3.72	6.05	6.88
WATER LEVEL (NAVD 88)	0.73	0.72	0.75	0.75
CHLORIDE (mg/l)	80.0	217	240	64.0
CONDUCTIVITY (µmhos/cm)	993	1514	1721	1003
TEMPERATURE (C)	22.7	23.7	25.6	25.9

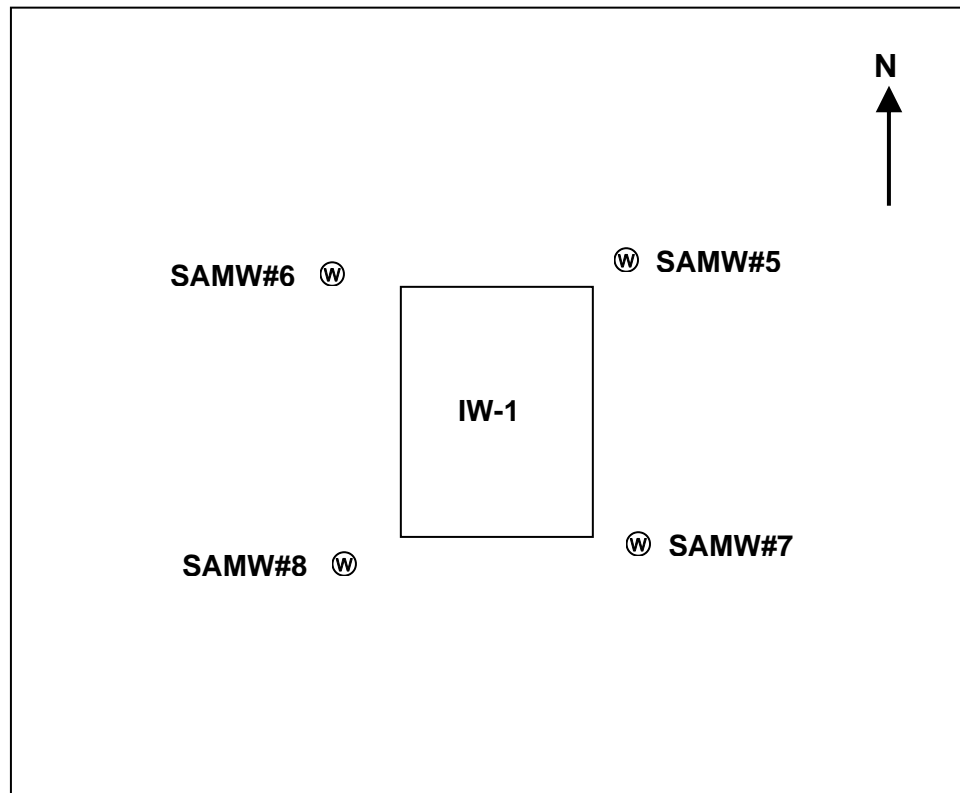
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 11 (1/15/10-1/22/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 1/15/10 TIME 0905-1034

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.87	3.85	6.21	7.02
WATER LEVEL (NAVD 88)	0.61	0.59	0.59	0.61
CHLORIDE (mg/l)	78.5	231	216	56.2
CONDUCTIVITY (µmhos/cm)	1075	1657	1711	1047
TEMPERATURE (C)	22.6	23.1	25.4	25.6

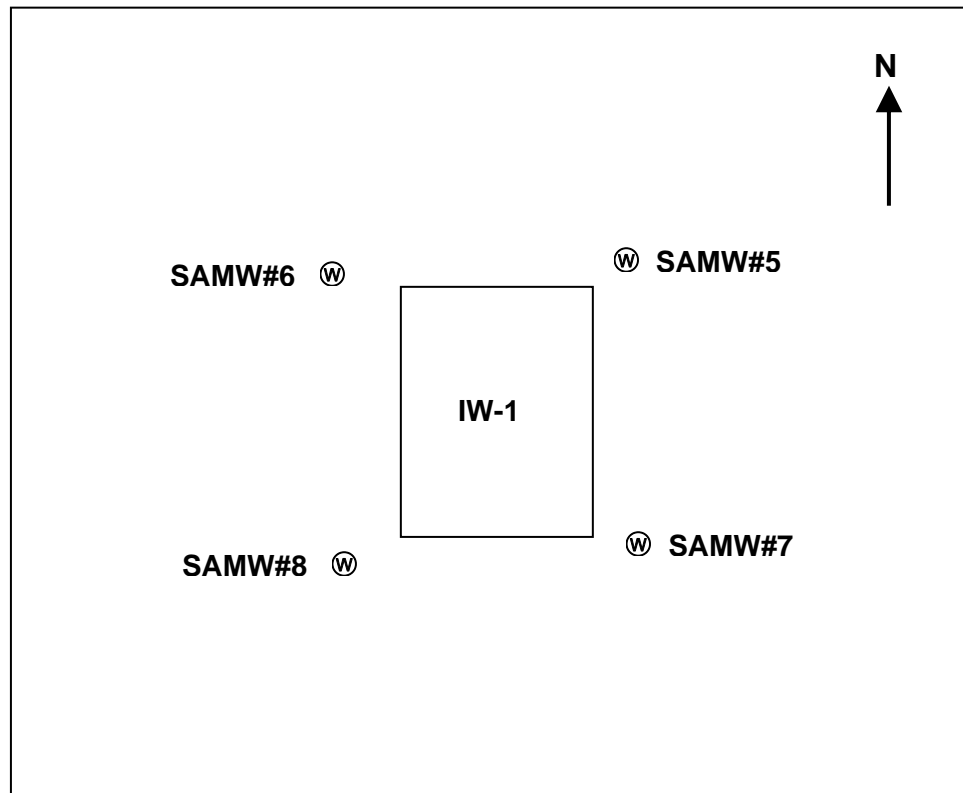
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 12 (1/22/10-1/29/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 1/18/10 TIME 1105-1225

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.75	3.71	6.05	6.89
WATER LEVEL (NAVD 88)	0.73	0.73	0.75	0.74
CHLORIDE (mg/l)	126	200	130	66.0
CONDUCTIVITY (µmhos/cm)	1206	1383	1380	1033
TEMPERATURE (C)	22.2	22.7	25.5	25.3

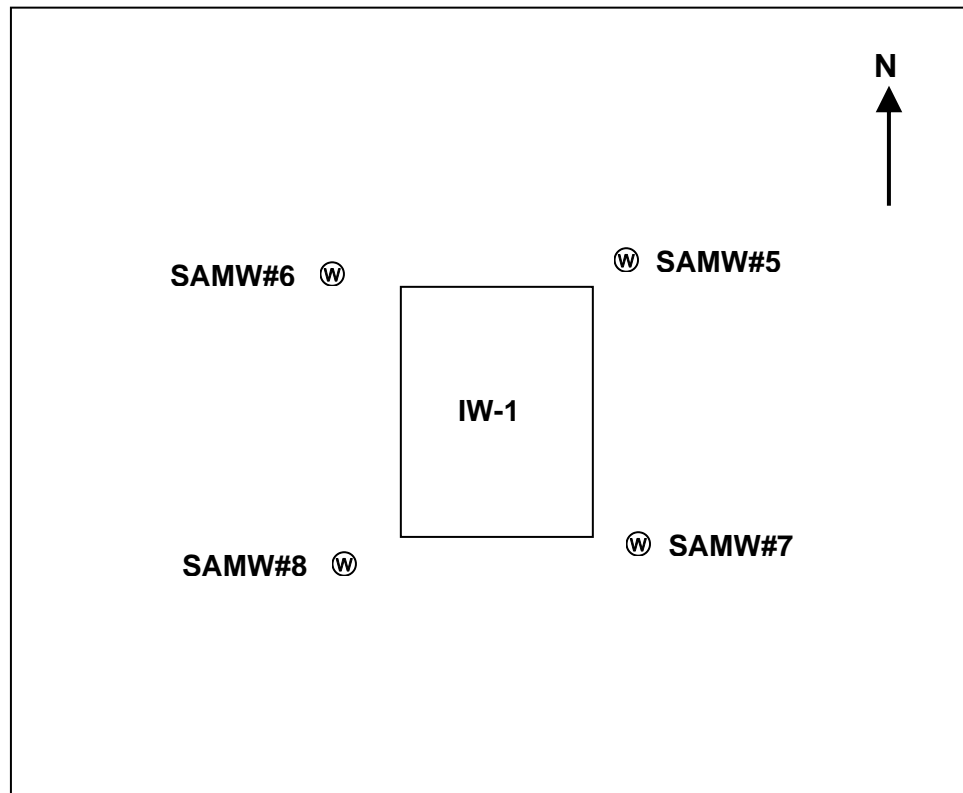
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 13 (1/29/10-2/5/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 1/28/10 TIME 1015-1129

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.76	3.72	6.08	6.90
WATER LEVEL (NAVD 88)	0.72	0.72	0.72	0.73
CHLORIDE (mg/l)	94.0	182	96.0	66.0
CONDUCTIVITY (µmhos/cm)	1080	1286	1156	1021
TEMPERATURE (C)	22.6	22.8	25.4	25.7

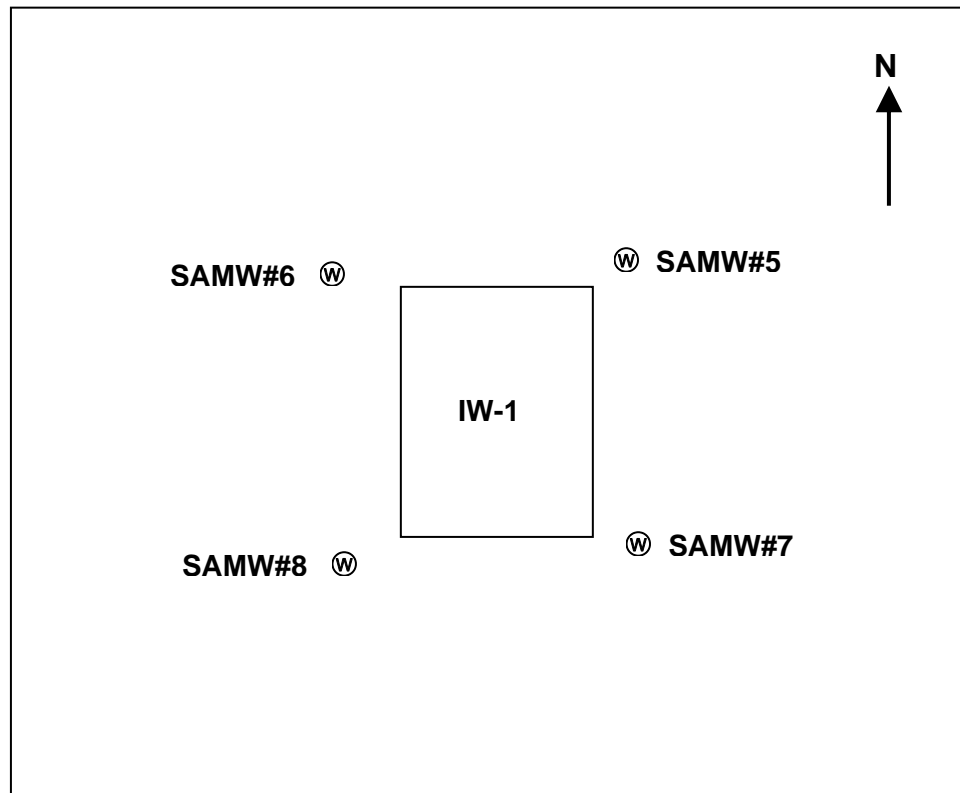
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 14 (2/5/10-2/12/10)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 2/5/10 TIME 1003-1128

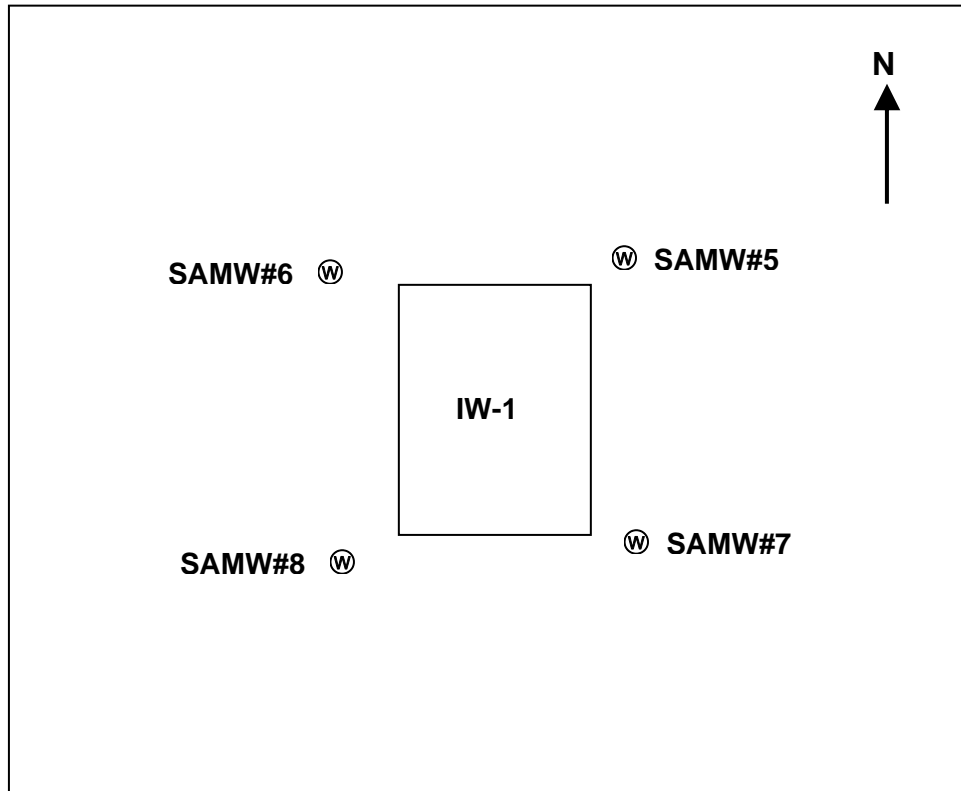
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.00	3.00	5.35	6.17
WATER LEVEL (NAVD 88)	1.48	1.44	1.45	1.46
CHLORIDE (mg/l)	150	210	186	180
CONDUCTIVITY (µmhos/cm)	1217	1430	1460	1450
TEMPERATURE (C)	23.6	23.2	25.6	26.1

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 15 (2/12/10-2/19/10)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 2/11/10 TIME 1045-1305

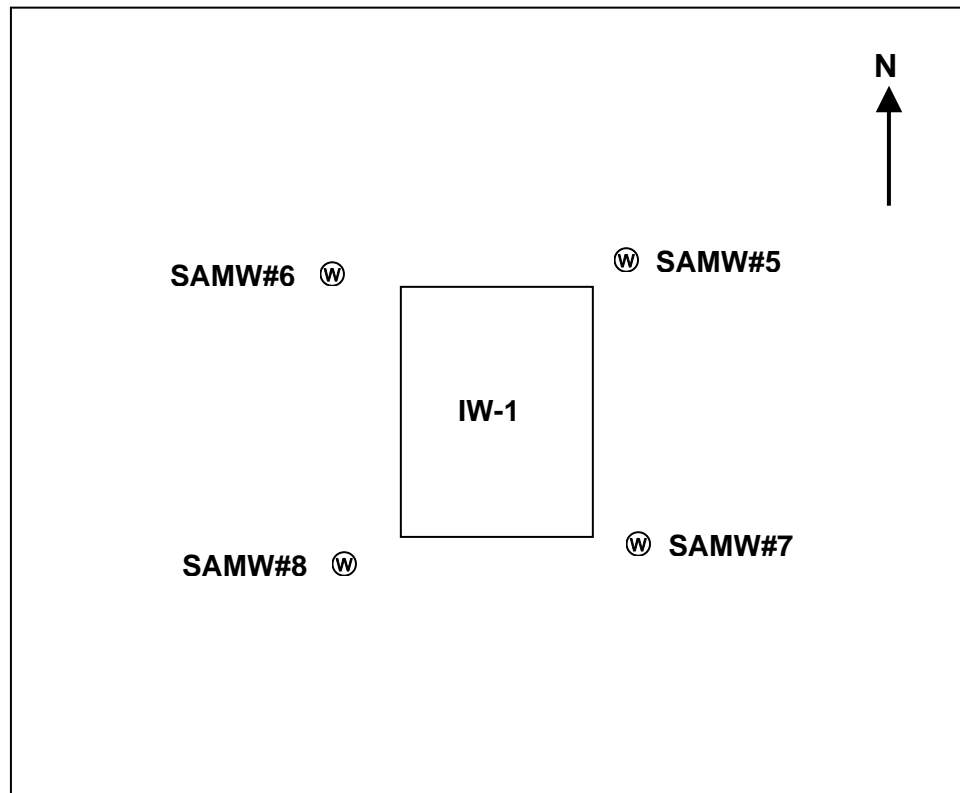
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.43	3.40	5.75	6.57
WATER LEVEL (NAVD 88)	1.05	1.00	1.05	1.06
CHLORIDE (mg/l)	150	230	314	94.0
CONDUCTIVITY (µmhos/cm)	1252	1531	1656	1106
TEMPERATURE (C)	22.0	22.1	24.3	24.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 16 (2/19/10-2/25/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 2/19/10 TIME 0935-1145

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.75	3.80	6.08	6.90
WATER LEVEL (NAVD 88)	0.73	0.64	0.72	0.73
CHLORIDE (mg/l)	96.0	212	96.0	84.0
CONDUCTIVITY (µmhos/cm)	1076	1439	1160	1078
TEMPERATURE (C)	22.0	22.3	24.8	25.1

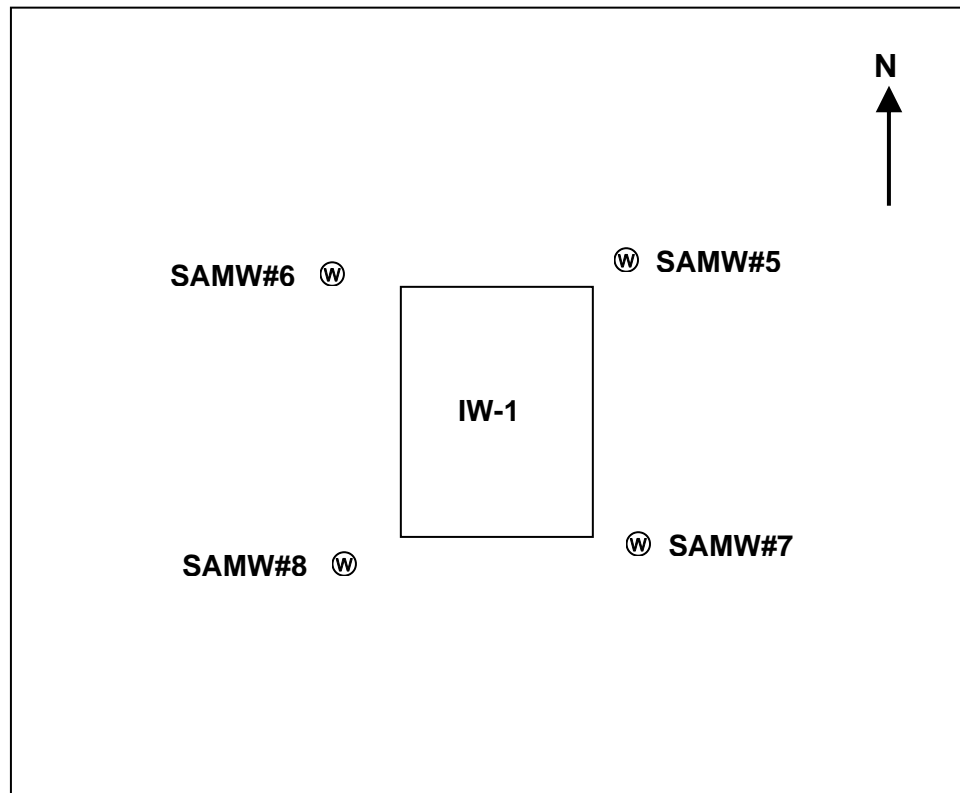
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 17 (2/26/10-3/5/10)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 2/26/10 TIME 1135-1305

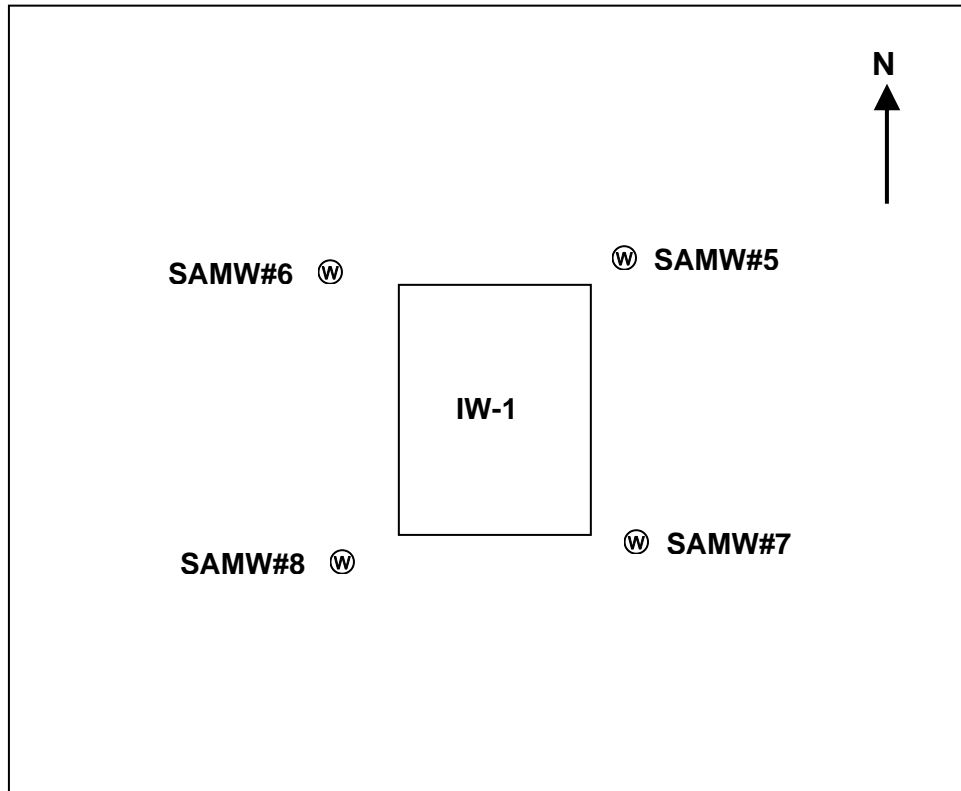
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.60	3.76	5.95	6.74
WATER LEVEL (NAVD 88)	0.88	0.68	0.85	0.89
CHLORIDE (mg/l)	100	202	94.0	78.0
CONDUCTIVITY (µmhos/cm)	1088	1424	1196	1090
TEMPERATURE (C)	22.2	22.4	25.0	24.4

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 18 (3/5/10 – 3/12/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 3/5/10 TIME 1132-1305

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.63	3.62	5.96	6.79
WATER LEVEL (NAVD 88)	0.85	0.82	0.84	0.84
CHLORIDE (mg/l)	90.0	228	72.0	80.0
CONDUCTIVITY (µmhos/cm)	1060	1580	1004	1092
TEMPERATURE (C)	22.1	22.0	20.8	25.2

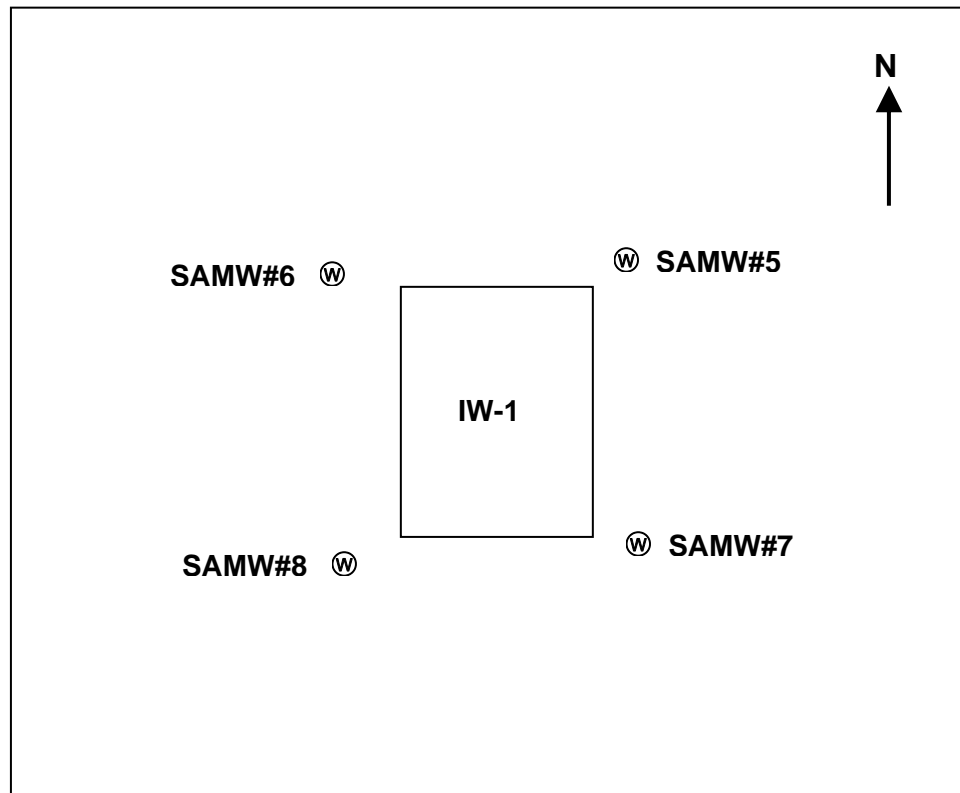
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 19 (3/12/10 – 3/19/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 3/12/10 TIME 1015-1130

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.70	3.62	6.03	6.85
WATER LEVEL (NAVD 88)	0.78	0.82	0.77	0.78
CHLORIDE (mg/l)	84.0	228	98.0	70.0
CONDUCTIVITY (µmhos/cm)	1050	1513	1208	994
TEMPERATURE (C)	22.1	22.0	24.4	25.8

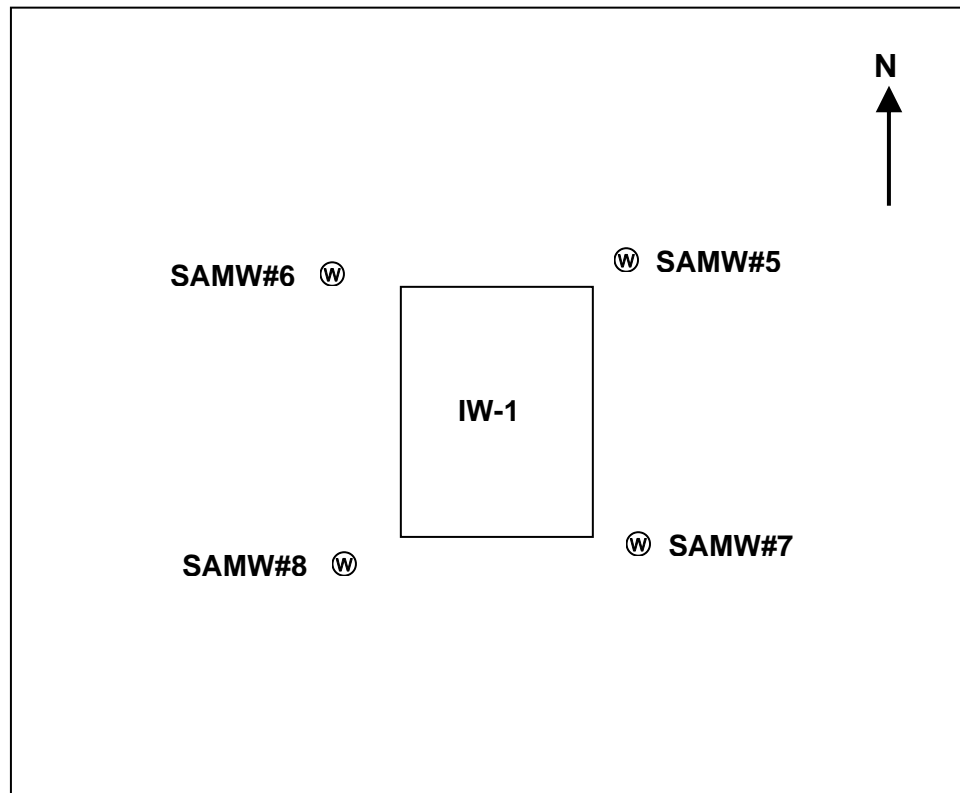
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 20 (3/19/10 – 3/26/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 3/19/10 TIME 0925-1054

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.82	3.80	6.15	6.95
WATER LEVEL (NAVD 88)	0.66	0.64	0.65	0.68
CHLORIDE (mg/l)	96.0	294	172	80.0
CONDUCTIVITY (µmhos/cm)	1100	1698	1399	1080
TEMPERATURE (C)	22.2	21.8	24.1	24.7

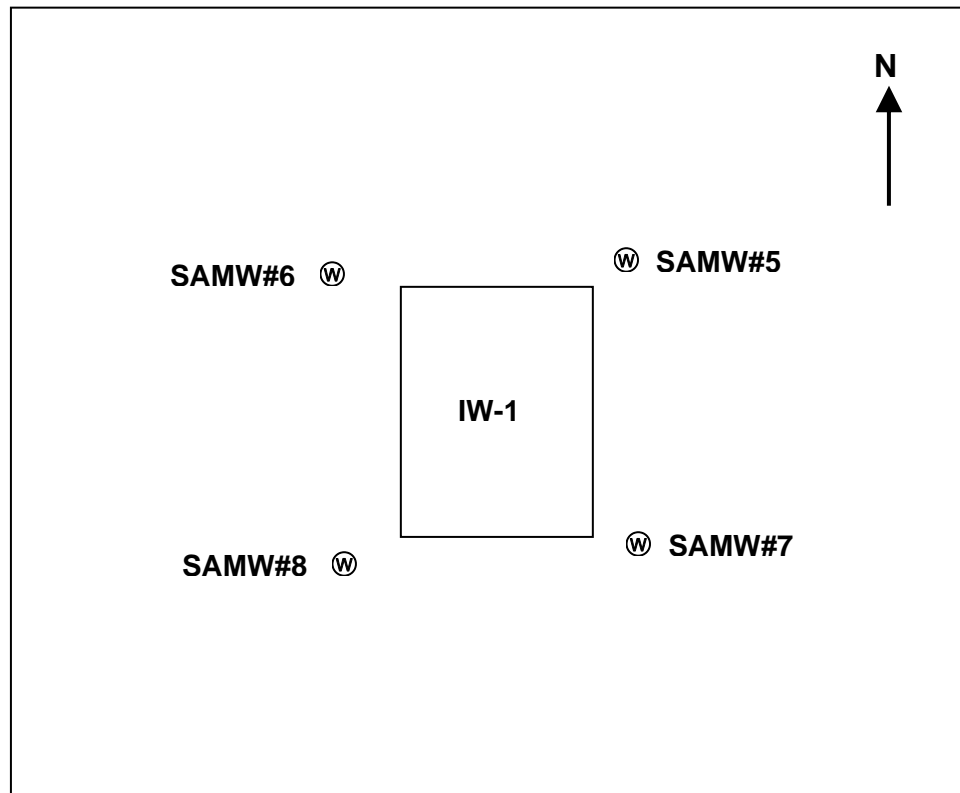
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 21 (3/26/10 – 4/2/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 3/26/10 TIME 1045-1205

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	4.28	3.23	5.58	6.42
WATER LEVEL (NAVD 88)	1.2	1.21	1.22	1.21
CHLORIDE (mg/l)	122	324	338	96.0
CONDUCTIVITY (µmhos/cm)	1223	1823	1146	1726
TEMPERATURE (C)	22.8	22.3	25.1	24.8

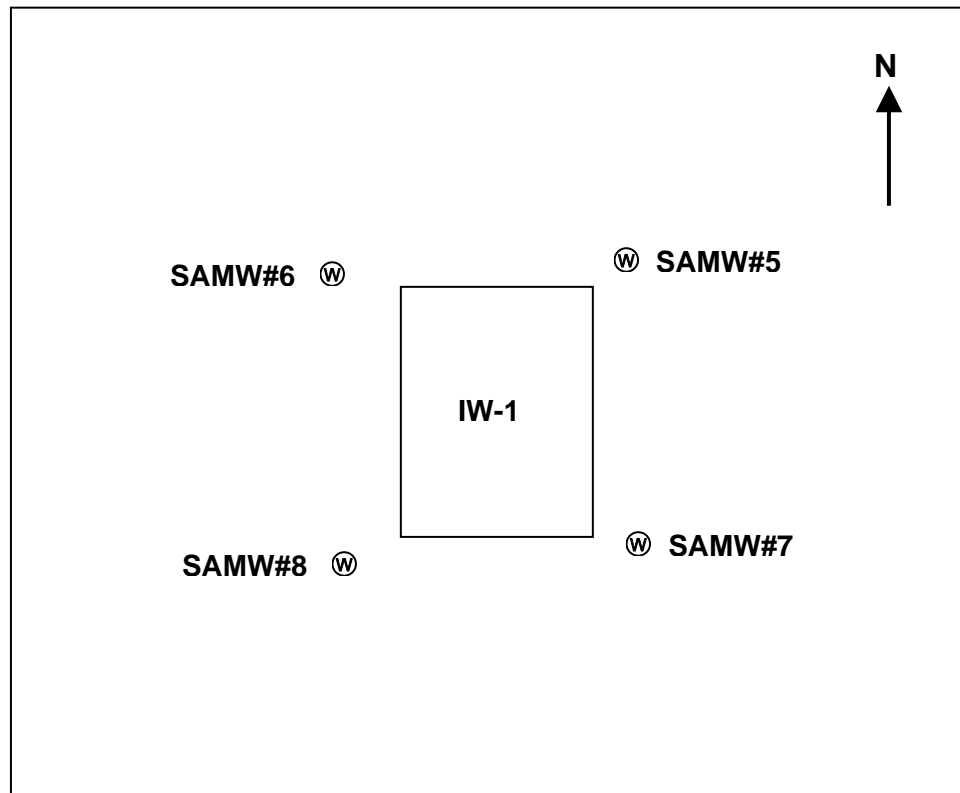
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 22 (4/2/10-4/9/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 4/2/10 TIME 1245-1405

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	5.48	4.44	6.80	7.63
DEPTH TO WATER (TOC*)	2.65	3.05	4.80	6.72
WATER LEVEL (NAVD 88)	2.83	1.39	2.0	0.91
CHLORIDE (mg/l)	128	228	222	98.0
CONDUCTIVITY (µmhos/cm)	899	1438	1371	997
TEMPERATURE (C)	23.1	22.9	25.0	25.4

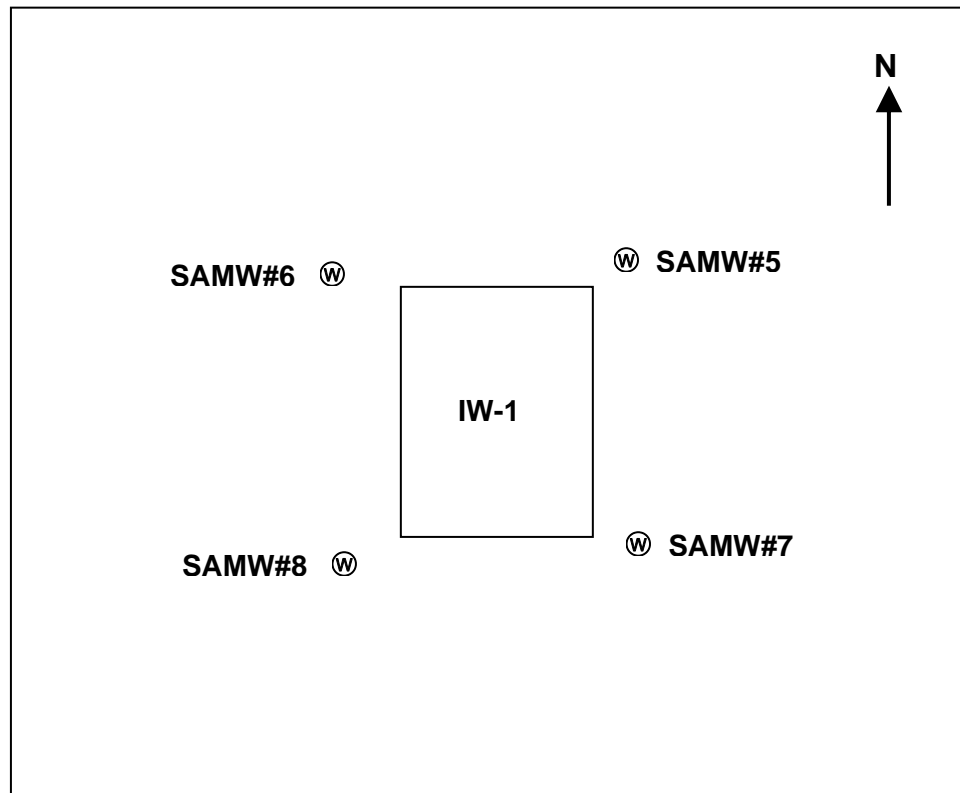
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 23 (4/9/10-4/16/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 4/9/10 TIME 1130-1201

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.89	3.15	4.56	6.79
WATER LEVEL (NAVD 88)	0.59	0.83	1.29	0.84
CHLORIDE (mg/l)	102	250	140	90.0
CONDUCTIVITY (µmhos/cm)	1046	1397	1025	1163
TEMPERATURE (C)	23.8	23.3	26.2	25.8

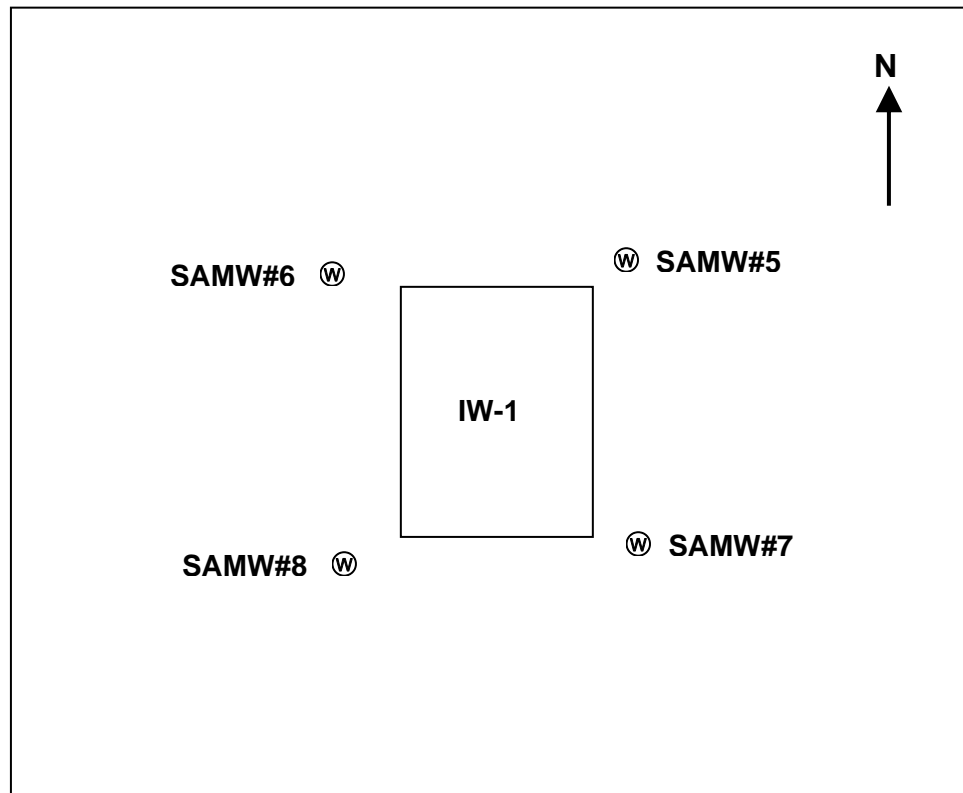
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 24 (4/16/10-4/23/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 4/16 /10 TIME 1115-1235

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.78	3.18	4.77	6.96
WATER LEVEL (NAVD 88)	0.70	0.80	1.08	0.67
CHLORIDE (mg/l)	110	226	174	90.0
CONDUCTIVITY (µmhos/cm)	463	1234	1301	920
TEMPERATURE (C)	23.4	23.2	25.1	25.5

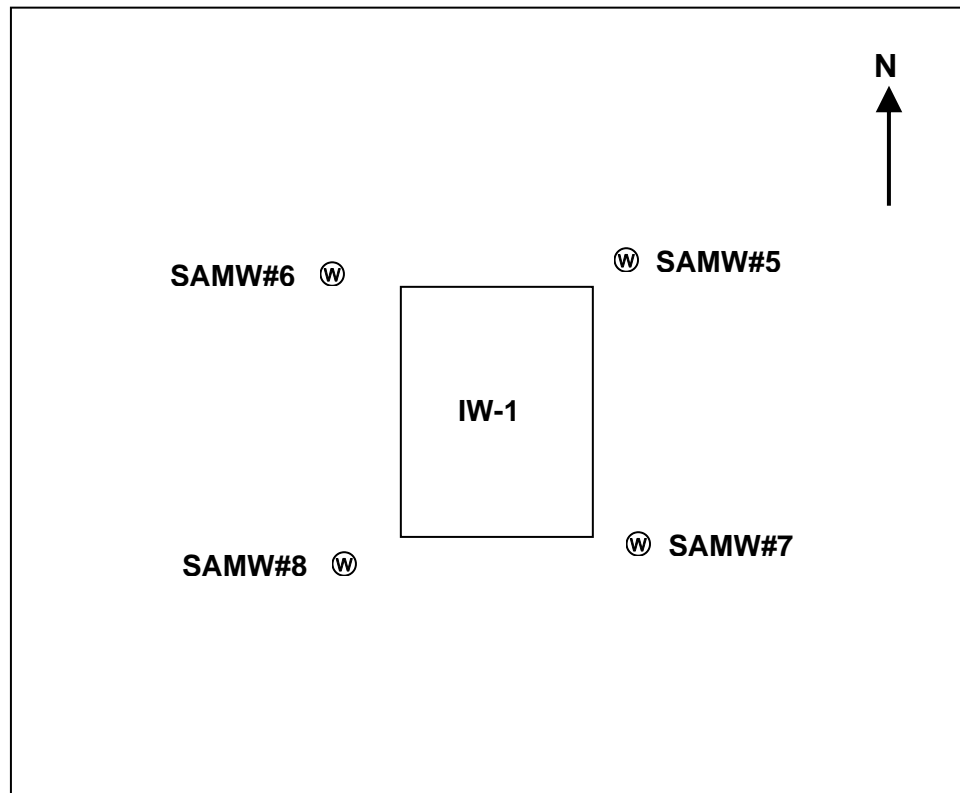
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 25 (4/23/10-4/30/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 4/23 /10 TIME 1115-1250

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.45	2.83	4.63	6.60
WATER LEVEL (NAVD 88)	1.03	1.15	1.22	1.03
CHLORIDE (mg/l)	144	334	690	248
CONDUCTIVITY (µmhos/cm)	951	1469	1950	1296
TEMPERATURE (C)	24.0	24.1	25.0	25.4

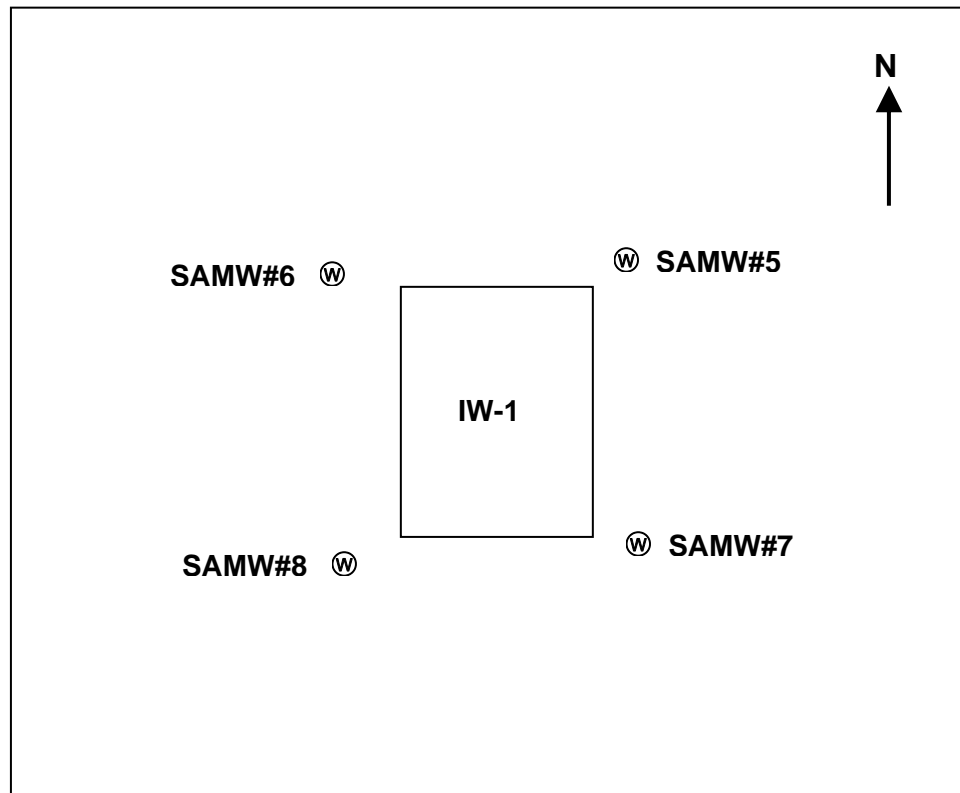
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 26 (4/30/10-5/7/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 4/30 /10 TIME 1111-1141

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	3.68	2.43	4.61	6.65
WATER LEVEL (NAVD 88)	-0.20	1.55	1.24	0.98
CHLORIDE (mg/l)	408	300	244	204
CONDUCTIVITY (µmhos/cm)	1325	961	1517	1217
TEMPERATURE (C)	24.0	24.3	25.9	26.2

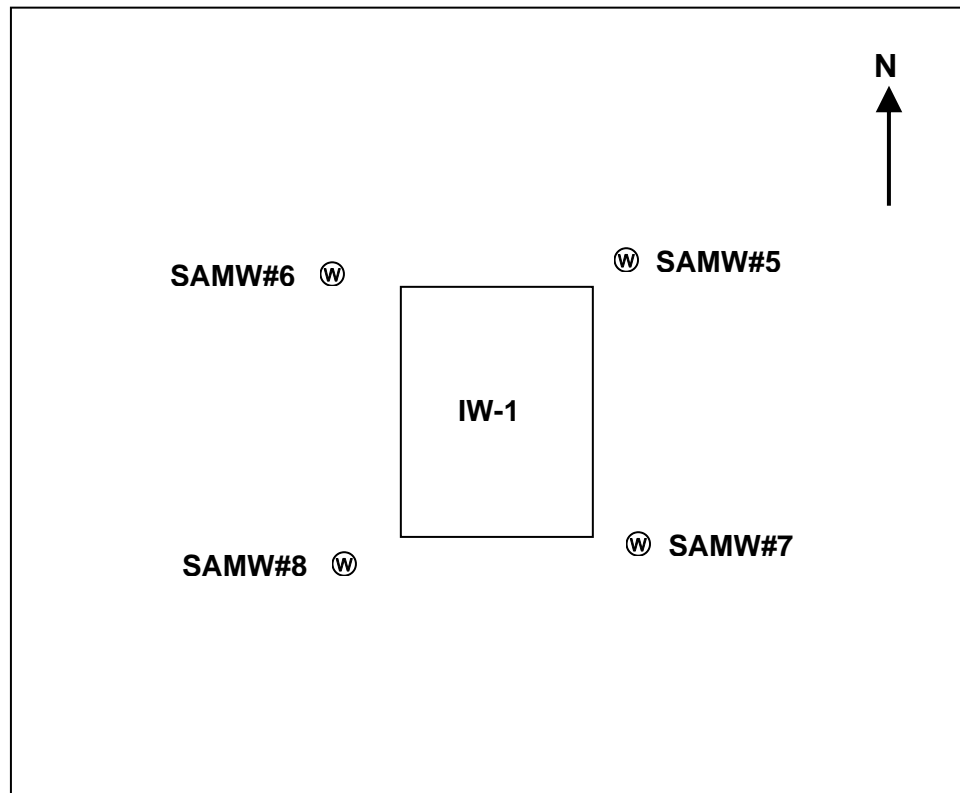
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 27 (5/7/10-5/14/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 5/7/10 TIME 1015-1144

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.85	3.25	5.0	7.0
WATER LEVEL (NAVD 88)	0.63	0.73	0.85	0.63
CHLORIDE (mg/l)	128	256	206	112
CONDUCTIVITY (µmhos/cm)	989	1439	1383	1013
TEMPERATURE (C)	24.2	24.3	25.6	25.8

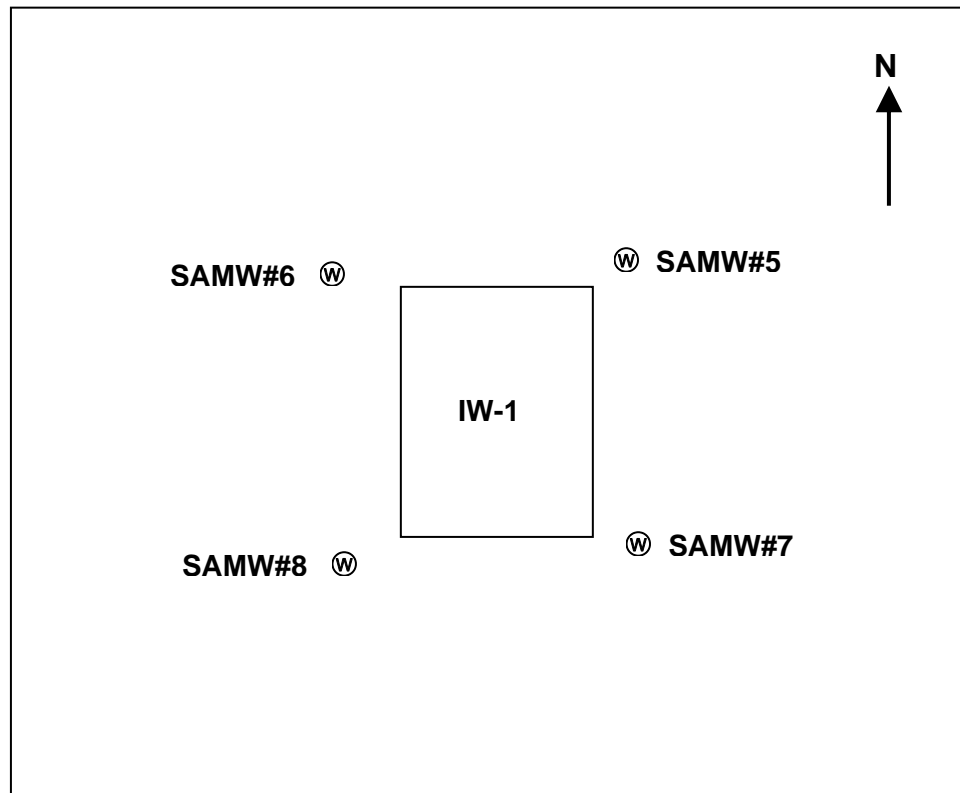
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 28 (5/14/10-5/21/10)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 5/13 /10 TIME 1415-1545

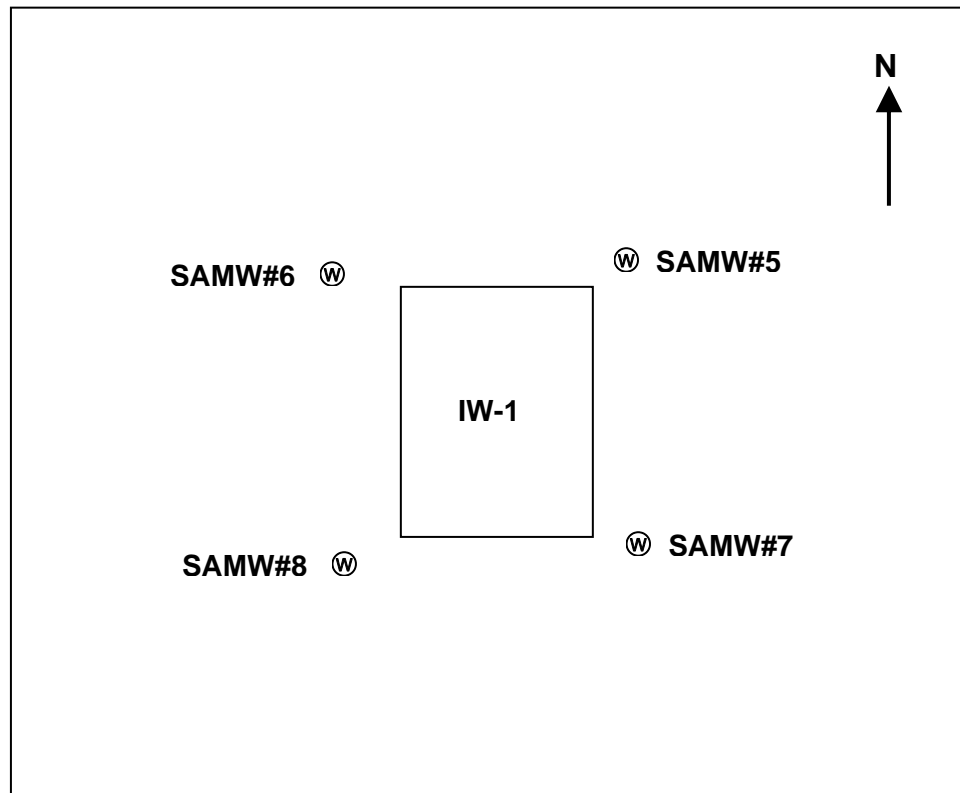
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.80	3.35	5.12	7.05
WATER LEVEL (NAVD 88)	0.68	0.63	0.73	0.58
CHLORIDE (mg/l)	124	230	150	102
CONDUCTIVITY (µmhos/cm)	1012	1342	1254	1011
TEMPERATURE (C)	24.9	24.6	25.9	26.3

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



FORM 0124
Rev. 11/90

WELL PERMIT NO. _____
SFWMD WATER USE PERMIT NO. _____

Rev. 11/90

City of Ft. Lauderdale 11500 NW 9th St Ft. Lauderdale FL 33309

Owner _____ Address _____ City _____ State _____ Zip _____

Contractor's Signature _____ License No. _____ Completion Date _____ Casing Depth _____ Total Depth _____ Well# (5)

TYPE OF WORK: Construct () Repair () Abandon ()
WELL USE: Domestic Well () Public () Monitor () Test ()
Irrigation () Fire Well () Other _____
METHOD: Rotary with MUD () or Air (), Cable Tool (), Jet ()
Casing Driven (), Other Aug. Dr.
STATIC WATER LEVEL 3.5 Ft. below top of casing Surface
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____
From top of ground _____

Located Near _____

County Dade

SE NW 10 S2S 40E
1/4 1/4 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
(☒) No

Note: PWS Wells attach a site map if well location is different from site location on permit application.

	X		

LOCATE IN SECTION

[illegible]

Casing: Black Steel () Galv. () PVC (X) Fiberglass ()

Screen: Type 716 Slot size 1.5
Screened from 1.5 (ft.) to 1.5 (ft.)

Type of grout with % additives. NEA

Water: Clear ☒ Colored () Sulphur () Salty () Iron ()

Conductivity _____ Chlorides _____ mg/l

FORM 0124
Rev. 11/90

WELL PERMIT NO. _____
SFWMD WATER USE PERMIT NO. _____

Rev. 11/90

City of Miami 16500 SW 72nd Ave. Miami, FL 33010				
Owner	Address	City	State	Zip
Contractor's Signature	License No.	Completion Date	Casing Depth	Total Depth

(6.)

TYPE OF WORK: Construct () Repair () Abandon ()
WELL USE: Domestic Well () Public () Monitor () Test ()
Irrigation () Fire Well () Other Fire Well
METHOD: Rotary with MUD () or Air () Cable Tool () Jet ()
Casing Driven () Other _____
STATIC WATER LEVEL 3.5 Ft. below top of casing Surface
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____

Located Near _____

County Dade

SE NW 1, 525 40E
1/4 1/4 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
(X) No

Note: PWS Wells attach a site map if well location is different from site location on permit application.

	X		

LOCATE IN SECTION

[illegible]

Casing: Black Steel () Galv. () PVC (X) Fiberglass ()

Screen: Type PVC Slot size 10
Screened from 1.5 (ft.) to 11.5 (ft.)

Type of grout with % additives Neat

Water: Clear (☒) Colored (☐) Sulphur (☐) Salty (☐) Iron (☐)

Conductivity _____ Chlorides _____ mg/l

FORM 0124
Rev. 11/90

Rev. 11/90

City of Hiialeah	16500 NW 93 th Ave	Hiialeah FL	33010
Owner	Address	City	State Zip
Contractor's Signature	License No.	Completion Date	Casing Depth
			Total Depth
			Well #

Core	Casing & Section	Depth (ft)		DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size and type of material. Note caved, depth to producing zones.
Thickness & Depth	Outside or Depth	From	To	
2"	2"	0		Debris, Trace mud Limestone, cap rock,
6"	1.5			
	2"			
			11.5	
Number of Logs	11.5			

LOCATE IN SECTION

FORM 0124
Rev. 11/95

Rev. 11/93

City of Hialeah 16500 NW 97th Ave Hialeah FL 33010

Owner: [Signature] Address: SWD 11244 City: 1.5 State: 11.5 Zip: 8

Contractor's Signature: [Signature] License No.: [Blank] Completion Date: [Blank] Using Code: [Blank] Rate Code: [Blank] Well #: [Blank]

Core #	Core No. & Section	Depth (ft)	Notes
Thickens & Deep	Thickens & Deep	0	DEBRIS CUTTINGS LOG Examine cuttings every 25 ft or at formation changes Show color, grain, size, and type of material Mark each 25' depth with a red pencil
2"	2"	0	
6"	6"	1.5	Debris, Much Limestone cap rock
2"	2"	11.5	
2"	2"	11.5	

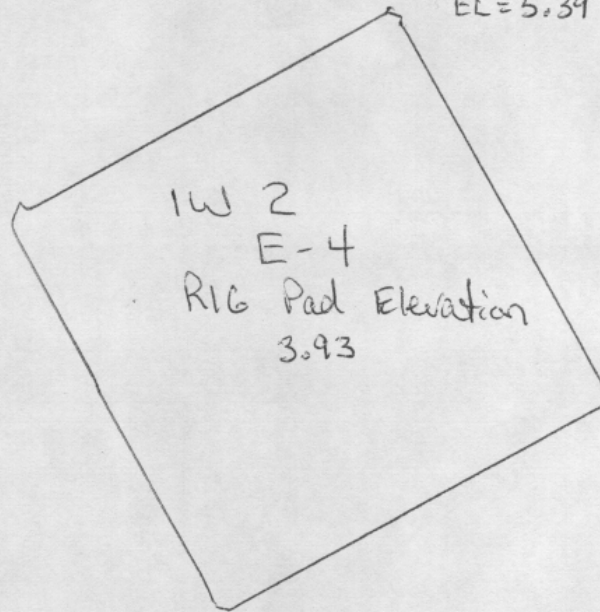
	X		

LOCATED IN SECTION

N ↑

#1
⊗
EL = 4.63

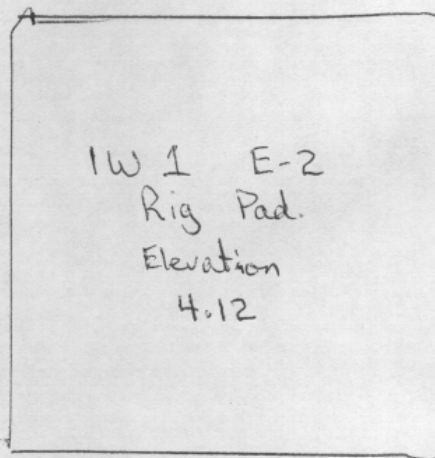
#2
⊗
EL = 5.39



#3
⊗
EL = 4.55

#4
⊗
EL = 4.67

#5
⊗
EL = 5.48



#6
⊗
EL = 4.44

#8
⊗
EL 7.63

#7
⊗
EL = 6.80

All Elevations in NAVD 88

SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Sample Date 5-21-10
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 5/21/10 TIME 0835-0935

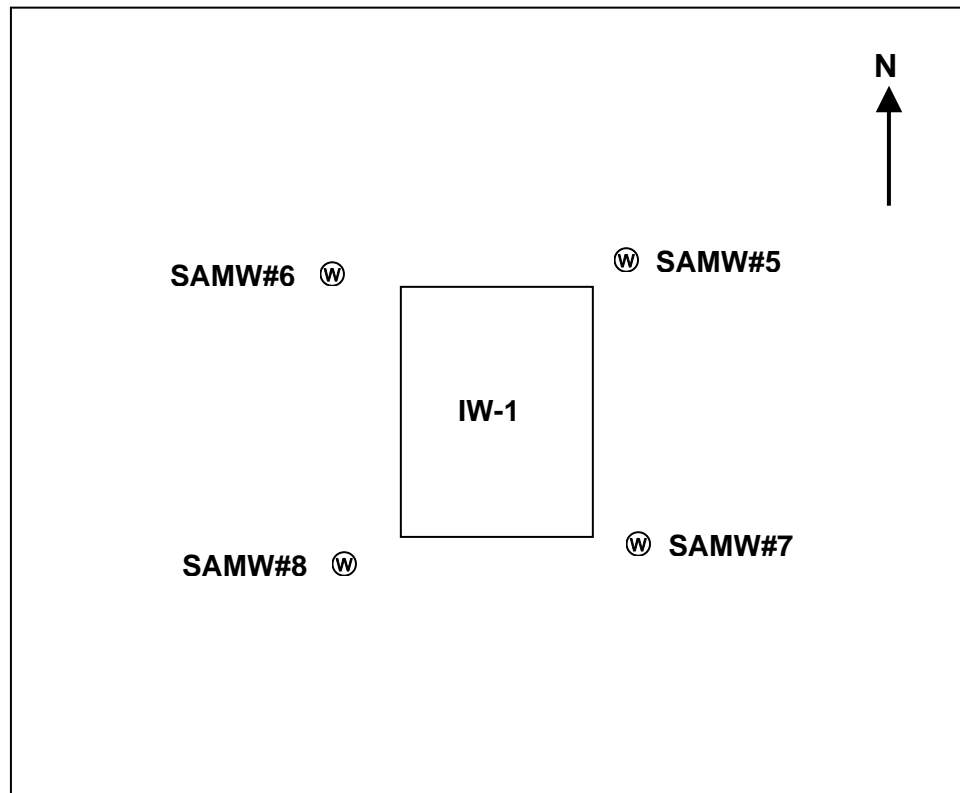
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.81	3.15	4.91	6.90
WATER LEVEL (NAVD 88)	0.67	0.83	0.94	0.73
CHLORIDE (mg/l)	140	222	140	94.0
CONDUCTIVITY (µmhos/cm)	1016	1224	1122	922
TEMPERATURE (C)	25.1	25.0	25.5	25.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Sample Date 5-28-10

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 1 PERMIT # 0289249-001-UC

SAMPLING DATE 5/28 /10 TIME 1120-1145

LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.79	3.18	4.73	6.95
WATER LEVEL (NAVD 88)	0.69	0.80	1.12	0.68
CHLORIDE (mg/l)	180	200	124	80.0
CONDUCTIVITY (µmhos/cm)	1520	1330	923	773
TEMPERATURE (C)	25.7	25.6	25.7	25.7

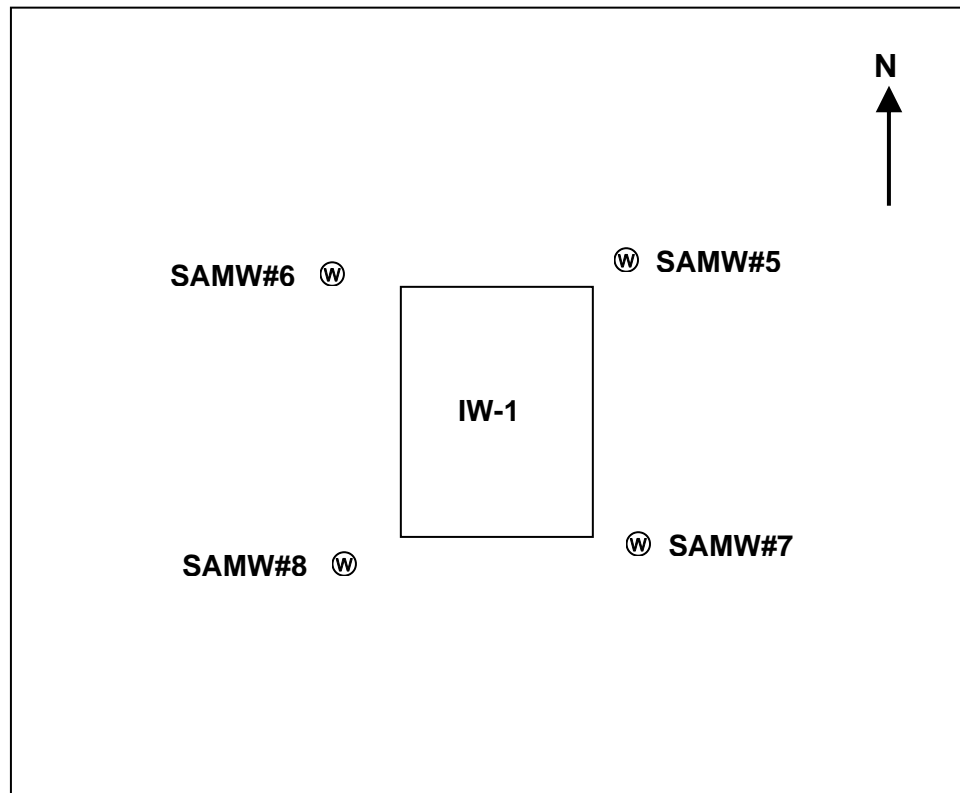
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Sample Date 6-4-10
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 1 PERMIT # 0289249-001-UC
 SAMPLING DATE 6/4/10 TIME 1015-1054

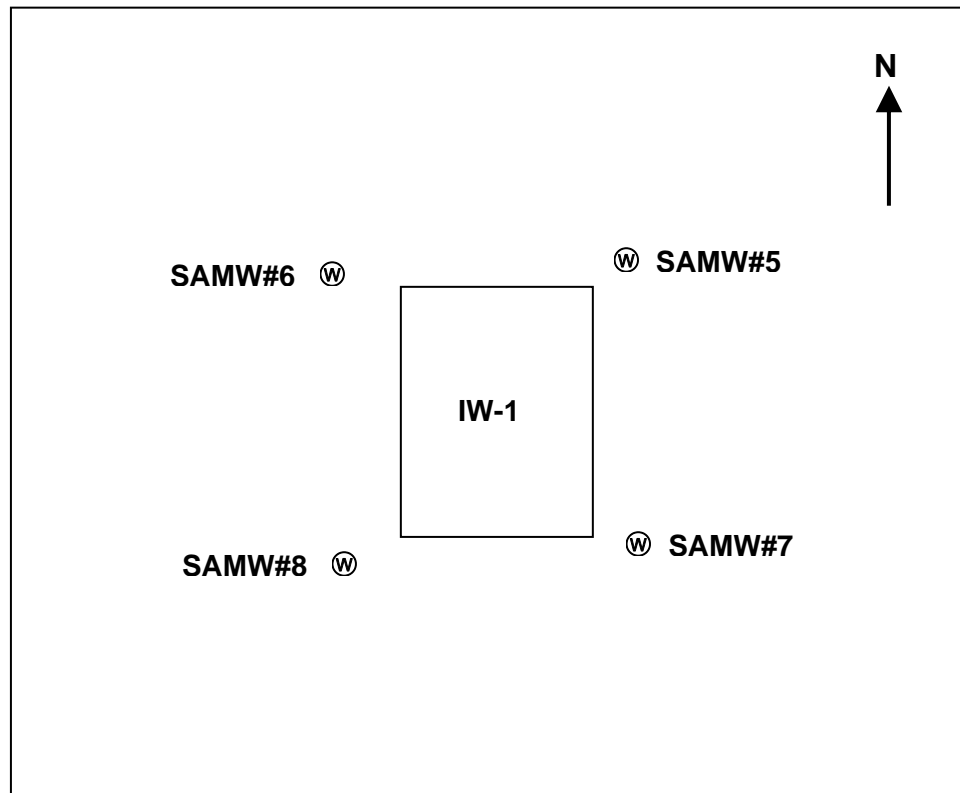
LOCATION	SAMW #5	SAMW #6	SAMW #7	SAMW #8
FIELD AND LABORATORY ID	5	6	7	8
ELEV. OF TOC* (NAVD 88)	3.48**	3.98**	5.85**	7.63
DEPTH TO WATER (TOC*)	2.92	4.25	5.00	7.05
WATER LEVEL (NAVD 88)	0.56	-0.27	0.85	0.58
CHLORIDE (mg/l)	142	190	94.0	88.0
CONDUCTIVITY (µmhos/cm)	971	1108	856	840
TEMPERATURE (C)	26.4	26.2	26.3	26.6

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** - new TOC of casing elevation due to cutting of standpipe below grade to facilitate construction.

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
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SITE PLAN OF SAMW LOCATIONS



IW-2

SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Pre-Construction

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 11/05/09 TIME 0745-0844

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	**	**	**	**
DEPTH TO WATER (TOC*)	3.41	4.51	3.60	3.90
WATER LEVEL (NAVD 88)				
CHLORIDE (mg/l)	53.6	59.3	66.1	55.0
CONDUCTIVITY (µmhos/cm)	1081	1089	990	1044
TOTAL DISOLV. SOLIDS (mg/l)	844	840	736	788
TEMPERATURE (C)	26.8	26.7	26.7	26.4

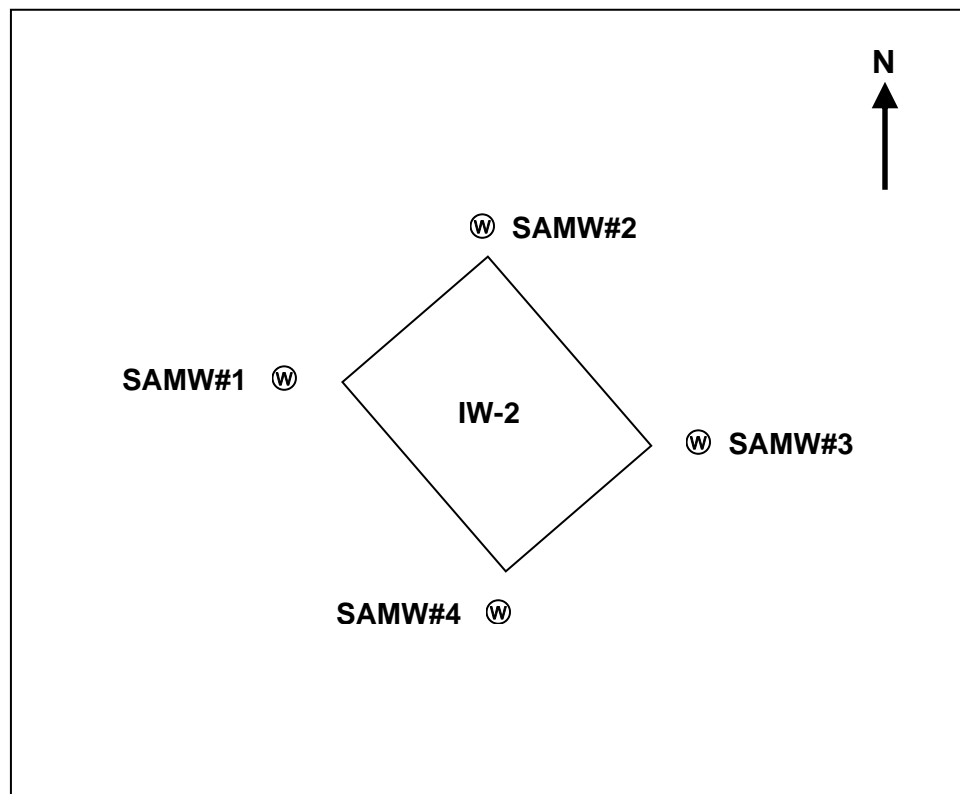
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 2

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 11/13/09 TIME 1135-1410

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	**	**	**	**
DEPTH TO WATER (TOC*)	2.71	4.55	3.62	3.80
WATER LEVEL (NAVD 88)				
CHLORIDE (mg/l)	48.6	52.8	69.4	56.2
CONDUCTIVITY (µmhos/cm)	1060	1079	948	1052
TOTAL DISOLV. SOLIDS (mg/l)	854	876	800	824
TEMPERATURE (C)	26.8	26.4	26.2	26.1

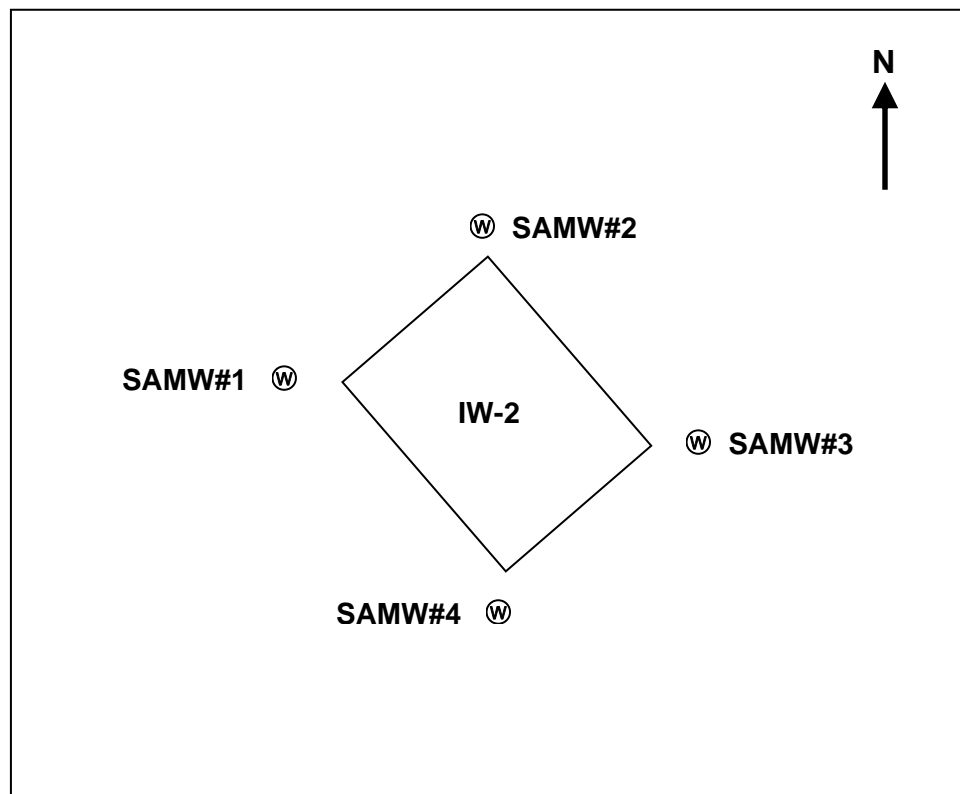
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 3

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 11/18/09 TIME 1135-1410

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	2.67	5.51	3.73	3.90
WATER LEVEL (NAVD 88)	1.96	-0.12	0.82	0.77
CHLORIDE (mg/l)	56	56	86	64
CONDUCTIVITY (µmhos/cm)	1062	1083	934	1048
TOTAL DISOLV. SOLIDS (mg/l)	828	844	728	824
TEMPERATURE (C)	26.9	26.4	26.2	26.2

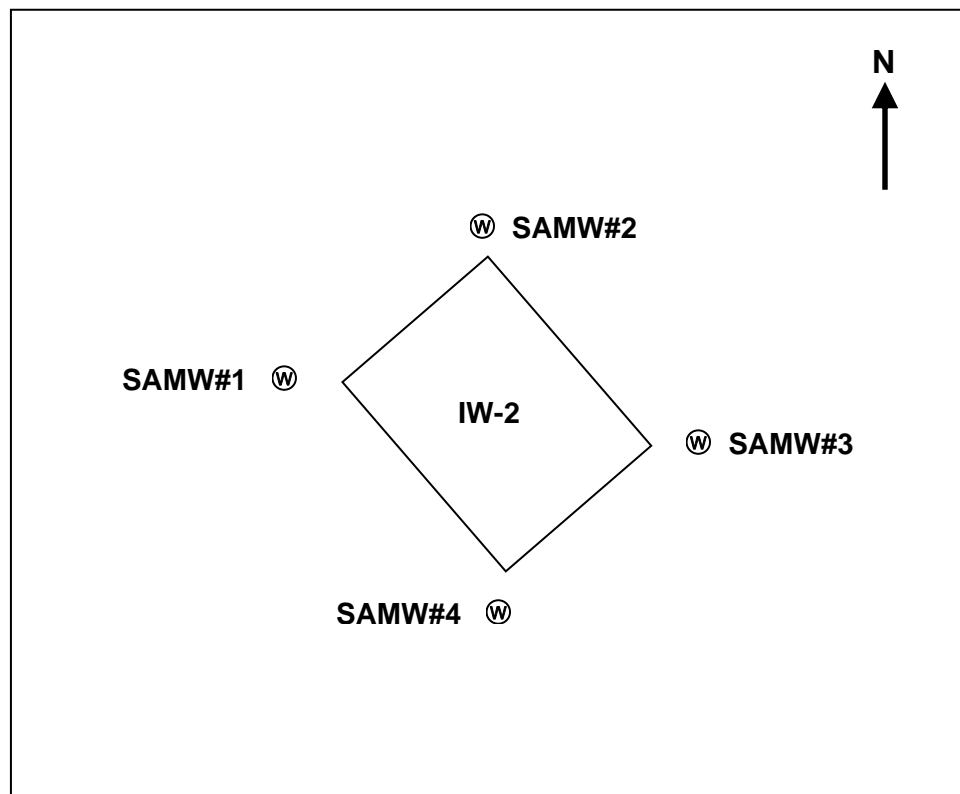
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 4
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 2 PERMIT # 0289249-001-UC
 SAMPLING DATE 11/27/09 TIME 1217-1355

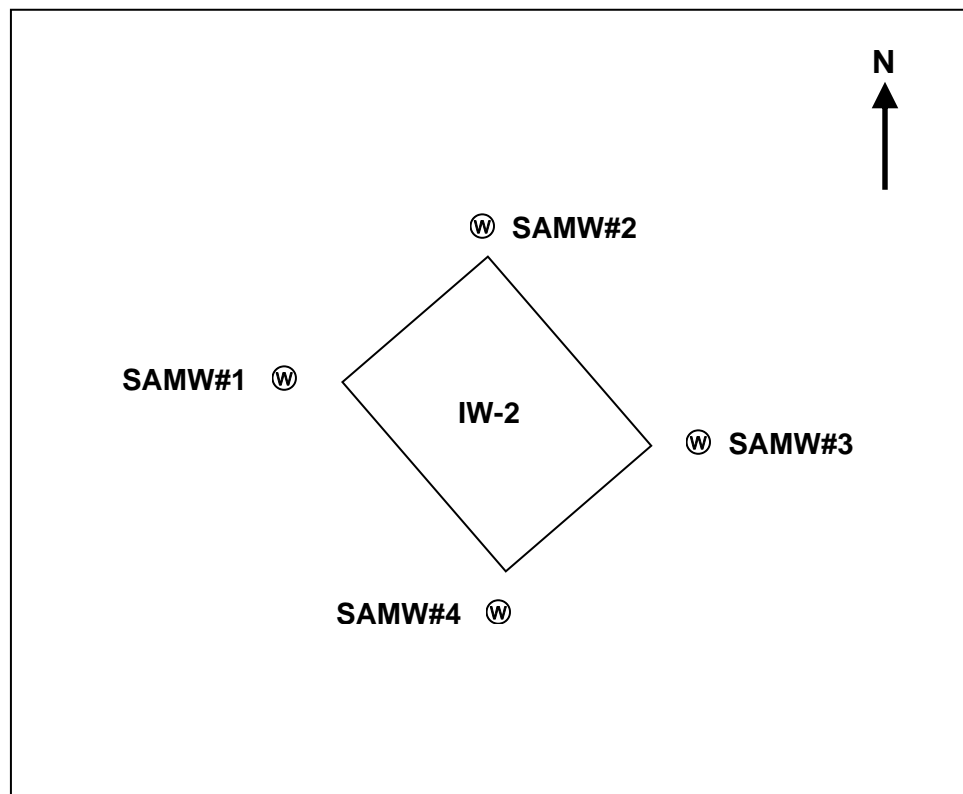
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.22	4.00	3.10	3.35
WATER LEVEL (NAVD 88)	1.41	1.39	1.45	1.32
CHLORIDE (mg/l)	66	66	78	60
CONDUCTIVITY (µmhos/cm)	1103	1084	1029	1238
TOTAL DISOLV. SOLIDS (mg/l)	890	860	798	944
TEMPERATURE (C)	25.7	25.7	25.6	25.4

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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 5

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 12/04/09 TIME 1229-1412

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.64	4.32	3.46	3.81
WATER LEVEL (NAVD 88)	0.99	1.07	1.09	0.86
CHLORIDE (mg/l)	70.0	70.0	82.0	66.0
CONDUCTIVITY (µmhos/cm)	1207	1286	1076	1170
TOTAL DISOLV. SOLIDS (mg/l)	816	836	744	808
TEMPERATURE (C)	26.1	25.7	25.5	25.3

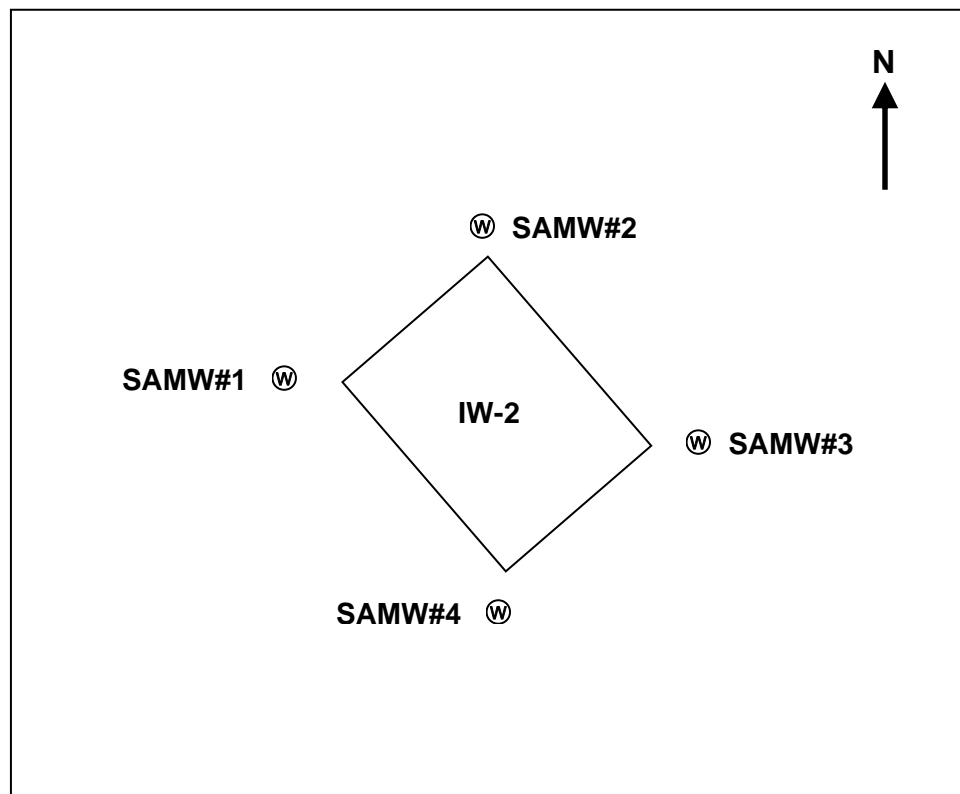
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 6

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 12/09/09 TIME 1005-1135

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.75	4.45	3.54	3.80
WATER LEVEL (NAVD 88)	0.88	0.94	1.01	0.87
CHLORIDE (mg/l)	70.0	70.0	80.0	70.0
CONDUCTIVITY (µmhos/cm)	1321	1195	1119	1269
TOTAL DISOLV. SOLIDS (mg/l)	948	816	746	836
TEMPERATURE (C)	26.7	25.9	25.9	25.3

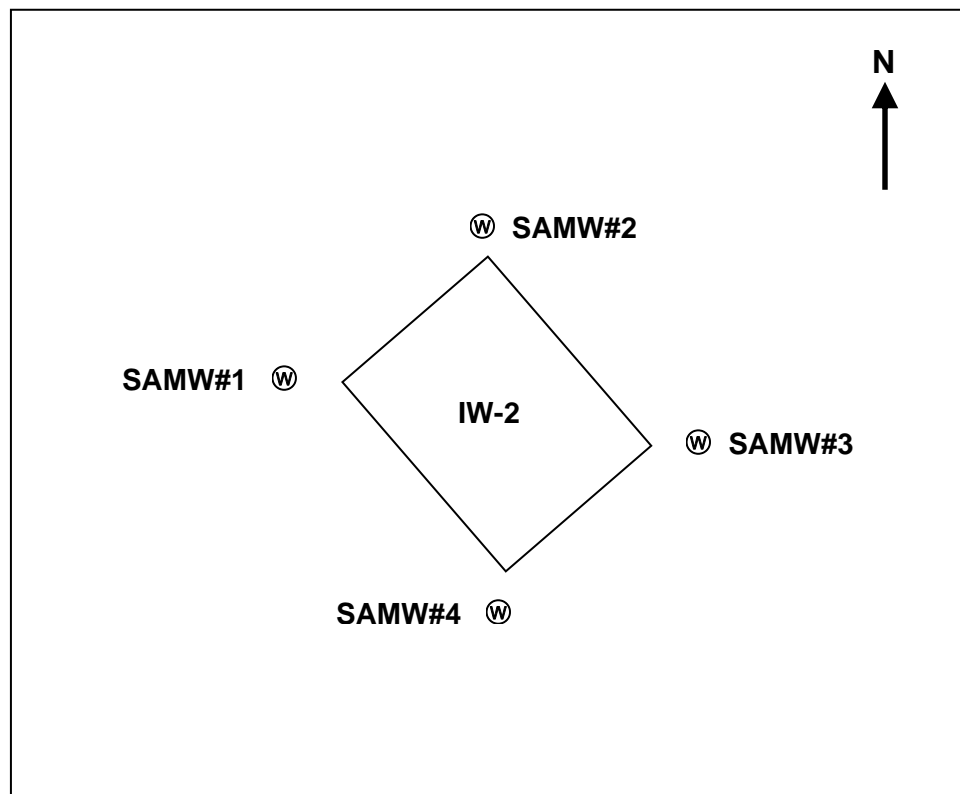
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 7

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 12/18/09 TIME 1147-1215

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.31	3.18	3.49	3.16
WATER LEVEL (NAVD 88)	1.32	2.21	1.06	1.51
CHLORIDE (mg/l)	64.0	70.0	74.0	68.0
CONDUCTIVITY (µmhos/cm)	1193	1157	1012	1152
TEMPERATURE (C)	26.8	26.7	26.0	26.4

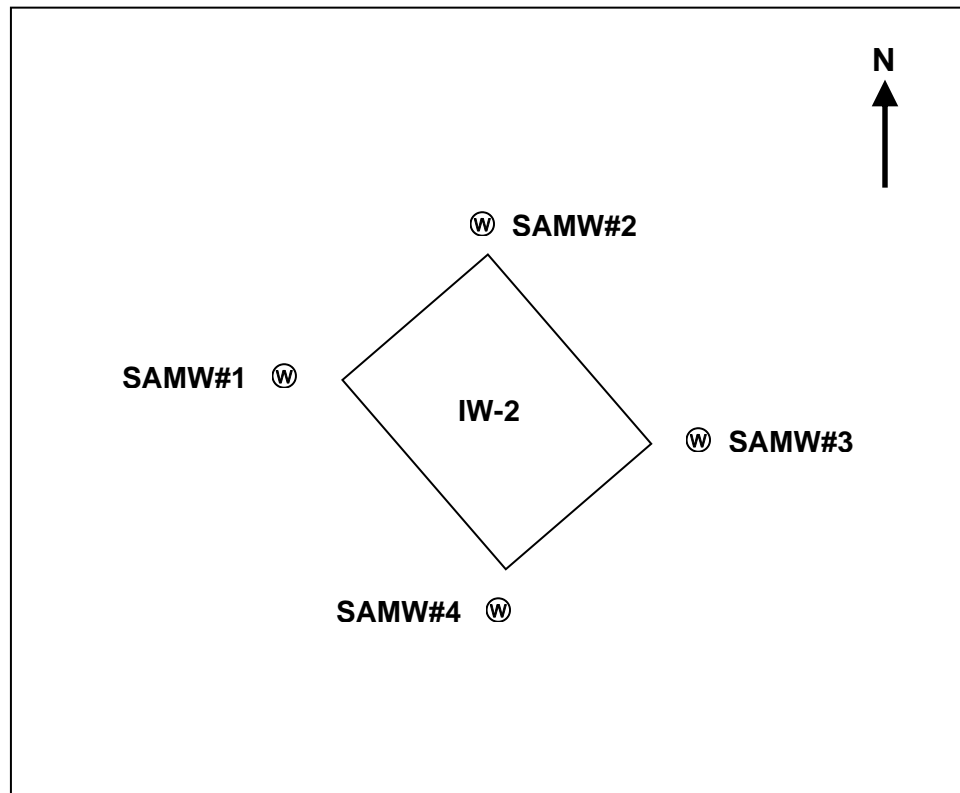
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 8

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 12/22/09 TIME 1145-1300

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.30	4.31	3.41	3.62
WATER LEVEL (NAVD 88)	1.33	1.08	1.14	1.05
CHLORIDE (mg/l)	64.0	74.0	76.0	70.0
CONDUCTIVITY (µmhos/cm)	1321	1365	1153	1451
TEMPERATURE (C)	25.8	25.1	24.9	24.9

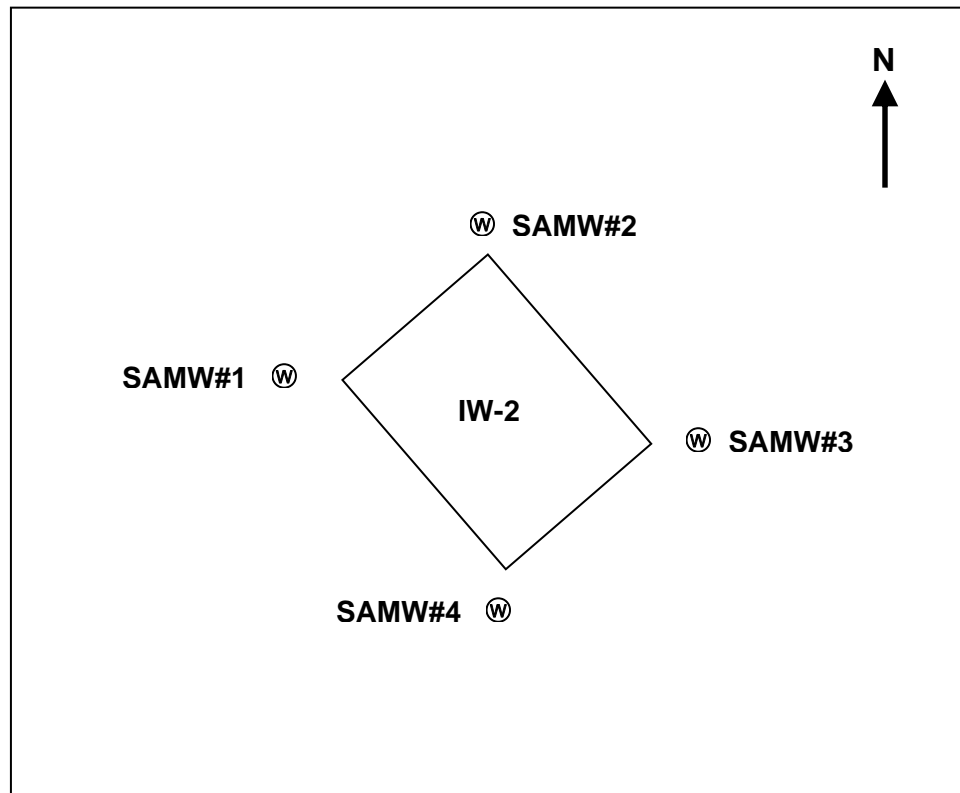
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 9

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 12/28/09 TIME 0925-1054

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.71	5.00	3.63	3.82
WATER LEVEL (NAVD 88)	0.92	0.39	0.92	0.85
CHLORIDE (mg/l)	70.0	72.0	78.0	64.0
CONDUCTIVITY (µmhos/cm)	1327	1402	1143	1387
TEMPERATURE (C)	25.6	24.2	24.5	23.5

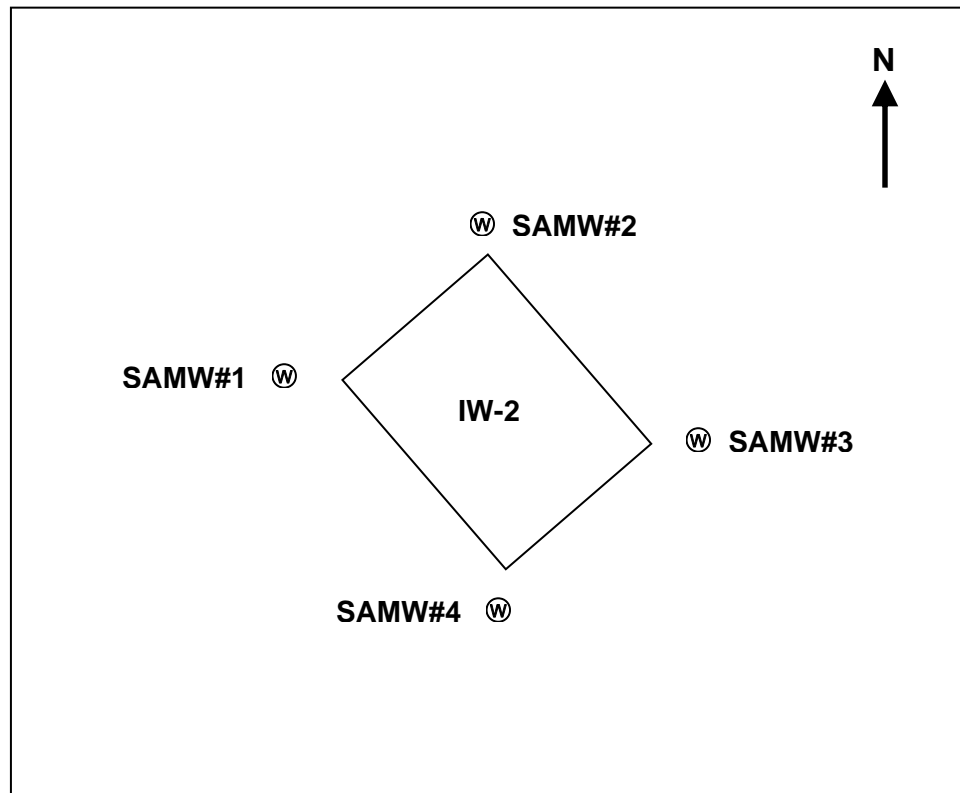
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 10 (1/8/10-1/15/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 1/8/10 TIME 1130-1240

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.68	3.79	3.98
WATER LEVEL (NAVD 88)	0.73	0.71	0.76	0.69
CHLORIDE (mg/l)	62.0	60.0	74.0	62.0
CONDUCTIVITY (µmhos/cm)	1186	1130	1056	1196
TEMPERATURE (C)	25.6	24.6	24.6	24.0

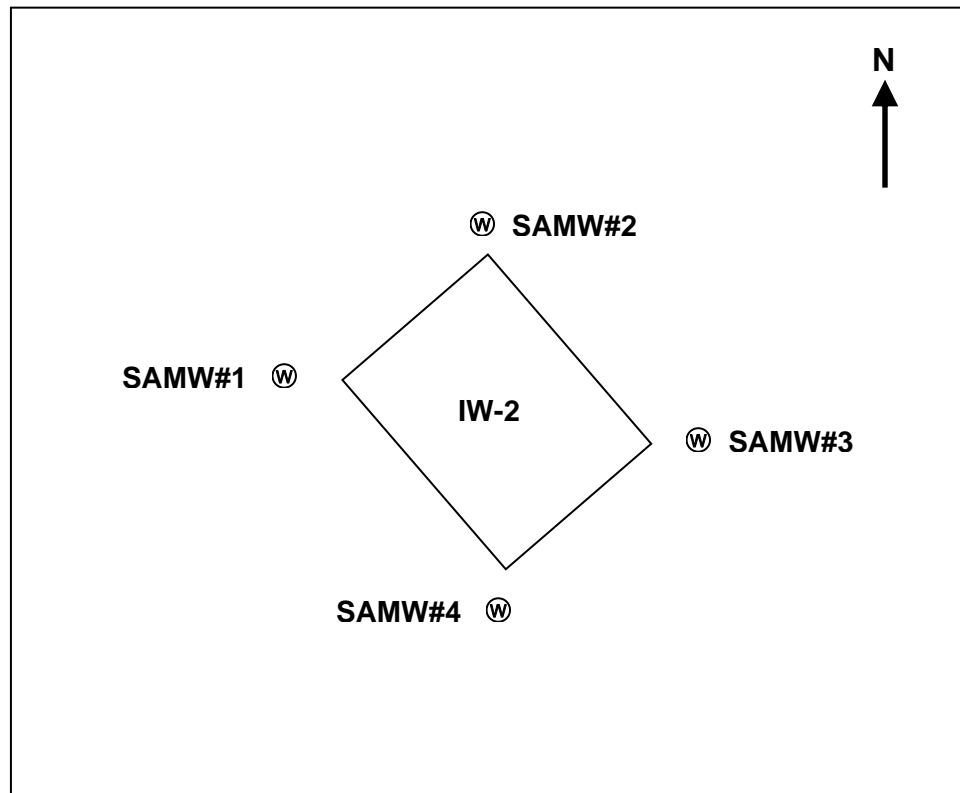
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 11 (1/15/10-1/22/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 1/15/10 TIME 1105-1234

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	4.00	4.80	3.92	4.10
WATER LEVEL (NAVD 88)	0.63	0.59	0.63	0.57
CHLORIDE (mg/l)	51.5	54.0	67.5	54.7
CONDUCTIVITY (µmhos/cm)	1137	1117	1050	1157
TEMPERATURE (C)	25.2	24.2	24.0	23.6

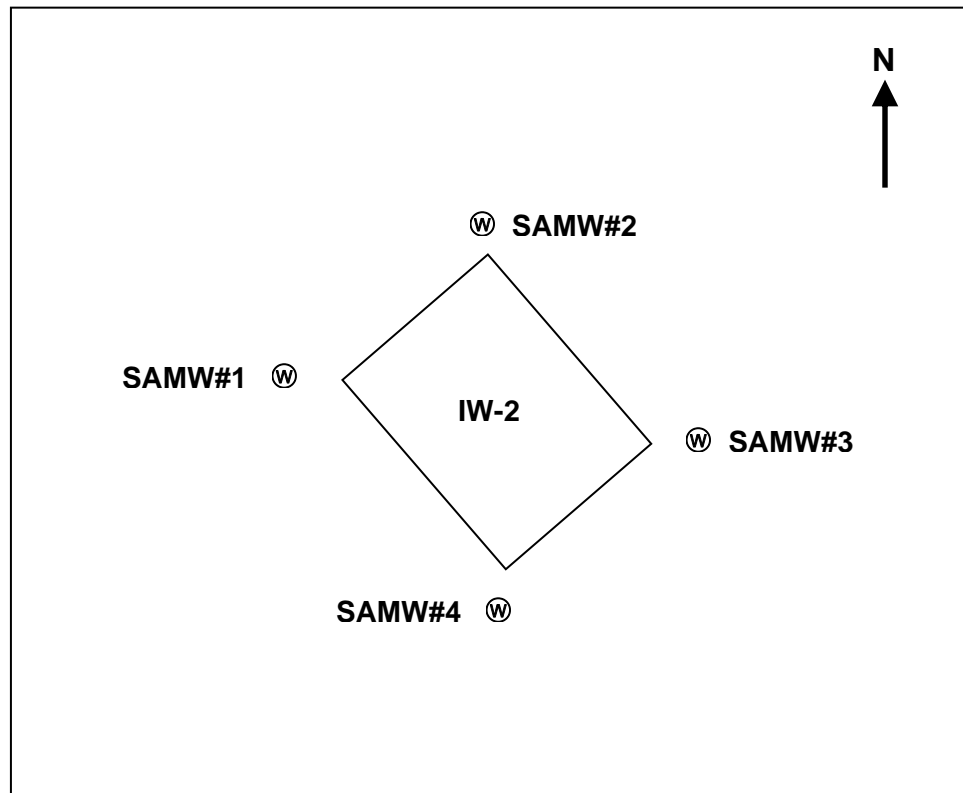
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 12 (1/22/10-1/29/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 1/18/10 TIME 1255-1414

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.68	3.82	3.93
WATER LEVEL (NAVD 88)	0.73	0.71	0.73	0.74
CHLORIDE (mg/l)	62.0	62.0	78.0	70.0
CONDUCTIVITY (µmhos/cm)	1177	1047	1028	1205
TEMPERATURE (C)	25.4	24.0	24.1	23.4

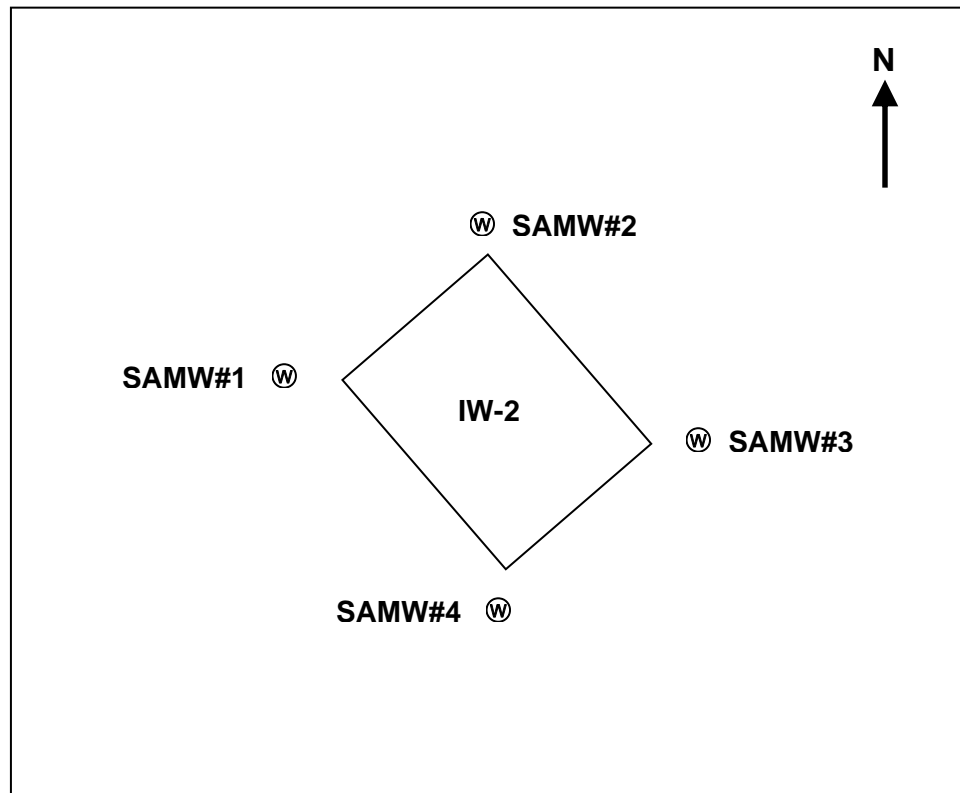
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 13 (1/29/10-2/5/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 1/28/10 TIME 1255-1414

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.66	3.83	3.95
WATER LEVEL (NAVD 88)	0.73	0.73	0.72	0.72
CHLORIDE (mg/l)	64.0	66.0	82.0	86.0
CONDUCTIVITY (µmhos/cm)	1090	1005	1026	1168
TEMPERATURE (C)	25.0	24.0	23.8	23.7

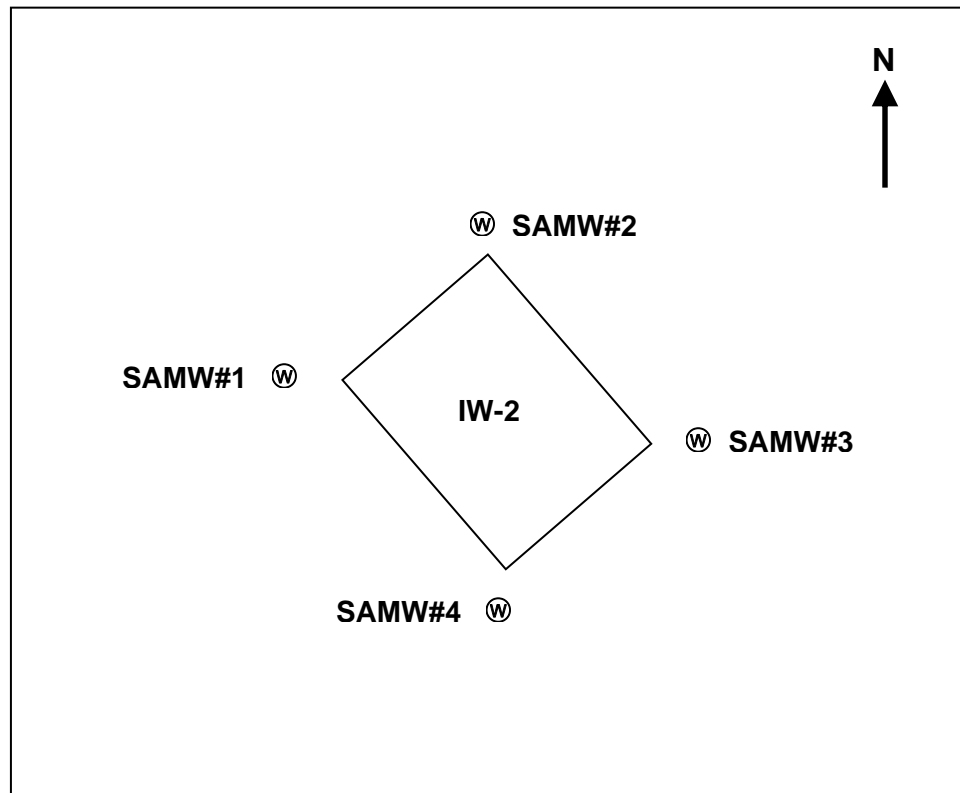
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 14 (2/5/10 – 2/14/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 2/5/10 TIME 1029-1117

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.14	3.91	3.03	3.21
WATER LEVEL (NAVD 88)	1.49	1.48	1.52	1.46
CHLORIDE (mg/l)	60.0	66.0	108	86.0
CONDUCTIVITY (µmhos/cm)	1078	1157	1175	1225
TEMPERATURE (C)	23.7	25.1	24.5	24.5

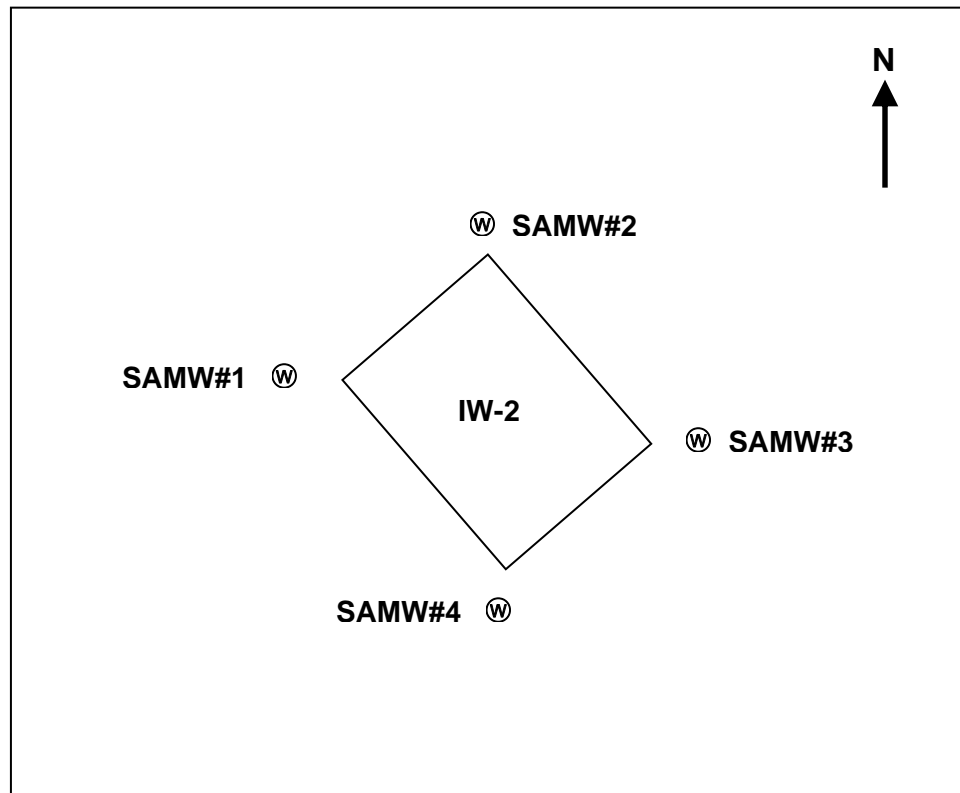
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ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 15 (2/12/10 – 2/19/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 2/11/10 TIME 1145-1355

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.58	4.39	3.45	3.72
WATER LEVEL (NAVD 88)	1.05	1.00	1.10	0.95
CHLORIDE (mg/l)	62.0	72.0	100	84.0
CONDUCTIVITY (µmhos/cm)	1149	1260	1102	932
TEMPERATURE (C)	24.4	23.1	23.2	23.2

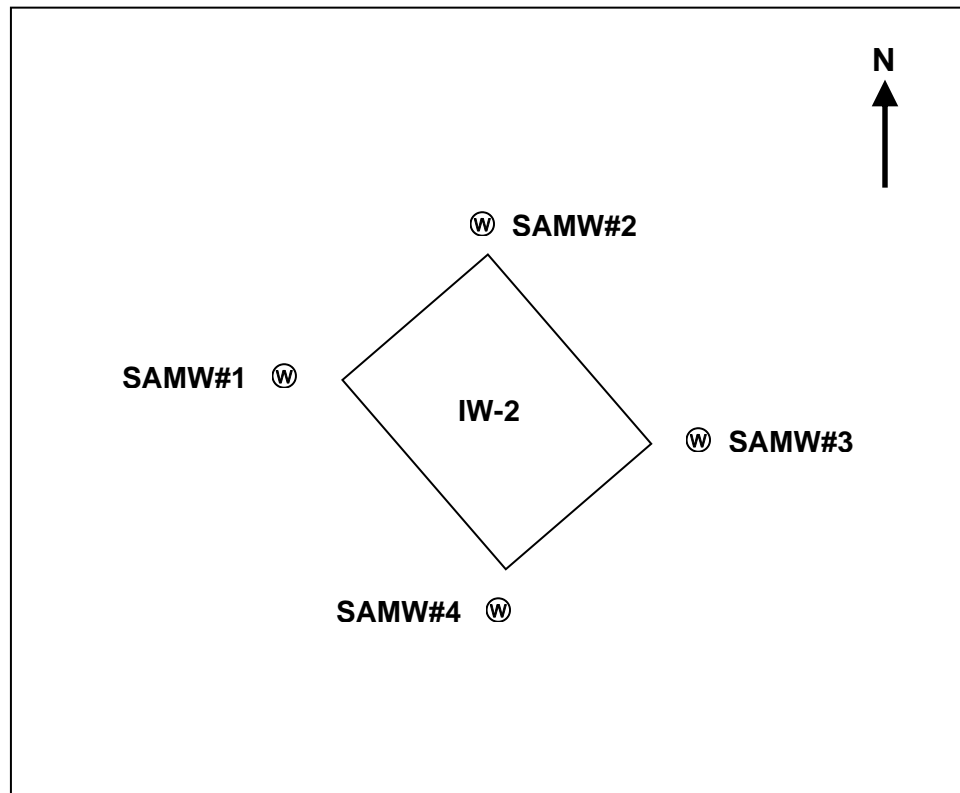
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PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 16 (2/19/10 – 2/25/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 2/19/10 TIME 1105-1210

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.68	3.95	3.94
WATER LEVEL (NAVD 88)	0.73	0.71	0.60	0.73
CHLORIDE (mg/l)	60.0	70.0	88.0	74.0
CONDUCTIVITY (µmhos/cm)	1129	1099	1175	1177
TEMPERATURE (C)	25.0	23.3	23.7	23.6

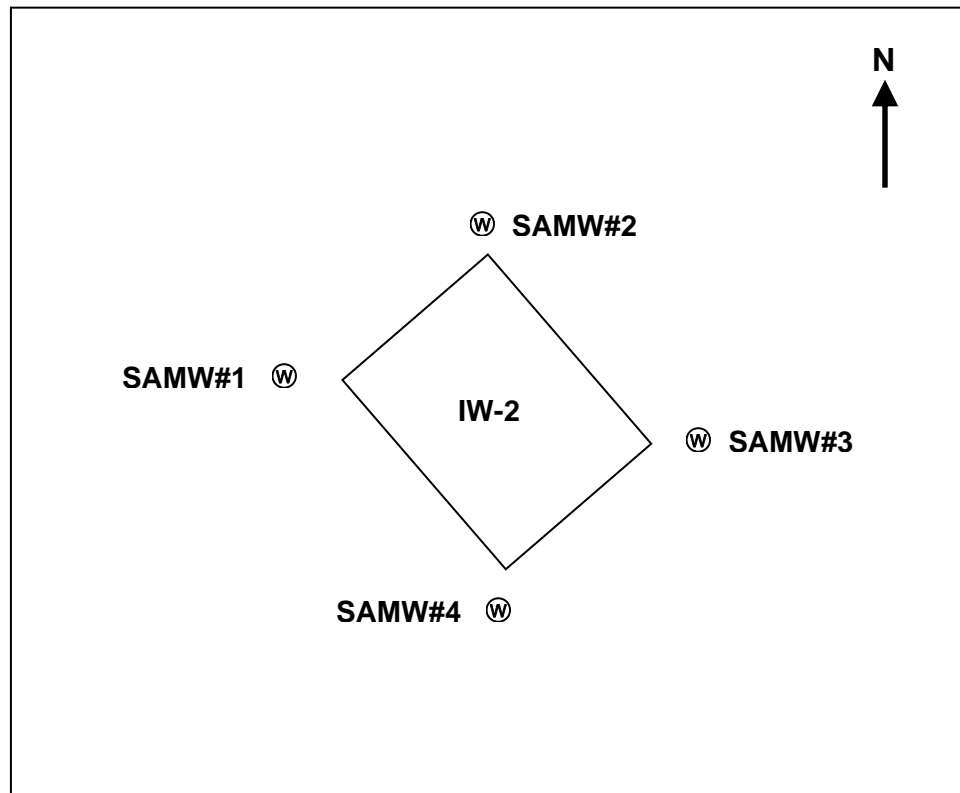
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Week 17 (2/26/10 – 3/5/10)
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 2 PERMIT # 0289249-001-UC
 SAMPLING DATE 2/26/10 TIME 0939-1105

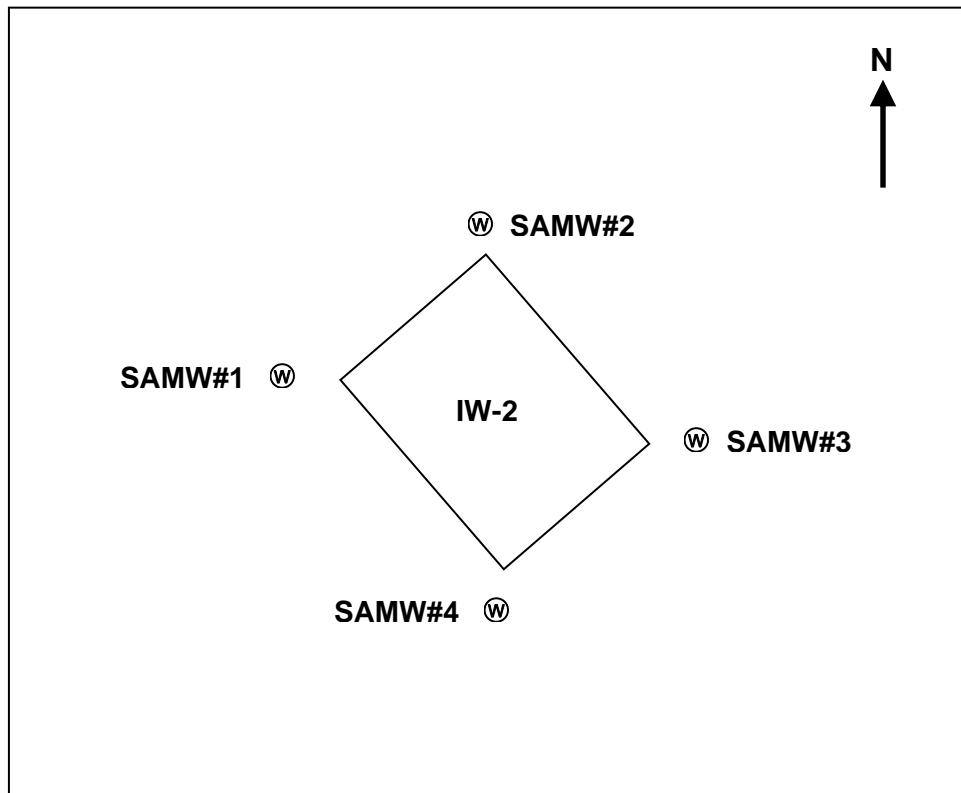
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.78	4.55	3.67	3.85
WATER LEVEL (NAVD 88)	0.85	0.84	0.88	0.82
CHLORIDE (mg/l)	62.0	64.0	84.0	76.0
CONDUCTIVITY (µmhos/cm)	1042	985	1001	1027
TEMPERATURE (C)	24.5	23.6	23.7	27.3

*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 18 (3/5/10 – 3/12/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 3/5/10 TIME 1029-1153

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.85	4.64	3.78	3.90
WATER LEVEL (NAVD 88)	0.78	0.75	0.77	0.77
CHLORIDE (mg/l)	68.0	70.0	82.0	74.0
CONDUCTIVITY (µmhos/cm)	1070	1044	1015	1059
TEMPERATURE (C)	24.6	23.8	23.3	22.1

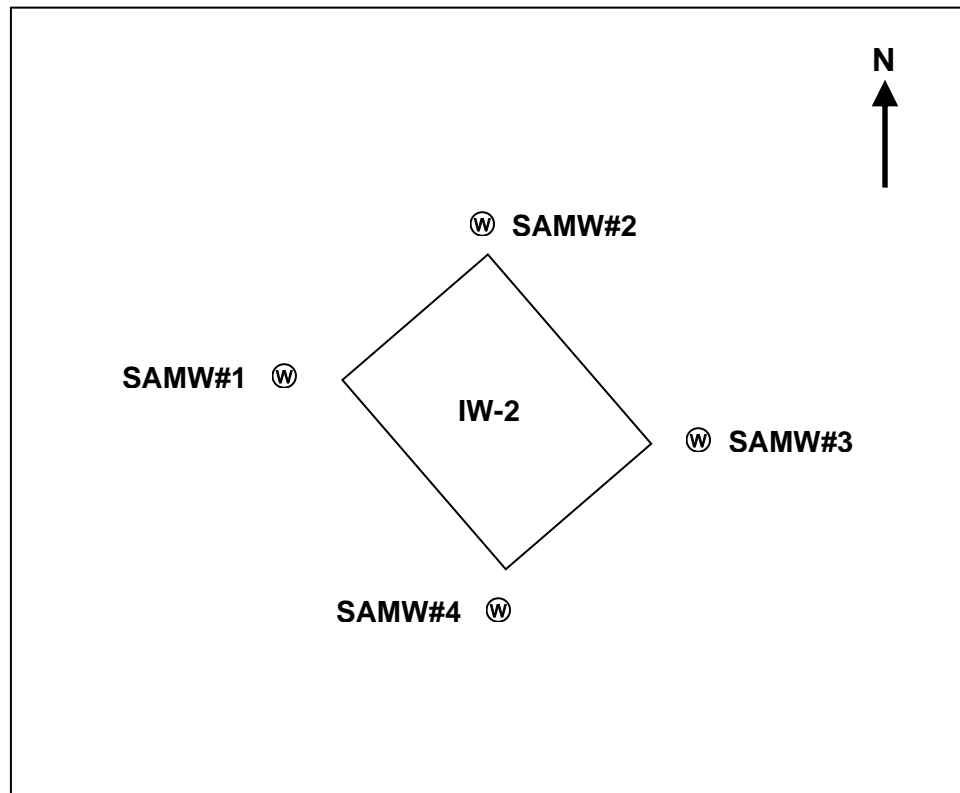
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 19 (3/12/10 – 3/19/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 3/12/10 TIME 1157-1243

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.75	4.55	3.40	3.90
WATER LEVEL (NAVD 88)	0.88	0.84	1.15	0.77
CHLORIDE (mg/l)	64.0	64.0	78.0	70.0
CONDUCTIVITY (µmhos/cm)	1065	1011	987	1041
TEMPERATURE (C)	24.8	24.1	23.2	23.5

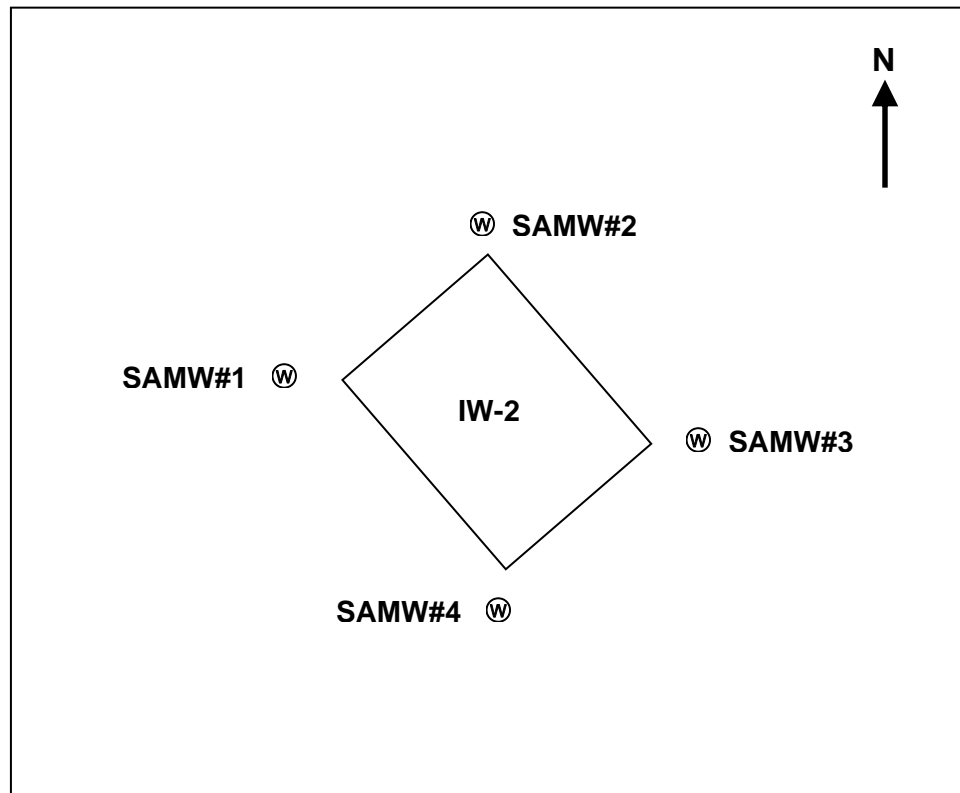
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 20 (3/19/10 – 3/26/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 3/19/10 TIME 1154-1245

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.95	4.71	3.85	4.00
WATER LEVEL (NAVD 88)	0.68	0.68	0.70	0.67
CHLORIDE (mg/l)	64.0	64.0	88.0	70.0
CONDUCTIVITY (µmhos/cm)	1037	1105	1181	1242
TEMPERATURE (C)	22.5	23.4	22.8	22.9

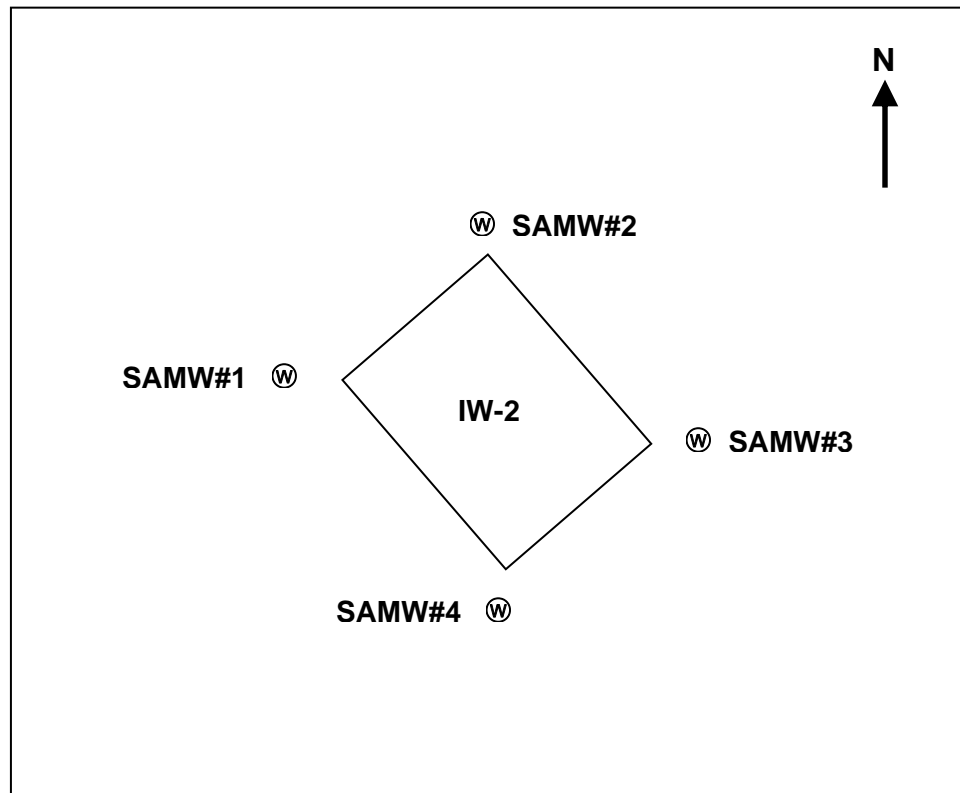
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 21 (3/26/10 – 4/2/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 3/26/10 TIME 1230-1435

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.40	4.18	3.33	3.48
WATER LEVEL (NAVD 88)	1.23	1.21	1.22	1.19
CHLORIDE (mg/l)	74.0	66.0	96.0	70.0
CONDUCTIVITY (µmhos/cm)	1174	1015	1294	1172
TEMPERATURE (C)	22.1	22.2	23.3	23.9

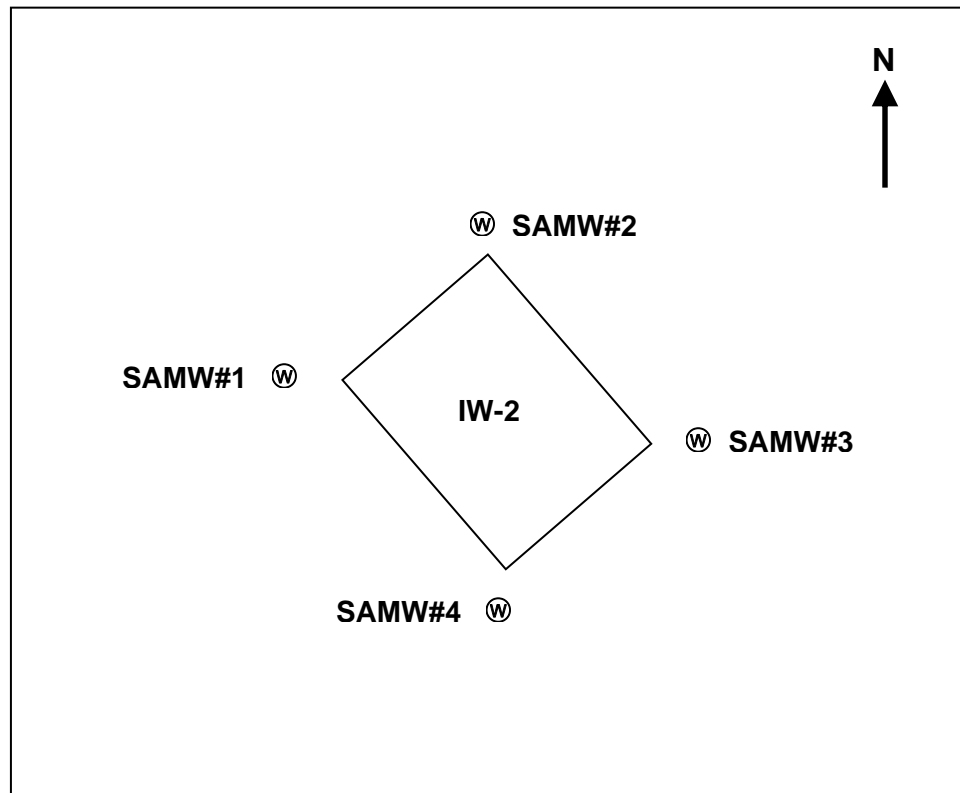
*TOC: indicates the “top of the casing” of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 22 (4/2/10-4/9/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 4/2/10 TIME 1147-1246

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	4.73	4.44	3.62	3.76
WATER LEVEL (NAVD 88)	-0.10	0.95	0.93	0.91
CHLORIDE (mg/l)	70.0	72.0	82.0	86.0
CONDUCTIVITY (µmhos/cm)	1042	1129	1059	1211
TEMPERATURE (C)	24.9	25.7	24.4	24.1

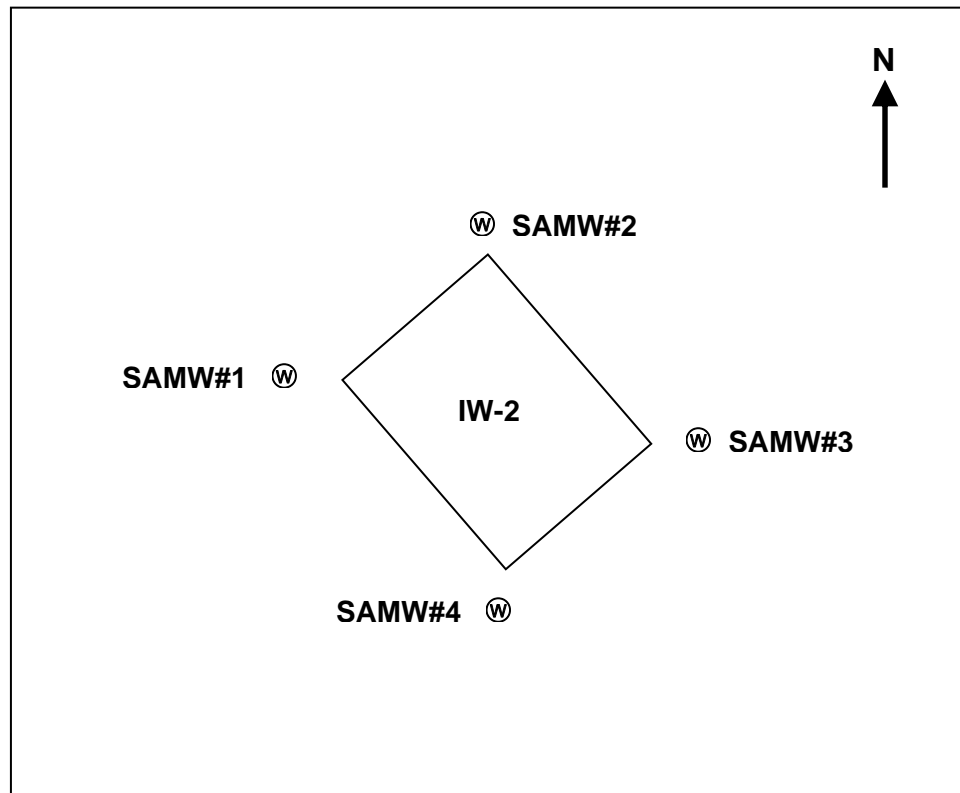
*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

** - Elevation of Top of Casing will be resurveyed and submitted along with next weekly report

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 23 (4/9/10-4/16/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 4/9/10 TIME 1036-1101

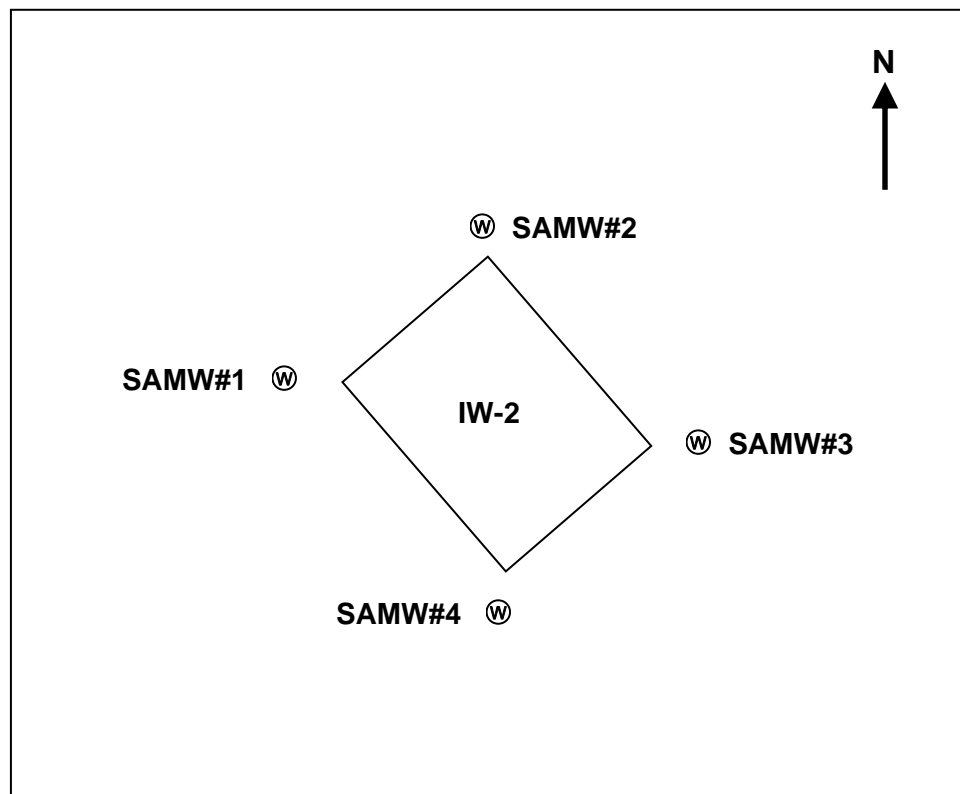
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	5.79	5.55	3.69	3.83
WATER LEVEL (NAVD 88)	-1.16	0.16	0.86	0.84
CHLORIDE (mg/l)	68.0	62.0	80.0	80.0
CONDUCTIVITY (µmhos/cm)	1067	981	1093	996
TEMPERATURE (C)	25.6	24.8	24.4	24.2

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 24 (4/16/10-4/23/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 4/16/10 TIME 1304-1425

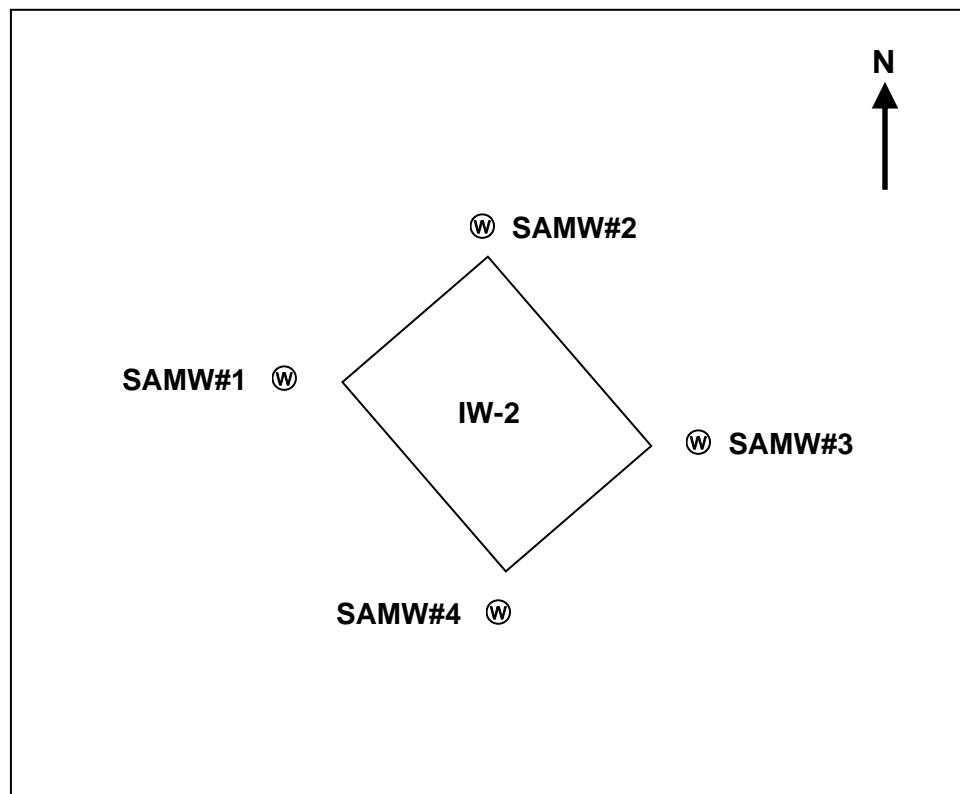
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.72	3.83	3.99
WATER LEVEL (NAVD 88)	0.73	0.67	0.72	0.68
CHLORIDE (mg/l)	62.0	64.0	80.0	78.0
CONDUCTIVITY (µmhos/cm)	987	909	914	1069
TEMPERATURE (C)	24.9	24.4	24.1	24.5

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 25 (4/23/10-4/30/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 4/23/10 TIME 1320-1435

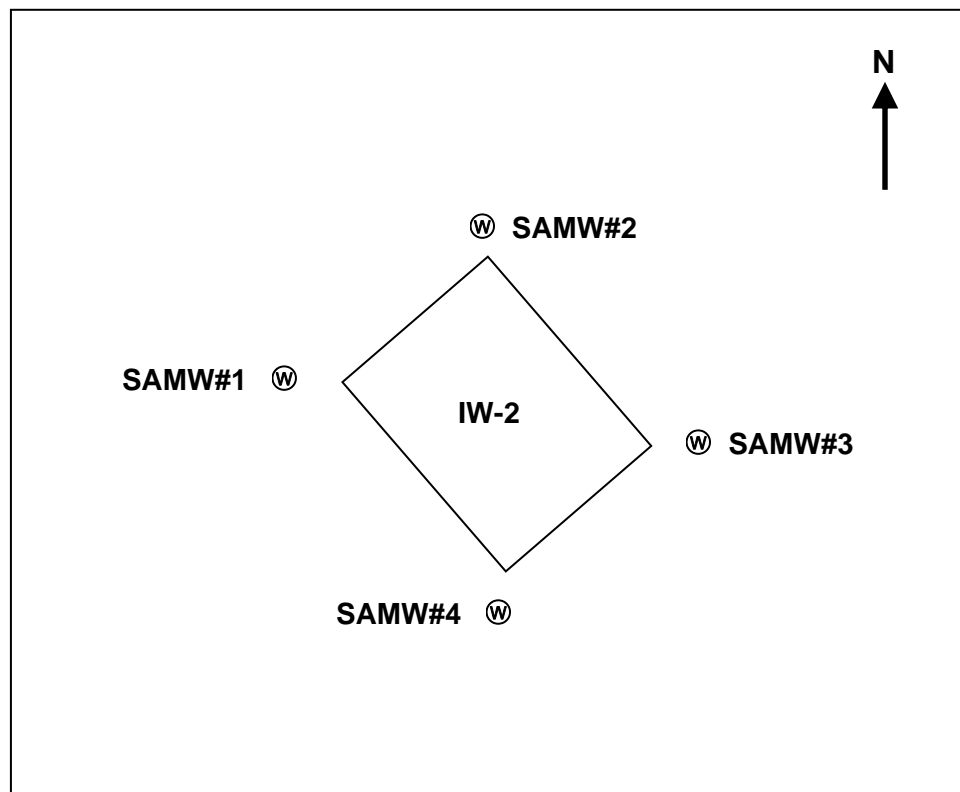
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.58	4.33	3.50	3.72
WATER LEVEL (NAVD 88)	1.05	1.06	1.05	0.95
CHLORIDE (mg/l)	96.0	76.0	236	84.0
CONDUCTIVITY (µmhos/cm)	1022	939	1382	1052
TEMPERATURE (C)	25.5	24.7	24.3	24.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 26 (4/30/10-5/7/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 4/30/10 TIME 1011-1046

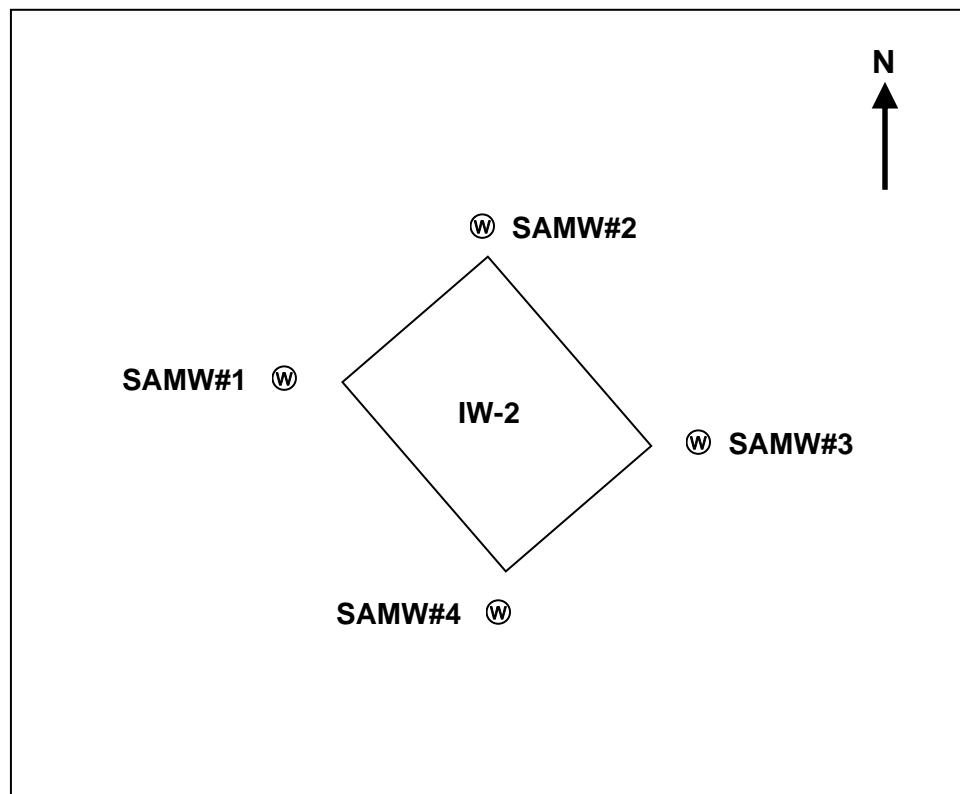
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.68	4.35	3.49	3.66
WATER LEVEL (NAVD 88)	0.95	1.04	1.06	1.01
CHLORIDE (mg/l)	80.0	76.0	200	84.0
CONDUCTIVITY (µmhos/cm)	958	915	1245	1017
TEMPERATURE (C)	25.6	25.1	24.5	24.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 27 (5/7/10-5/14/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 5/7/10 TIME 1215-1339

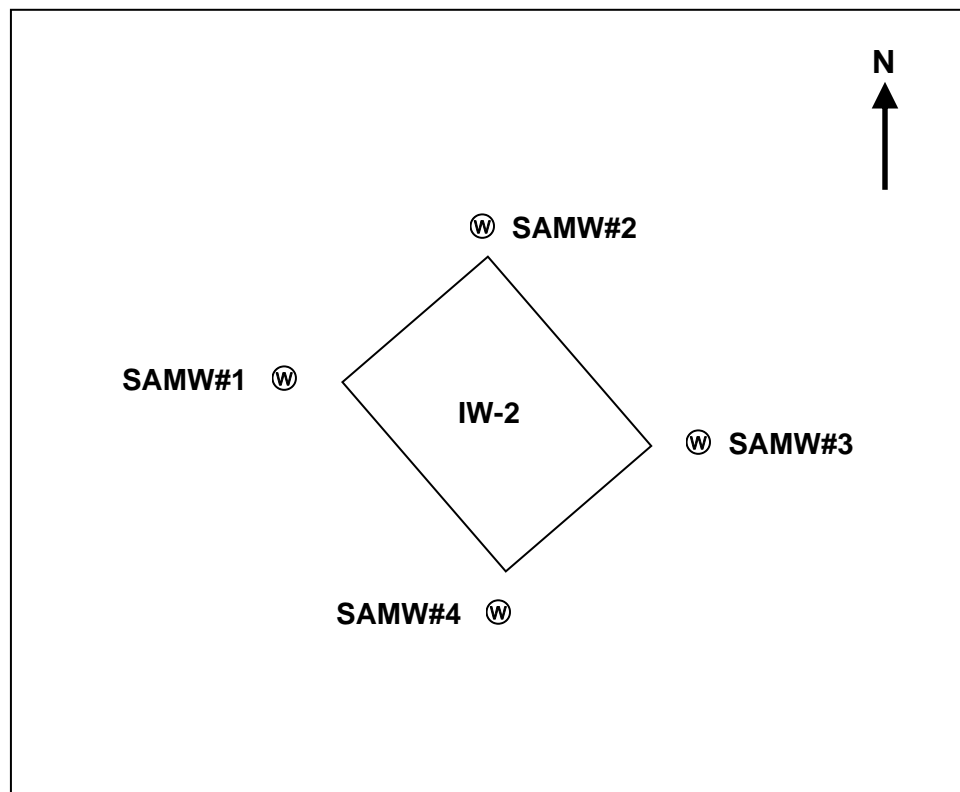
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	4.00	4.78	3.88	4.07
WATER LEVEL (NAVD 88)	0.63	0.61	0.67	0.60
CHLORIDE (mg/l)	80.0	74.0	142	80.0
CONDUCTIVITY (µmhos/cm)	1073	996	1113	1047
TEMPERATURE (C)	26.1	25.5	24.7	24.8

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Week 28 (5/14/10-5/21/10)

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 5/14/10 TIME 1445-1559

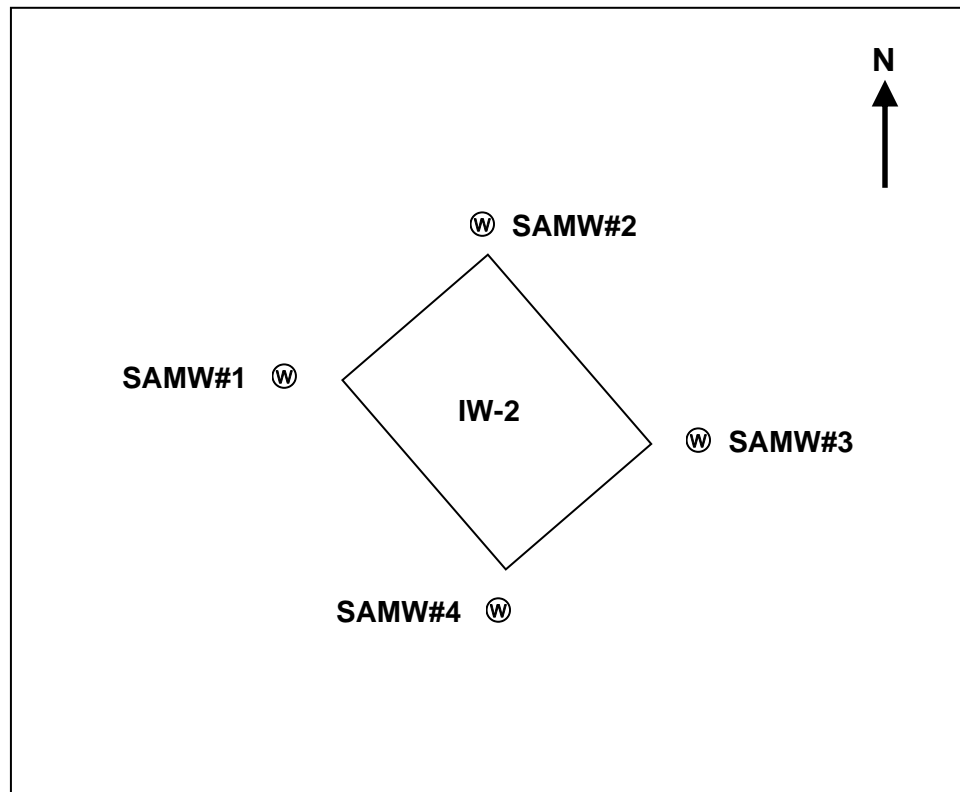
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	4.08	4.83	4.04	4.12
WATER LEVEL (NAVD 88)	0.55	0.56	0.51	0.55
CHLORIDE (mg/l)	102	70.0	112	86.0
CONDUCTIVITY (µmhos/cm)	1235	976	1075	1053
TEMPERATURE (C)	25.3	25.1	24.6	25.1

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



WELL COMPLETION REPORT

FORM 0124
Rev. 11/90

WELL PERMIT NO.

SFWMD WATER USE PERMIT NO.

City of Hialeah 16500 NW 97 Ave Hialeah FL 33010
 Owner: Dan Ruff Address: SW D 11244 License No. 11-4-09 City 4 State 14' Zip 1
 Contractor's Signature: [Signature] Completion Date: 11-4-09 Casing Depth: 14' Total Depth: 14' Well # 1

TYPE OF WORK: Construct () Repair () Abandon ()

WELL USE: Domestic Well () Public () Monitor () Test ()

Irrigation () FireWell () Other

METHOD: Rotary with MUD () or Air () Cable Tool () Jet ()

Casing Driven () Other Auger

STATIC WATER LEVEL 6' Ft. below top of casing Surface

PUMPING WATER LEVEL Ft. after Hrs. at GPM

PUMP SIZE H.P. CAPACITY GPM

PUMP TYPE INTAKE DEPTH From top of ground

LOCATION

Located Near

County Dade

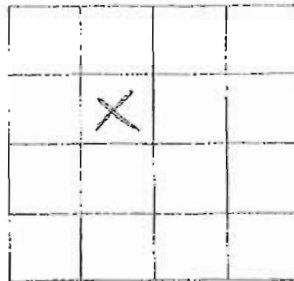
SE NW 16 52S 40E

1/4 1/2 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
() No

Note: PWS Wells attach a site map if well location is different from site location on permit application.



LOCATE IN SECTION

Grout	Casing & Screen	Depth (ft)		Drill Cuttings Log Examine cuttings every 20 ft. or at formation changes. Give color, grain size and type of material. Note cavities, depth to producing zones.
		From	To	
2"	2"	0		
1"	2"			
	4"			
	2"			
	14'			
Debris, Trace organics, muck, cap rock				

Casing: Black Steel () Galv. () PVC () Fiberglass ()

Screen: Type PVC Slot size 10

Screened from 4 (ft.) to 14 (ft.)

Type of grout with % additives Neat

Water: Clear () Colored () Sulphur () Salty () Iron ()

Conductivity Chlorides mg/l

WELL COMPLETION REPORT

FORM 0124
Rev. 11/90

WELL PERMIT NO.

SFWMD WATER USE PERMIT NO.

City of Hialeah 16500 NW 97 Ave Hialeah FL 33010
 Owner: Dan Ruff Address: SW D 11244 License No. 11-4-09 City 4 State 14' Zip 2
 Contractor's Signature: [Signature] Completion Date: 11-4-09 Casing Depth: 14' Total Depth: 14' Well # 2

TYPE OF WORK: Construct () Repair () Abandon ()

WELL USE: Domestic Well () Public () Monitor () Test ()

Irrigation () FireWell () Other

METHOD: Rotary with MUD () or Air () Cable Tool () Jet ()

Casing Driven () Other Auger

STATIC WATER LEVEL 6' Ft. below top of casing Surface

PUMPING WATER LEVEL Ft. after Hrs. at GPM

PUMP SIZE H.P. CAPACITY GPM

PUMP TYPE INTAKE DEPTH From top of ground

LOCATION

Located Near

County Dade

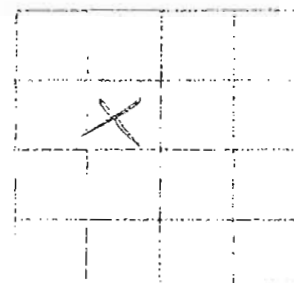
SE NW 16 52S 40E

1/4 1/2 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
() No

Note: PWS Wells attach a site map if well location is different from site location on permit application.



LOCATE IN SECTION

Grout	Casing & Screen	Depth (ft)		Drill Cuttings Log Examine cuttings every 20 ft. or at formation changes. Give color, grain size and type of material. Note cavities, depth to producing zones.
		From	To	
2"	2"	0		
1"	2"			
	4"			
	2"			
	14'			
Debris, Trace organics, muck, limestone cap				

Casing: Black Steel () Galv. () PVC () Fiberglass ()

Screen: Type PVC Slot size 10

Screened from 4 (ft.) to 14 (ft.)

Type of grout with % additives Neat

Water: Clear () Colored () Sulphur () Salty () Iron ()

Conductivity Chlorides mg/l

FORM 0124
Rev. 11/90

SFWMD WATER USE PERMIT NO.

Owner John J. Long Address 5601 124th City 11-4-07 State 11.5 Zip (3)
Contractor's Signature _____ License No. _____ Completion Date _____ Casing Depth _____ Total Depth _____ Well # _____

TYPE OF WORK: Construct (☒) Repair (☐) Abandon (☐)
WELL USE: Domestic Well (☐) Public (☐) Monitor (☒) Test (☐)
Irrigation (☐) FireWell (☐) Other _____
METHOD: Rotary with MUD (☐) or Air (☐), Cable Tool (☐), Jot (☐)
Casing Driven (☐), Other Auger
STATIC WATER LEVEL 3.5 Ft. below top of casing Surface
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____
From top of ground _____

Located Near _____

County Isade

SE NW 16 S25 40E
1/4 1/4 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
(X) No

Note: PWS Wells attach a site map if well location is different from site location on permit application.

A 5x5 grid with an 'X' in the center cell.

LOCATE IN SECTION

[illegible]

Casing: Black Steel () Galv. () PVC (✓) Fiberglass ()
Screen: Type 20 Galv. () Screen size 10
Screened from 1.5 (ft.) to 11.5 (ft.)
Type of grout with % additives None
Water: Clear (✓) Colored () Sulphur () Salty () Iron ()
Conductivity _____ Chlorides _____ mg/l

FORM 0124
Rev. 11/90

SFWMD WATER USE PERMIT NO.

Owner _____ Address SWD 11244 City 1.5 State 1.5 Zip (4)

Contractor's Signature _____ License No. _____ Completion Date _____ Casing Depth _____ Total Depth _____ Wells _____

TYPE OF WORK: Construct () Repair () Abandon ()
WELL USE: Domestic Well () Public () Monitor () Test ()
Irrigation () FireWell () Other Repair
METHOD: Rotary with MUD () or Air (). Cable Tool () Jet ()
Casing Driven (), Other _____
STATIC WATER LEVEL 3.5 Ft. below top of casing Surface
PUMPING WATER LEVEL _____ Ft. after _____ Hrs. at _____ GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____
From top of ground

Located Near _____


County Dade

SE NW 1, 525 10E
1/4 1/4 Section Township Range

Latitude-Longitude

Cuttings sent to District? () Yes
(x) No

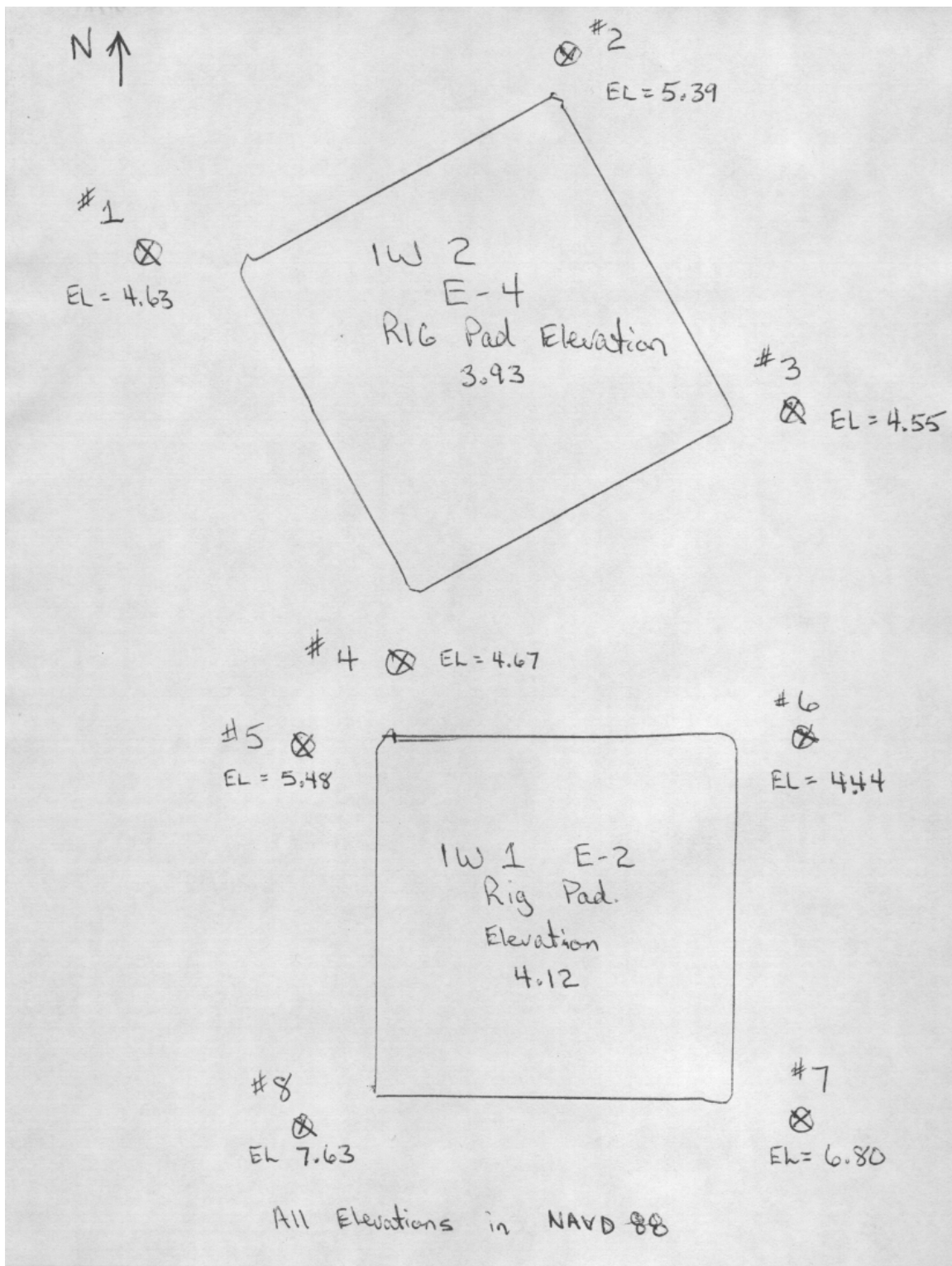
Note: PWS Wells attach a site map if well location is different from site location on permit application.



LOCATE IN SECTION

[illegible]

Casing: Black Steel () Galv. () PVC ☒ Fiberglass ()
Screen: Type PVC Slot size 10
Screened from 1.5 (ft.) to 11.5 (ft.)
Type of grout with % additives W200
Water: Clear ☒ Colored () Sulphur () Salty () Iron ()
Conductivity _____ Chlorides _____ mg/l



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

FACILITY NAME City of Hialeah RO WTP

REPORT MONTH/YR. Sample Date 5-21-10

OPERATOR NAME _____ LICENSE # _____

INJECTION WELL # 2 PERMIT # 0289249-001-UC

SAMPLING DATE 5/21/10 TIME 1029-1144

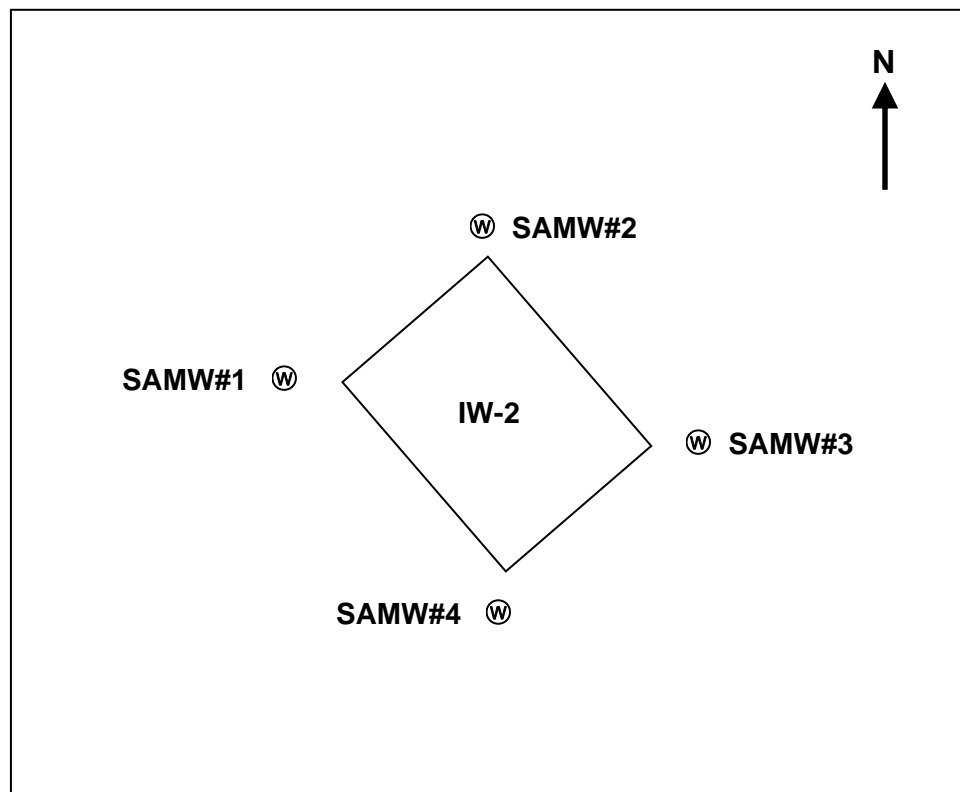
LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.90	4.68	3.82	3.95
WATER LEVEL (NAVD 88)	0.73	0.71	0.73	0.72
CHLORIDE (mg/l)	94.0	68.0	98.0	80.0
CONDUCTIVITY (µmhos/cm)	1154	947	1027	948
TEMPERATURE (C)	25.6	25.6	25.1	25.5

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.

PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

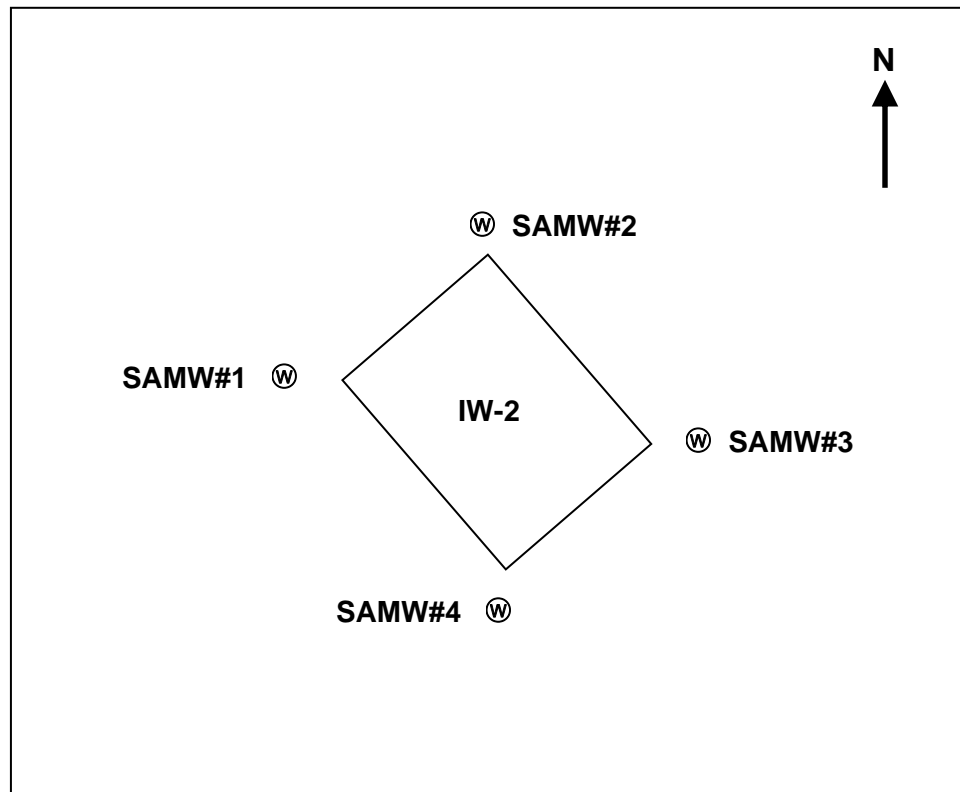
FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Sample Date 5-28-10
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 2 PERMIT # 0289249-001-UC
 SAMPLING DATE 5/28/10 TIME 1005-1041

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	3.98	4.21	3.83	3.99
WATER LEVEL (NAVD 88)	0.65	1.18	0.72	0.68
CHLORIDE (mg/l)	90.0	64.0	88.0	70.0
CONDUCTIVITY (µmhos/cm)	1249	1137	1220	1237
TEMPERATURE (C)	26.0	26.1	25.9	26.1

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



SOUTHEAST DISTRICT UIC SECTION SURFICIAL AQUIFER MONITOR WELL (SAMW) REPORT

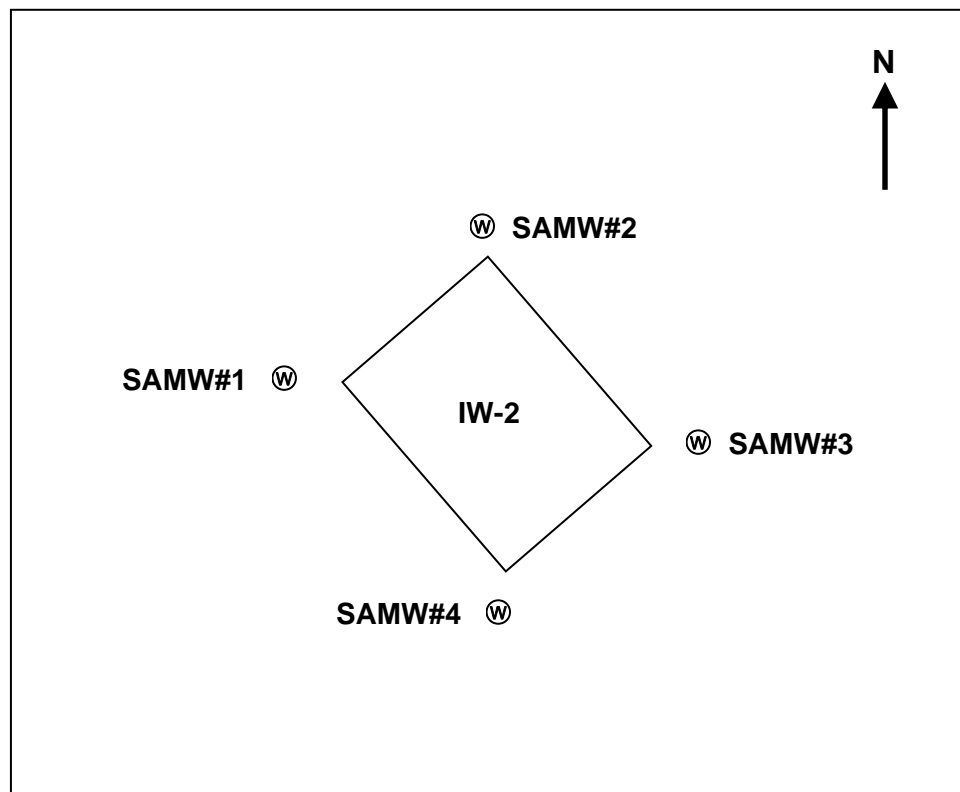
FACILITY NAME City of Hialeah RO WTP
 REPORT MONTH/YR. Sample Date 6-4-10
 OPERATOR NAME _____ LICENSE # _____
 INJECTION WELL # 2 PERMIT # 0289249-001-UC
 SAMPLING DATE 6/4/10 TIME 1114-1149

LOCATION	SAMW #1	SAMW #2	SAMW #3	SAMW #4
FIELD AND LABORATORY ID	1	2	3	4
ELEV. OF TOC* (NAVD 88)	4.63	5.39	4.55	4.67
DEPTH TO WATER (TOC*)	4.07	4.87	3.10	4.18
WATER LEVEL (NAVD 88)	0.56	0.52	1.45	0.49
CHLORIDE (mg/l)	90.0	70.0	86.0	82.0
CONDUCTIVITY (µmhos/cm)	980	851	905	930
TEMPERATURE (C)	26.6	26.5	26.4	26.7

*TOC: indicates the "top of the casing" of the Surficial Aquifer Monitor Well

ANALYZED BY Florida Spectrum Environmental Services, Inc. SAMPLED BY: Youngquist Brothers, Inc.
 PHONE # (954) 978-6400 TITLE _____

SITE PLAN OF SAMW LOCATIONS



Appendix H

IW-1

FRP CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/18/10

CASING DIAMETER: 16-inch

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
1	10000168	28.69	28.69		809	D. Barnes
2	8762	29.70	58.39	810	825	D. Barnes
3	8762	29.50	87.89	835	842	D. Barnes
4	1110000168	29.72	117.61	843	851	D. Barnes
5	1110000168	29.67	147.28	852	900	D. Barnes
6	100000142	29.73	177.01	901	907	D. Barnes
7	100000142	29.69	206.70	908	914	D. Barnes
8	110000090	29.70	236.40	915	922	D. Barnes
9	100000142	29.70	266.10	923	929	D. Barnes
10	100000142	29.67	295.77	929	936	D. Barnes
11	110000134	29.67	325.44	937	941	D. Barnes
12	110000010	29.67	355.11	942	948	D. Barnes
13	8762	29.71	384.82	949	955	D. Barnes
14	8762	29.69	414.51	956	1003	D. Barnes
15	8762	29.66	444.17	1004	1010	D. Barnes
16	110000090	29.64	473.81	1011	1015	D. Barnes
17	210000086	29.74	503.55	1016	1020	D. Barnes
18	110000090	29.68	533.23	1021	1029	D. Barnes
19	110000090	29.20	562.43	1030	1035	D. Barnes
20	110000090	29.19	591.62	1036	1044	D. Barnes
21	110000134	29.24	620.86	1045	1051	D. Barnes
22	210000086	29.17	650.03	1052	1057	D. Barnes
23	110000168	29.13	679.16	1058	1105	D. Barnes
24	110000168	29.14	708.30	1106	1110	D. Barnes
25	110000168	29.23	737.53	1111	1116	D. Barnes
26	110000168	29.49	767.02	1112	1122	D. Barnes
27	110000168	30.01	797.03	1123	1129	D. Barnes
28	110000168	29.68	826.71	1130	1136	D. Barnes
29	110000168	29.16	855.87	1137	1143	D. Barnes
30	110000168	29.15	885.02	1144	1149	D. Barnes
31	110000168	29.14	914.16	1150	1154	D. Barnes
32	110000168	29.18	943.34	1155	1200	D. Barnes
33	110000168	29.02	972.36	1201	1205	D. Barnes
34	110000168	29.12	1001.48	1206	1211	D. Barnes
35	110000168	29.21	1030.69	1212	1217	D. Barnes

FRP CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 2 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/18/10

CASING DIAMETER: 16-inch FRP

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
36	110000168	29.61	1060.30	1218	1222	D. Barnes
37	110000168	29.76	1090.06	1223	1227	D. Barnes
38	110000168	29.62	1119.68	1228	1253	D. Barnes
39	110000168	29.68	1149.36	1254	1258	D. Barnes
40	110000168	29.67	1179.03	1259	1303	D. Barnes
41	110000168	29.69	1208.72	1304	1308	D. Barnes
42	110000168	29.69	1238.41	1309	1314	D. Barnes
43	110000168	29.69	1268.10	1315	1319	D. Barnes
44	110000168	29.66	1297.76	1320	1324	D. Barnes
45	110000168	29.48	1327.24	1325	1328	D. Barnes
46	110000168	29.60	1356.84	1329	1333	D. Barnes
47	110000168	29.70	1386.54	1334	1338	D. Barnes
48	110000168	29.73	1416.27	1340	1344	D. Barnes
49	110000168	29.66	1445.93	1345	1352	D. Barnes
50	110000168	29.70	1475.63	1352	1356	D. Barnes
51	110000168	29.69	1505.32	1357	1401	D. Barnes
52	110000168	29.67	1534.99	1402	1407	D. Barnes
53	110000168	29.70	1564.69	1408	1412	D. Barnes
54	110000168	29.66	1594.35	1413	1417	D. Barnes
55	110000168	29.71	1624.06	1418	1422	D. Barnes
56	110000168	29.73	1653.79	1423	1428	D. Barnes
57	110000168	29.69	1683.48	1428	1432	D. Barnes
58	110000168	29.27	1712.75	1433	1438	D. Barnes
59	110000168	29.65	1742.40	1439	1443	D. Barnes
60	110000168	29.64	1772.04	1444	1448	D. Barnes
61	110000168	29.71	1801.75	1449	1453	D. Barnes
62	110000168	29.71	1831.46	1453	1458	D. Barnes
63	110000168	29.71	1861.17	1459	1504	D. Barnes
64	110000168	29.66	1890.83	1505	1509	D. Barnes
65	110000168	29.73	1920.56	1510	1514	D. Barnes
66	110000168	29.75	1950.31	1515	1519	D. Barnes
67	110000168	29.73	1980.04	1520	1524	D. Barnes
68	110000168	29.69	2009.73	1525	1530	D. Barnes
69	110000168	29.69	2039.42	1530	1534	D. Barnes
70	110000168	29.25	2068.67	1535	1539	D. Barnes

FRP CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 3 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/18/10

CASING DIAMETER: 16-inch FRP

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
71	110000168	29.55	2098.22	1540	1545	D. Barnes
72	110000168	29.66	2127.88	1546	1550	D. Barnes
73	110000168	29.70	2157.58	1531	1556	D. Barnes
74	110000168	29.69	2187.27	1557	1600	D. Barnes
75	110000168	29.57	2216.84	1601	1606	D. Barnes
76	110000168	29.60	2246.44	1607	1611	D. Barnes
77	110000168	29.72	2276.16	1612	1616	D. Barnes
78	110000168	29.70	2305.86	1617	1620	D. Barnes
79	110000168	29.55	2335.41	1621	1626	D. Barnes
80	110000168	29.63	2365.04	1627	1631	D. Barnes
81	110000168	29.72	2394.76	1632	1636	D. Barnes
82	110000168	29.70	2424.46	1637	1641	D. Barnes
83	110000168	29.63	2454.09	1642	1646	D. Barnes
84	110000168	29.19	2483.28	1647	1652	D. Barnes
85	110000168	29.51	2512.79	1653	1657	D. Barnes
86	110000168	29.54	2542.33	1658	1702	D. Barnes
87	110000168	29.69	2572.02	1703	1708	D. Barnes
88	110000168	29.69	2601.71	1709	1712	D. Barnes
89	110000168	29.60	2631.31	1713	1717	D. Barnes
90	110000168	29.65	2660.96	1718	1722	D. Barnes
91	110000168	29.70	2690.66	1723	1728	D. Barnes
92	110000168	29.66	2720.32	1728	1733	D. Barnes
93	110000168	29.65	2749.97	1733	1737	D. Barnes
94	110000168	29.74	2779.71	1739	1743	D. Barnes
95	110000168	29.64	2809.35	1744	1748	D. Barnes
96	110000168	29.67	2839.02	1749	1753	D. Barnes
97	110000168	29.69	2868.71	1754	1759	D. Barnes
98	110000168	29.72	2898.43	1800	1804	D. Barnes
99	110000168	29.66	2928.09	1805	1809	D. Barnes
100	stainless steel	9.0	2937.09	0800 03/19/10	1800 03/19/10	J Abbott
Floor equals 4 ft apl. FRP casing depth bpl (cumulative minus floor) equals 2933 ft bpl. Agrees with 24 inch YBI female packer seat which equals 2974.5 ft bpl (24 inch casing seat) minus 41.60 ft (tape measured distance form bottom of joint 1 to bottom of female packer).						

CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/06/10

CASING DIAMETER: 24 x 0.50 inch

CASING DEPTH: 2974.5 ft bpl

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	OBSERVER
1	987467	80.9	80.9		740	JA
2	10084051	73.51	154.41	825	920	JA
3	10084051,10080551,10080559	64.42	218.83	930	1020	JA
4	174265	64.57	283.4	1030	1126	JA
5	174265	64.02	347.42	1136	1212	JA
6	10080559,10084052,10084051	76.76	424.18	1220	1300	JA
7	10080559,10080551,10084052	73.05	497.23	1310	1350	JA
8	174265	51.6	548.83	1400	1430	JA
9	174265	58.89	607.72	1440	1510	JA
10	174265	65.1	672.82	1520	1554	JA
11	10080551	74.9	747.72	1610	1636	JA
12	10080559,174265,10080551	76.66	824.38	1646	1726	JA
13	10084051,174265,10084052	77.45	901.83	1736	1805	JA
14	10084051,10080551	75.98	977.81	1814	1904	RAS
15	10084052, 10084051, 10080551	75.2	1053.01	1932	2022	RAS
16	174265	66.35	1119.36	2030	2130	RAS
17	10084051	73.75	1193.11	2146	2222	RAS
18	10084052	73.45	1266.56	2239	2304	RAS
19	174265	65.55	1332.11	2318	2346	RAS
20	174265	64.83	1396.94	2357	0036	RAS
21	174265	67.67	1464.61	0045	0110	RAS
22	174265	65.81	1530.42	0130	0202	RAS
23	174265	70.66	1601.08	0211	0249	RAS
24	174265	65.15	1666.23	0255	0344	RAS
25	174265	66.36	1732.59	0352	0418	RAS
26	174265	70.09	1802.68	0427	0500	RAS
27	174265	68.72	1871.4	0515	0619	RAS
28	174265	63.47	1934.87	0626	0751	JA
29	174265	66.91	2001.78	0801	0831	JA
30	174265	68.44	2070.22	0841	0920	JA
31	174265	69.37	2139.59	0930	1013	JA
32	174265	69.99	2209.58	1026	1101	JA
33	174265	76.45	2286.03	1115	1147	JA

CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 2 of 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/06/10

CASING DIAMETER: 24 x 0.50 inch

CASING DEPTH: 2974.5 ft bpl

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	OBSERVER
34	174265	69.23	2355.26	1200	1245	JA
35	174265	69.27	2424.53	1300	1335	JA
36	174265	71.13	2495.66	1343	1438	JA
37	174265	71	2566.66	1448	1535	JA
38	174265	70.38	2637.04	1545	1615	JA
39	174265	70.91	2707.95	1625	1705	JA
40	174265	77.38	2785.33	1715	1744	JA
41	174265	72.6	2857.93	1754	1858	JA
42	174265	76.59	2934.52	1915	1955	RAS
43	174265	63.8	2998.32	2026	2121	RAS
			bottom at 2974.5 ft bpl			
Bottom 40 feet of casing coated with targuard.						
centralizers above casing seat (ft)						
	3	2707				
	80	2857				
	218					
	347					
	497					
	607					
	747					
	901					
	1053					
	1193					
	1332					
	1464					
	1601					
	1732					
	1871					
	2001					
	2139					
	2286					
	2424					
	2566					

CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.:

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE:

CASING DIAMETER: 34 x 0.375 inch

CASING DEPTH:

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	OBSERVER
1	81-07520	29.08	29.08		0750	JA
2	81-07520	39.05	68.13	0759	0836	JA
3	81-11081	39.06	107.19	0846	0915	JA
4	81-07520	39.06	146.25	0920	0950	JA
5	923558	38.7	184.95	1000	1018	JA
6	923597	38.67	223.62	1025	1050	JA
7	923597	38.72	262.34	1101	1132	JA
8	924747	38.69	301.03	1141	1205	JA
9	40832840	50.07	351.1	1215	1246	JA
10	30832820	50.08	401.18	1256	1315	JA
11	742584	50.1	451.28	1325	1345	JA
12	742568	50.12	501.4	1355	1415	JA
13	742575	50.12	551.52	1421	1442	JA
14	742578	49.96	601.48	1451	1511	JA
15	742583	50.09	651.57	1520	1537	JA
16	742578	50.06	701.63	1547	1606	JA
17	742583	50.09	751.72	1616	1635	JA
18	742581	50.1	801.82	1645	1701	JA
19	742596	50.07	851.89	1710	1732	JA
20	742596	50.07	901.96	1742	1802	JA
21	742579	50.12	952.08	1812	1826	JA
22	742574	50.12	1002.2	1837	1900	RAS
23	742574	50.15	1052.35	1912	1927	RAS
24	742570	50.1	1102.45	1937	1951	RAS
25	10833000	50.1	1152.55	2000	2018	RAS
26	10833000	50.05	1202.6	2026	2041	RAS
27	10833000	50.08	1252.68	2053	2109	RAS
28	742570	50.03	1302.71	2125	2139	RAS
29	742583	50.05	1352.76	2150	2206	RAS
30	30832820	50.12	1402.88	2216	2234	RAS
31	742584	50.03	1452.91	2251	2304	RAS
32	742584	50.01	1502.92	2317	2337	RAS
33	30832820	50.06	1552.98	2345	0010	RAS
34	742584	50.06	1603.04	0024	0041	RAS
35	742584	50.07	1653.11	0052	0113	RAS
36	30832820	50.05	1703.16	0125	0149	RAS
37	742577	50.08	1753.24	0200	0215	RAS
38	30832790	50.02	1803.26	0224	0246	RAS
39	742568	50.11	1853.37	0255	0316	RAS
40	742577	51.9	1905.27	0328	0356	RAS

CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 11/26 to 11/27/09

CASING DIAMETER: 42-inch

CASING DEPTH: 1075 ft bpl

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH	TIME		OBSERVER
				WELDING	LOWERING	
1	910809	11.58			1950	DL
2	933481	38.68	50.26	1956	2025	DL
3	920324	38.66	88.92	2054	2128	DL
4	910809	38.67	127.59	2153	2223	DL
5	933881	38.22	165.81	2250	2320	DL
6	910808	38.74	204.55	2344	2408	DL
7	933481	38.70	243.25	2428	0106	DL
8	933881	38.70	281.95	0123	0158	DL
9	1-9161	39.52	321.47	0240	0320	DL
10	1-9161	39.09	360.56	0355	0434	DL
11	1-9161	39.02	399.58	0536	0611	DL
12	1-9161	39.02	438.60	0745	0828	JA
13	1-9161	39.09	477.69	0840	0920	JA
14	742582	50.08	527.77	0934	1010	JA
15	742580	50.05	577.82	1015	1055	JA
16	742568	50.09	627.91	1115	1144	JA
17	742582	50.08	677.99	1150	1218	JA
18	742580	50.08	728.07	1228	1253	JA
19	742596	50.05	778.12	1300	1325	JA
20	742596	50.13	828.25	1330	1356	JA
21	742582	50.07	878.32	1401	1437	JA
22	742580	50.07	928.39	1450	1516	JA
23	742580	50.06	978.45	1525	1552	JA
24	742568	50.08	1028.53	1600	1624	JA
25	742582	51.88	1080.41	1636	1705	JA
				Casing Depth	1075 ft bpl	
				Floor+Elev	5.41 ft above pad	
				Total Casing	1080.41	

CASING TALLY SHEET		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 11/11/09
CASING DIAMETER: 52-inch	CASING DEPTH: 155 ft bpl	

PAGE: 1 of 1

DATE: 11/11/09

CASING DEPTH: 155 ft bpl

[illegible]

IW-2

FRP CASING TALLY SHEET DRAFT

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/31/10

CASING DIAMETER: 16-inch

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
1	110000171	29.70	29.70	1733	1753	JA
2	110000171	29.53	59.23	1810	1819	JA
3	110000171	29.26	88.49	1825	1830	RAS
4	110000171	26.69	115.18	1836	1841	RAS
5	110000171	29.77	144.95	1844	1848	RAS
6	110000171	29.70	174.65	1852	1856	RAS
7	110000171	29.73	204.38	1900	1903	RAS
8	110000171	29.69	234.07	1907	1911	RAS
9	110000171	29.69	263.76	1914	1917	RAS
10	110000171	29.05	292.81	1920	1924	RAS
11	110000171	29.72	322.53	1927	1931	RAS
12	110000171	29.72	352.25	1933	1937	RAS
13	110000171	29.10	381.35	1940	0708	MO
14	110000171	29.46	410.81	0712	0725	MO
15	110000171	29.70	440.51	0728	0730	MO
16	110000171	29.72	470.23	0733	0739	MO
17	110000171	26.65	496.88	0742	0745	MO
18	110000171	29.78	526.66	0748	0751	MO
19	110000171	29.78	556.44	0754	0756	MO
20	110000171	29.50	585.94	0758	0802	MO
21	110000171	29.57	615.51	0804	0807	MO
22	110000171	29.61	645.12	0811	0815	MO
23	110000171	29.69	674.81	0818	0821	MO
24	110000171	29.72	704.53	0824	0827	MO
25	110000171	29.64	734.17	0829	0832	MO
26	110000171	29.63	763.80	0833	0836	MO
27	110000171	29.69	793.49	0838	0840	MO
28	110000171	29.53	823.02	0844	0847	MO
29	110000171	29.70	852.72	0849	0853	MO
30	110000171	29.70	882.42	0855	0858	MO
31	110000171	29.59	912.01	0858	0902	MO
32	110000171	29.75	941.76	0904	0908	MO
33	110000171	29.72	971.48	0909	0913	MO
34	110000171	29.71	1001.19	0915	0919	MO
35	110000171	29.72	1030.91	0920	0924	MO

FRP CASING TALLY SHEET DRAFT

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 2 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/18/10

CASING DIAMETER: 16-inch FRP

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
36	110000171	29.41	1060.32	0925	0928	MO
37	110000171	29.72	1090.04	0929	0933	MO
38	110000171	29.25	1119.29	0935	0938	MO
39	110000171	29.31	1148.60	0941	0943	MO
40	110000171	29.57	1178.17	0945	0949	MO
41	110000171	29.62	1207.89	0951	0955	MO
42	110000171	29.80	1237.62	0956	0959	MO
43	110000171	29.64	1267.27	1000	1004	MO
44	110000171	29.72	1296.48	1006	1009	MO
45	110000171	29.73	1326.24	1011	1014	MO
46	110000171	29.65	1355.94	1016	1020	MO
47	110000171	29.21	1385.56	1022	1026	MO
48	110000171	29.76	1415.36	1028	1049	MO
49	110000171	29.70	1445.00	1058	1100	MO
50	110000171	29.61	1474.61	1102	1105	MO
51	110000171	29.62	1504.23	1106	1110	MO
52	110000171	29.65	1533.88	1111	1114	MO
53	110000171	29.69	1563.57	1118	1120	MO
54	110000171	29.49	1593.06	1123	1126	MO
55	110000171	29.52	1622.58	1127	1131	MO
56	110000171	29.68	1652.26	1133	1136	MO
57	110000171	29.73	1681.99	1137	1140	MO
58	110000171	29.20	1711.19	1143	1146	MO
59	110000171	29.57	1740.76	1148	1151	MO
60	110000171	29.28	1770.04	1153	1156	MO
61	110000171	29.20	1799.24	1158	1202	MO
62	110000171	29.69	1828.93	1203	1206	MO
63	110000171	29.55	1858.48	1208	1212	MO
64	110000171	29.71	1888.19	1214	1217	MO
65	110000171	29.56	1917.75	1218	1221	MO
66	110000171	29.08	1946.83	1224	1229	MO
67	110000171	29.00	1975.83	1230	1234	MO
68	110000171	29.52	2005.35	1300	1304	MO
69	110000171	29.71	2035.06	1305	1308	MO
70	110000171	29.67	2064.73	1310	1313	MO

FRP CASING TALLY SHEET DRAFT

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 3 of 3

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/31/10

CASING DIAMETER: 16-inch FRP

CASING DEPTH: 2933 ft bpl

CASING JOINT NUMBER	CERTIFICATE NO.	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
71	110000171	29.63	2094.36	1314	1317	MO
72	110000171	29.59	2123.95	1318	1322	MO
73	110000171	29.60	2153.55	1324	1327	MO
74	110000171	29.69	2183.24	1328	1332	MO
75	110000171	29.54	2212.78	1333	1336	MO
76	110000171	29.61	2242.39	1337	1341	MO
77	110000171	29.47	2271.86	1342	1346	MO
78	110000171	29.67	2301.53	1347	1351	MO
79	110000171	29.76	2331.29	1352	1355	MO
80	110000171	29.58	2360.87	1357	1400	MO
81	110000171	29.52	2390.39	1401	1405	MO
82	110000171	29.73	2420.12	1406	1410	MO
83	110000171	29.68	2449.80	1411	1415	MO
84	110000171	29.66	2479.46	1416	1420	MO
85	110000171	29.52	2508.98	1421	1425	MO
86	110000171	29.68	2538.66	1426	1431	MO
87	110000171	29.51	2568.17	1432	1436	MO
88	110000171	29.71	2597.88	1437	1441	MO
89	110000171	29.64	2627.52	1442	1446	MO
90	110000171	29.52	2657.04	1447	1451	MO
91	110000171	29.70	2686.74	1453	1457	MO
92	110000171	29.69	2716.43	1458	1503	MO
93	110000171	29.72	2746.15	1545	1559	MO
94	110000171	29.43	2775.58	1600	1604	MO
95	110000171	29.24	2804.82	1605	1609	MO
96	110000171	29.51	2834.33	1611	1615	MO
97	110000171	29.71	2864.04	1616	1621	MO
98	110000171	29.35	2893.39	1621	1625	MO
99	110000171	29.53	2922.92	1627	1632	MO
Note: Cam's number is 2928.						

CASING TALLY SHEET

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/20/10

CASING DIAMETER: 24 x 0.50 inch

CASING DEPTH: 2975 ft bpl

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	CENTRALIZERS (ft above seat)	OBSERVER
1	987467	79.55	79.55	-	830	3, 45, 78	JA
2	174265, 174265	64.78	144.33	840	910		JA
3	174265, 174265	41.00	185.33	919	942	184	JA
4	987467	39.32	224.65	952	1021		JA
5	974156	41.13	265.78	1030	1058	264	JA
6	987467	39.13	304.91	1104	1130		JA
7	987467	39.60	344.51	1135	1159	343	JA
8	974156	41.20	385.71	1206	1237		JA
9	974156	41.30	427.01	1247	1347	426	JA
10	08604903, 08604903	41.97	468.98	1355	1421		JA
11	08604903, 08604903	41.97	510.95	1430	1455	509	JA
12	08604903, 08604903	42.04	552.99	1500	1530		JA
13	974145	41.42	594.41	1540	1625	593	JA
14	974156	41.32	635.73	1630	1710		JA
15	987467	39.29	675.02	1715	1755	674	JA
16	987467	38.55	713.57	1800	1830		JA
17	987467	37.73	751.3	1922	1955	750	RAS
18	974156	40.98	792.28	2016	2039		RAS
19	974145	41.59	833.87	2047	2116	832	RAS
20	974145	40.19	874.06	2125	2157		RAS
21	08604903, 08604903	41.87	915.93	2207	2237	914	RAS
22	08604903, 08604903	41.76	957.69	2245	2317		RAS
23	08604903, 08604903	41.97	999.66	2329	2358	998	RAS
24	987467	39.62	1039.28	0008	0032		RAS
25	987467	39.90	1079.18	0043	0112	1078	RAS
26	974158	40.80	1119.98	0122	0151		RAS
27	974156	40.88	1160.86	0158	0233	1159	RAS
28	974156	40.30	1201.16	0241	0312		RAS
29	974156	41.27	1242.43	0319	0350	1200	RAS
30	987467	39.95	1282.38	0406	0436		RAS
31	987467	38.43	1320.81	0443	0511	1241	RAS
32	987467	39.66	1360.47	0522	0557		RAS
33	987467	39.88	1400.35	0608	0709	1319	JA

CASING TALLY SHEET

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 2 of 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/21/10

CASING DIAMETER: 24 x 0.50 inch

CASING DEPTH: 2975 ft bpl

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	CENTRALIZERS (ft above seat)	OBSERVER
34	987467	39.92	1440.27	0720	0740		JA
35	987467	38.34	1478.61	0745	0825	1477	JA
36	987467	38.11	1516.72	0835	0901		JA
37	987466	39.46	1556.18	0910	0942	1555	JA
38	10080559, 10080559, 10080559	70.80	1626.98	0952	1016		JA
39	174265, 10084052, 10084051	65.75	1692.73	1028	1110	1691	JA
40	174265, 10084051, 10080551	76.55	1769.28	1120	1154		JA
41	10084052, 174265, 10084052	67.40	1836.68	1204	1241	1835	JA
42	174265, 10084052, 10084052	72.93	1909.61	1310	1345		JA
43	10084051, 10084052, 10084051	74.05	1983.66	1355	1430	1982	JA
44	10084051, 10080551, 10084052	74.18	2057.84	1440	1524		JA
45	10084052, 10080552, 10080551	78.09	2135.93	1545	1615	2134	JA
46	10080559, 10080559, 10084052	73.27	2209.2	1625	1705		JA
47	10084052, 174265, 10084052	71.48	2280.68	1715	1755	2279	JA
48	174265, 10084052, 174265	77.40	2358.08	1805	1927		RAS
49	10080551, 174265, 10084051	74.33	2432.41	1947	2031	2431	RAS
50	10084052, 10084052, 10084052	78.10	2510.51	2046	2120		RAS
51	10084051, 174265, 10084051	80.73	2591.24	2130	2206	2590	RAS
52	174265, 10084051, 10084051	79.22	2670.46	2216	2306		RAS
53	10084051, 174265, 10080551	74.88	2745.34	2315	0006	2744	RAS
54	174265, 10080551, 10080551	76.82	2822.16	0024	0219		RAS
55	10084051, 174265, 10084052	76.10	2898.26	0234	0809	2897	JA
56	174265, 10084052, 10080559	74.43	2972.69	0820	0920		JA
57	174265	6	2978.69	0930	1050	2975	JA
Casing joints 55,56,57 landed on 03/24/2010. Floor level is 4 ft above pad level. Casing seat sits at 2974.69 ft bp							
Female of YBI packer (top) sitting at 2933.2 ft bpl.							
Joints with multiple heat numbers are multiple sticks previously welded together in the yard.							
Bottom 40 feet of casing coated with targuard.							

CASING TALLY SHEET

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 2

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 12/13/2010

CASING DIAMETER: 34 x 0.375 inch

CASING DEPTH: 1900 FT

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING TIME	LOWERING TIME	OBSERVER
1	742581	50.08	50.08		0531	RS
2	742581	50.06	100.14	0740	750	RM
3	742581	50.07	150.21	0805	0825	RM
4	742584	50.11	200.32	0843	0915	RM
5	742584	50.06	250.38	0925	0933	RM
6	742580	50.1	300.48	0942	0955	RM
7	742579	50.02	350.50	1004	1050	RM
8	742579	50.03	400.53	1100	1115	RM
9	742574	50.52	451.05	1130	1150	RM
10	742598	50.08	501.13	1158	1215	RM
11	742579	50.04	551.17	1224	1240	RM
12	742581	50.05	601.22	1253	1307	RM
13	742581	50.05	651.27	1315	1334	RM
14	742596	50.11	701.38	1343	1359	RM
15	742584	50.09	751.47	1412	1427	RM
16	742581	50.12	801.59	1435	1459	RM
17	742581	50.11	851.70	1503	1526	RM
18	742580	50.1	901.80	1533	1555	RM
19	742580	50.09	951.89	1601	1616	RM
20	742580	50.08	1001.97	1650	1703	RM
21	742574	50.11	1052.08	1713	1737	RM
22	742574	50.12	1102.20	1743	1756	RM
23	742568	50.1	1152.30	1810	1825	RAS
24	742575	50.07	1202.37	1830	1900	RAS
25	742579	50.08	1252.45	1905	1921	RAS
26	742568	50.12	1302.57	1930	1948	RAS
27	742568	50.1	1352.67	1957	2012	RAS
28	742568	50.09	1402.76	2018	2046	RAS
29	742584	50.06	1452.82	2054	2116	RAS
30	742581	50.09	1502.91	2125	2143	RAS
31	742581	50.09	1553.00	2151	2213	RAS
32	742596	50.14	1603.14	2221	2239	RAS
33	742584	50.04	1653.18	2246	2305	RAS
34	742584	50.06	1703.24	2313	2330	RAS
35	742568	50.12	1753.36	2339	2358	RAS
36	742581	50.07	1803.43	0001	0025	RAS
37	742580	50.05	1853.48	0030	0055	RAS
38	742568	51.8	1905.28	0101	0140	RAS
floor & elevator		-5.28	1900.00	feet bpl		

CASING TALLY SHEET

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.:

CASING DEPTH: 1075 ft bpl

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 42-inch

THICKNESS: 0.375-INCH

SITE LOCATION: Hialeah RO

DATE: 12-Dec-09

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	WELDING START TIME	LANDING TIME	OBSERVER
1	910809	23.96	23.96	na	na	na
2	742598	50.05	74.01	12/11/2009	0750	BJP
3	742597	50.06	124.07	0830	0850	BJP
4	742574	50.15	174.22	0909	0935	BJP
5	742598	50.04	224.26	945	1004	BJP
6	742568	50.05	274.31	1011	1030	BJP
7	742598	50.06	324.37	1038	1058	BJP
8	10833000	50.08	374.45	1106	1124	BJP
9	10833000	50.06	424.51	1130	1153	BJP
10	742568	50.08	474.59	1201	1225	BJP
11	10833000	50.09	524.68	1228	1245	BJP
12	742572	50.13	574.81	1255	1314	BJP
13	742598	50.12	624.93	1324	1357	BJP
14	742572	50.10	675.03	1403	1440	BJP
15	742574	50.00	725.03	1446	1509	BJP
16	742572	50.10	775.13	1518	1536	BJP
17	742572	50.14	825.27	1540	1600	BJP
18	742598	50.12	875.39	1605	1632	BJP
19	742598	50.11	925.50	1635	1657	BJP
20	933491	38.05	963.55	1707	1724	BJP
21	933480	38.69	1002.24	1731	1752	BJP
22	933486	38.72	1040.96	1805	1832	BJP
23	910798	39.50	1080.46	1841	2000	RS
Note: Floor height is 5.41; casing total depth is 1075.05 ft bpl						
Centralizers installed every 100 feet at the top of each even numbered						

CASING TALLY SHEET		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 11/20/09
CASING DIAMETER: 52-inch	CASING DEPTH: 154.85 ft bpl	

PAGE: 1 of 1

DATE: 11/20/09

CASING DEPTH: 154.85 ft bpl

[illegible]

DZMW-1

CASING TALLY SHEET

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 3

SITE: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 4/30/2010

CASING DIAMETER: 6.625 x 0.34 inch

CENTERLINE OF PACKER: 2191 FT BPL

CASING JOINT NUMBER	JOB NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
Packer CL		4.00	4.00	-	1154	JA
1	100000194	29.61	33.61	1142	1154	JA
2	100000194	29.61	63.22	1210	1213	JA
3	100000194	29.61	92.83	1215	1218	JA
4	110000176	29.55	122.38	1221	1225	JA
5	110000176	29.54	151.92	1227	1230	JA
6	110000176	29.56	181.48	1232	1236	JA
7	110000176	29.55	211.03	1239	1242	JA
8	110000176	29.55	240.58	1244	1246	JA
9	110000176	29.55	270.13	1250	1300	JA
10	110000176	29.54	299.67	1302	1307	JA
11	110000176	29.54	329.21	1400	1402	JA
12	110000176	29.53	358.74	1405	1411	JA
13	110000176	29.54	388.28	1413	1416	JA
14	110000176	29.54	417.82	1418	1420	JA
15	110000176	29.53	447.35	1435	1438	JA
16	110000176	29.48	476.83	1440	1446	JA
17	110000176	29.49	506.32	1448	1454	JA
18	110000176	29.48	535.80	1456	1459	JA
19	110000176	29.49	565.29	1501	1504	JA
20	110000176	29.48	594.77	1505	1509	JA
21	110000176	29.49	624.26	1511	1513	JA
22	110000176	29.34	653.60	1515	1518	JA
23	110000176	29.49	683.09	1520	1522	JA
24	110000176	29.48	712.57	1524	1527	JA
25	110000176	29.48	742.05	1529	1531	JA
26	110000176	29.48	771.53	1533	1535	JA
27	110000176	29.47	801.00	1537	1539	JA
28	110000176	29.47	830.47	1541	1544	JA
29	110000176	29.46	859.93	1546	1549	JA
30	110000176	29.36	889.29	1551	1554	JA
31	110000176	29.48	918.77	1556	1558	JA
32	110000176	29.49	948.26	1600	1601	JA
33	110000176	29.49	977.75	1603	1604	JA
34	110000176	29.49	1007.24	1606	1607	JA

CASING TALLY SHEET

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 2 of 3

SITE: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 4/30/2010

CASING DIAMETER: 6.625 x 0.34 inch

CENTERLINE OF PACKER: 2191 FT BPL

CASING JOINT NUMBER	JOB NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
35	110000176	29.49	1036.73	1609	1610	JA
36	110000176	29.49	1066.22	1612	1614	JA
37	110000176	29.48	1095.70	1616	1617	JA
38	110000176	29.48	1125.18	1619	1622	JA
39	110000176	29.48	1154.66	1624	1628	JA
40	100000194	29.47	1184.13	1810	1812	JA
41	110000176	29.49	1213.62	1814	1817	JA
42	110000176	29.50	1243.12	1819	1821	JA
43	110000176	29.47	1272.59	1823	1825	JA
44	110000176	29.48	1302.07	1827	1829	JA
45	110000176	29.48	1331.55	1831	1833	JA
46	110000176	29.48	1361.03	1837	1845	DL
47	100000151	29.58	1390.61	1850	1852	DL
48	100000151	29.59	1420.20	1854	1856	DL
49	100000151	29.59	1449.79	1858	1900	DL
50	100000151	29.60	1479.39	1902	1903	DL
51	100000151	29.58	1508.97	1906	1912	DL
52	100000151	29.60	1538.57	1915	1917	DL
53	100000151	29.59	1568.16	1919	1921	DL
54	100000151	29.58	1597.74	1923	1925	DL
55	100000151	29.59	1627.33	1926	1928	DL
56	100000151	29.58	1656.91	1930	1962	DL
57	100000151	29.58	1686.49	1934	1935	DL
58	100000151	29.58	1716.07	1937	1939	DL
59	110000113	29.53	1745.60	1941	1943	DL
60	100000151	29.57	1775.17	1945	1947	DL
61	110000023	29.55	1804.72	1950	1952	DL
62	100000151	29.58	1834.30	1954	1956	DL
63	100000151	29.56	1863.86	1958	2000	DL
64	100000151	29.59	1893.45	2002	2203	DL
65	100000151	29.59	1923.04	2005	2007	DL
66	110000113	29.52	1952.56	2010	2012	DL
67	100000151	29.58	1982.14	2014	2016	DL
68	100000151	29.57	2011.71	2018	2019	DL

CASING TALLY SHEET		
WELL: DZMW-1	PROJECT NO.: 004-0122	PAGE NO.: 3 of 3
SITE: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 4/30/2010
CASING DIAMETER: 6.625 x 0.34 inch	CENTERLINE OF PACKER: 2191 FT BPL	

PAGE NO.: 3 of 3

DATE: 4/30/2010

CENTERLINE OF PACKER: 2191 FT BPL

CASING JOINT NUMBER	JOB NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH (feet)	CONNECTION TIME	LOWERING TIME	OBSERVER
69	100000151	29.59	2041.30	2022	2023	DL
70	110000113	29.52	2070.82	2026	2028	DL
71	110000113	29.53	2100.35	2032	2034	DL
72	110000113	29.53	2129.88	2037	2039	DL
73	110000113	29.22	2159.10	2042	2044	DL
74	110000082	29.48	2188.58	2046	2048	DL
SS Header		3	2191.58	2050	2130	DL

couplers and shortening total length of casing string.

[illegible]

CASING TALLY SHEET

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 2

SITE LOCATION: Hialeah RO PERMIT NO.: 0289249-001-UC

DATE: 17 April 2010

CASING DIAMETER: 12.75 x 0.375 inch

CASING DEPTH: 1900 FT

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH	WELDING TIME	LOWERING TIME	OBSERVER
1	3066991	40.22	40.22			DAB
2	3051723	40.17	80.39	0759	0823	DAB
3	73-04103	42.07	122.46	0834	0850	DAB
4	1066924	40.24	162.70	0857	0920	DAB
5	3051721	40.32	203.02	0927	0943	DAB
6	2051571	40.20	243.22	0951	1010	DAB
7	3051681	40.24	283.46	1017	1033	DAB
8	73-04103	42.08	325.54	1040	1058	DAB
9	3051721	40.25	365.79	1106	1126	DAB
10	3066951	40.18	405.97	1135	1152	DAB
11	3051721	40.37	446.34	1159	1218	DAB
12	3051641	40.30	486.64	1230	1245	DAB
13	3051723	40.17	526.81	1253	1310	DAB
14	73-04103	42.10	568.91	1319	1335	DAB
15	3066951	40.18	609.09	1343	1401	DAB
16	3051661	40.15	649.24	1408	1429	DAB
17	1066924	40.34	689.58	1438	1459	DAB
18	3051661	40.33	729.91	1506	1524	DAB
19	3051641	40.18	770.09	1532	1548	DAB
20	2051571	40.28	810.37	1557	1613	DAB
21	3051723	40.23	850.60	1620	1625	DAB
22	3051641	40.23	890.83	1644	1706	DAB
23	2067031	40.23	931.06	1714	1724	DAB
24	2051571	40.27	971.33	1740	1758	DAB
25	73-04103	39.02	1010.35	1805	1822	DAB
26	3066991	40.20	1050.55	1844	1924	RAS
27	3051681	40.23	1090.78	1933	1948	RAS
28	3051601	40.23	1131.01	1957	2013	RAS
29	2051571	40.27	1171.28	2020	2038	RAS
30	73-04103	42.06	1213.34	2043	2102	RAS
31	73-04103	42.09	1255.43	2109	2126	RAS
32	3066991	40.17	1295.60	2132	2152	RAS
33	2051571	40.19	1335.79	2156	2225	RAS
34	2051571	40.23	1376.02	2229	2247	RAS

CASING TALLY SHEET

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 2 of 2

SITE LOCATION: Hialeah RO PERMIT NO.: 0289249-001-UC

DATE: 17 April 2010

CASING DIAMETER: 12.75 x 0.375 inch

CASING DEPTH: 1900FT

CASING JOINT NUMBER	HEAT NUMBER	CASING JOINT LENGTH	CUMULATIVE LENGTH	WELDING TIME	LOWERING TIME	OBSERVER
35	3051681	40.25	1416.27	2251	2313	RAS
36	3051681	40.31	1456.58	2318	2333	RAS
37	3051681	40.24	1496.82	2340	2357	RAS
38	3066991	40.13	1536.95	0004	0024	RAS
39	73-04103	42.09	1579.04	0030	0057	RAS
40	3066951	40.18	1619.22	0103	0128	RAS
41	3051661	40.33	1659.55	0135	0200	RAS
42	3066951	40.32	1699.87	0206	0221	RAS
43	2051571	40.23	1740.10	0229	0249	RAS
44	2051571	40.25	1780.35	0255	0312	RAS
45	2051571	40.33	1820.68	0318	0340	RAS
46	73-04103	42.06	1862.74	0351	0410	RAS
47	73-04103	42.08	1904.82	0417	0444	RAS
	minus	Stickup+Floor	1899.95			
Centralizers at	20	1699.87				
(ft from	40.22	1820.68				
bottom of	122.46					
casing)	203.02					
	325.54					
	405.97					
	486.64					
	609.09					
	689.58					
	810.37					
	890.83					
	1010.35					
	1090.78					
	1171.28					
	1255.43					
	1335.79					
	1416.27					
	1496.82					
	1619.22					

[illegible]

[illegible]

Appendix I

YOUNGQUIST BROTHERS, INC.

Has Received This Shop Drawing/Submittal

YBI/Section No# 02854

Date: 12-16-2009

Signature: [Signature]

TITAN AMERICA

2009 NOV 25 PM 1:25



11000 N.W. 121 WAY
Mecley, Florida

Consignee _____ Destination _____
Date For the period of 10-1-2009 to 10-30-2009 Car/Truck _____
Batch # 2009-106009 Type IN Plant _____
Slots 1,8,10,11,12

CHEMICAL REQUIREMENTS	Average Percent		SPECIFICATION			
			AASHTO	M-85-07	ASTM	C-150-07
			TYPE I	TYPE II	TYPE I	TYPE II
Silicon Dioxide (SiO ₂) %	20.02	MIN %				
Aluminum Oxide (Al ₂ O ₃) %	5.22	MAX %		6.0		6.0
Iron Oxide (Fe ₂ O ₃) %	4.11	MAX %		0.0		6.0
Calcium Oxide (CaO) %	64.02					
Magnesium Oxide (MgO) %	0.91	MAX %	0.0	6.0	6.0	6.0
Sulfur Trioxide (SO ₃) When 3CaO.Al ₂ O ₃ < 8% %	3.17	MAX %	3.0	3.0	3.0	3.0
Sulfur Trioxide (SO ₃) When 3CaO.Al ₂ O ₃ > 8% %	0.34	MAX %	3.5		3.5	
Ignition Loss %	1.95	MAX %	3.0	3.0	3.0	3.0
Insoluble Residue %	0.34	MAX %	0.75	0.75	0.75	0.75
CO ₂ (%)	0.85					
Limestone (%)	2.4%					
CaCO ₃ in Limestone (%)	82.18					
Tricalcium Silicate (C3S) %		MAX %		58		58
Tricalcium Silicate (C3S) % Corrected for Limestone content	54					
Tricalcium Aluminate (C3A) %	7	MAX %		8		8
C3S + 4.75 C3A %	81	MAX %			100	100
Na ₂ O Equivalent %	0.34	MAX %	0.60	0.60	0.60	0.60
PHYSICAL REQUIREMENTS						
BLAINE CM ² /GRM	3953	MIN	2800	2800	2800	2800
		MAX	4000	4000	4200	4200
Paste False Set %	90	MIN	60	60	60	60
Soundness, Autoclave expansion %	0.01	MAX	0.80	0.80	0.80	0.80
- 325 MESH % Passing	99.7					
7 days Heat of Hydration (cal/g) FDOT Std Spec 921	79					80
AIR CONTENT %	5.7	MAX	12	12	12	12
Time of set (Vicat) Initial (Minutes)	90	MIN	45	46	45	45
Time of set (Vicat) Final (Minutes)	201	MAX	375	375	375	375
Compressive Strength, 1 Day (psi)	2275					
Compressive Strength, 3 Day (psi)	3808	MIN	1740	1450	1740	1450
Compressive Strength, 7 Day (psi)	4762	MIN	2760	2470	2760	2470
Compressive Strength, 28 D (psi) (prev. month)	6539					

This Mill Certificate covers cement in this shipment and all future shipments with this batch number.
This cement conforms to ASTM C-150-07 and AASHTO M-85-07 for Type I and Type II.
It also conforms to the Florida Department of Transportation Standard Specifications Section 921.
This cement may contain up to 5% limestone addition.
Optimum SO₃ per ASTM C-563 is in excess of 3.0. ASTM C-1038 provides compliance up to 3.5%
The cement covered by this Mill Certificate has been produced in the United States including the manufacturing of the clinker

Date 11/2/2009

[Signature]
Quality Manager

IW-1

CEMENT HOTSHOT LOG
CEMENT PLUG SET - 24-INCH CASING

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 03/09/10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (g/cm ³)	CUBIC FEET PUMPED	SACKS PUMPED
0121	preflush	0.0	2.0	8.3	1.0	0.0	0.0
0127	preflush	11.9	stop	8.3	1.0	66.6	0
0131	neat w 3% CaCl	0.0	0.3	14.7	1.8	0.0	0.0
0138	neat w 3% CaCl	2.0	stop	14.7	1.8	11.2	8.9
0142	chase	0.0	2.0	8.3	1.0	0	0
0148	chase	11.9	NA	8.3	1.0	66.6	0
Wait for first shot of cement to cure. No tag at 2970 ft bpl.							
0555	neat w 3% CaCl	0.0	0.7	15.0	1.8	0.0	0.0
0558	neat w 3% CaCl	2.0	stop	15	1.8	11.2	9.1
0600	chase	0	3.8	8.3	1.0	0.0	0
0603	chase	11.4	stop	8.3	1.0	63.8	0
Wait for second shot of cement to cure. 0854 tag at 2970 ft bpl. Set tremie at 2967							
0900	preflush	0.0	4.0	8.3	1.0	0.0	0.0
0904	preflush	15.9	stop	8.3	1.0	89.0	0
0927	neat w 3% CaCl	0.0	1.0	14.5	1.7	0.0	0
0930	neat w 3% CaCl	3.0	stop	14.5	1.7	16.8	13.2
0931	chase	0.0	2.7	8.3	1.0	0.0	0
0937	chase	15.9	stop	8.3	1.0	89.0	0.0
Wait for third shot of cement to cure. 1224 tag at 2967 ft bpl. Set t							
1226	preflush	0.0	2.0	8.3	1.0	0.0	0.0
1227	preflush	2.4	stop	8.3	1.0	13.4	0.0
1237	neat w 3% CaCl	0.0	1.0	14.3	1.7	0.0	0.0
1240	neat w 3% CaCl	3.0	stop	14.3	1.7	16.8	13.1
1241	chase	0.0	1.7	8.3	1.0	0.0	0.0
1247	chase	11.9	stop	8.3	1.0	66.6	0.0
Wait for forth shot of cement to cure. 1416 tag at 2967 ft bpl, no lift. Set tremie at 2966 ft bpl.							
1425	preflush	0.0	1.0	8.3	1.0	0.0	0.0
1435	preflush	10.0	stop	8.3	1.0	56.0	0.0
1454	neat w 3% CaCl	0.0	1.5	15.2	1.8	0.0	0.0
1456	neat w 3% CaCl	3.0	stop	15.2	1.8	16.8	13.9
1457	chase	0.0	1.7	8.3	1.0	0.0	0.0
1504	chase	11.9	stop	8.3	1.0	66.7	0.0
Wait for fifth shot fo cement to cure. 1720 tag at 2967 ft bpl no lift. Set tremie 2966 ft bpl.							

<p align="center">CEMENT HOTSHOT LOG</p> <p align="center">CEMENT PLUG SET - 24-INCH CASING</p>		
WELL: IW-2	PROJECT NO.: 004-0122	PAGE NO.: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 03/09/10
CASING DIAMETER: 24-inch	CASING THICKNESS: 0.5-inch	

PAGE NO.: 1 of 1

DATE: 03/09/10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE No 1

PAGE NO.: 1 of 1

DATE: 10 MAR 10

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (g/cm³)	CUBIC FEET PUMPED	SACKS PUMPED
0300	preflush	0	10	8.3	1.0	0	0
0301	preflush	10	stop	8.3	1.0	56	0
0304	neat	0	start	NA	NA	0	0
0310	neat	25	5.2	15.7	1.9	140	119.4
0314	neat	50	5.3	15.7	1.9	280	238.8
0319	neat	75	5.3	15.6	1.9	420	355.9
0324	neat	100	stop	15.6	1.9	560	474.6
0324	chase	0	4	4	1.0	0	0
0327	chase	13	stop	stop	1.0	73	0
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
2.2	cf 12% mix/sack						

CEMENT STAGE No 2

PAGE NO.: 1 of 1

DATE: 2010 03 10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE LOG

CEMENT STAGE No 3

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 2010 03 11

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (g/cm³)	CUBIC FEET PUMPED	SACKS PUMPED
0014	preflush	0	2.5	8.3	1.0	0	0
0016	preflush	5	stop	8.3	1.0	28	0
0018	neat	0	4	15.6	1.9	0	0
0021	neat	12	5	15.6	1.9	67	57
0024	neat	25	stop	15.6	1.9	140	119
stop pumping and pull a single							
0027	6% gel	0	5	13.7	1.7	0	0
0032	6% gel	25	5	13.7	1.7	140	119
0037	6% gel	50	5	13.8	1.7	280	200
0042	6% gel	75	5	13.7	1.7	420	281
0047	6% gel	100	4.9	13.7	1.7	560	362
0052	6% gel	125	5	13.7	1.7	700	443
0056	6% gel	141	stop	13.7	1.7	790	494
0056	chase	0	4	8.3	1.0	0	0
0059	chase	11.5	stop	8.3	1.0	64	0
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack			1.73	of 6% mix / sack		
2.2	cf 12% mix/sack						

CEMENT STAGE No 4

PAGE NO.: 1 of 1

DATE: 2010 03 11

CASING THICKNESS: 0.5-inch

note: Chased in tremie only, line between tanker and tremie was removed.

Conversion factors

5.6 cf/bbl

1.73 cf 6%/sack

CEMENT STAGE No 5

PAGE NO.: 1 of 1

DATE: 2010 03 12

CASING THICKNESS: 0.5-inch

1.73 cf 6%/sack

CEMENT STAGE No 6

PAGE NO.: 1 of 1

DATE: 2010 03 12

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE No 7

PAGE NO.: 1 of 1

DATE: 2010 03 12

CASING THICKNESS: 0.5-inch

Pull 2 stands + single and pups

[illegible]

CEMENT STAGE No 8

PAGE NO.: 1 of 1

DATE: 2010 03 12

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2030	preflush	0	5	8.3	1.0	0	n/a
2031	preflush	5	5	8.3	1.0	28	n/a
2051	3%CaCl ₂ *	0	5.2	15.6	1.9	0	0
2053	3%CaCl ₂	12	5.2	15.6	1.9	67	57
2057	3%CaCl ₂	30	5.2	15.6	1.9	168	142
2057	chase	0	5	8.3	1.0	0	n/a
2059	chase	10.75	5	8.3	1.0	60	n/a
Pull 3 stands + 10-ft pup, then reflush with 3 bbls water.							
Conversion factors							
5.6	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						
* "hot neat"							

CEMENT STAGE No 9

PAGE NO.: 1 of 1

DATE: 2010 03 12

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2318	preflush	0	5	8.3	1.0	0	n/a
2319	preflush	5	5	8.3	1.0	28	n/a
2321	3%CaCl2*	0	5.4	15.6	1.9	0	0
2324	3%CaCl2	15	5.4	15.6	1.9	84	71
2327	3%CaCl2	30	5.4	15.6	1.9	168	142
2327	chase	0	5	8.3	1.0	0	n/a
2329	chase	10.50	5	8.3	1.0	59	n/a
Pull 2.5 stands, then reflush with 3 bbls water.							
Conversion factors							
5.6	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						
* "hot neat"							

CEMENT STAGE LOG

CEMENT STAGE No 10

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 2010 03 13

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0153	preflush	0	5	8.3	1.0	0	n/a
0154	preflush	5	5	8.3	1.0	28	n/a
0156	6%	0	5.3	13.4	1.6	0	0
0158	6%	12	5.3	13.4	1.6	67	39
0201	6%	25	5.4	13.5	1.6	140	81
0206	6%	50	5.4	13.5	1.6	280	162
0211	6%	75.00	5.4	13.6	1.6	420	243
0216	6%	100	5.0	13.6	1.6	560	324
	Pull pup and one single						
0218	Resume pumping						
0224	6%	125	5.0	13.5	1.6	700	405
0229	6%	150	5.0	13.6	1.6	840	486
0234	6%	175	5.0	13.4	1.6	980	566
	Pull one single						
0237	Resume pumping						
0241	Shut cement pumper down to clear squeeze valve						
0243	Resume pumping						
0245	6%	200	5.0	13.5	1.6	1120	647
0249	Pull one single.						
0251	Resume pumping						
0253	6%	222	5.0	13.5	1.6	1243	719
0253	chase	0	5.0	8.3	1.0	0	n/a
0255	chase	9	5.0	8.3	1.0	50	n/a
	Pull 8 stands, reflush with 9 bbls water.						
Conversion factors							
5.6	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE No 11

PAGE NO.: 1 of 1

DATE: 2010 03 13

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1417	preflush	0	5	8.3	1.0	0	n/a
1419	preflush	6	5	8.3	1.0	34	n/a
1420	6%	0	5.4	13.5	1.6	0	0
1423	6%	12	5.4	13.5	1.6	67	39
1425	6%	25	5.4	13.5	1.6	140	81
1430	6%	50	5.4	13.6	1.6	280	162
1434	6%	75	5.4	13.4	1.6	420	243
1439	6%	100	5.4	13.5	1.6	560	324
1444	6%	125	5.5	13.5	1.6	700	405
1448	6%	150	5.5	13.5	1.6	840	486
1450	6%	157	5.5	13.5	1.6	879	508
1450	chase	0	5	8.3	1.0	0	n/a
1452	chase	8.5	5	8.3	1.0	48	n/a
Pull single, pups and 6 stands and reflush with 5 bbls							
Conversion factors							
5.6	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE LOG

CEMENT STAGE No 12

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 2010 03 14

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0200	preflush	0	5	8.3	1.0	0	n/a
0201	preflush	5	5	8.3	1.0	28	n/a
0204	6%	0	5.7	13.5	1.6	0	0
0206	6%	12	5.7	13.5	1.6	67	39
0208	6%	25	5.8	13.5	1.6	140	81
0213	6%	50	5.8	13.6	1.6	280	162
0217	6%	75	5.7	13.5	1.6	420	243
0221	6%	100	5.8	13.5	1.6	560	324
0225	6%	125	5.8	13.4	1.6	700	405
0229	6%	150	5.8	13.5	1.6	840	486
0234	6%	175	5.8	13.6	1.6	980	566
0238	6%	200	5.8	13.5	1.6	1120	647
0243	6%	225	5.8	13.5	1.6	1260	728
0247	6%	250	5.8	13.4	1.6	1400	809
0249	6%	260	5.8	13.4	1.6	1456	842
0249	chase	0	5	8.3	1	0	n/a
0250	chase	9	5	8.3	1	50	n/a
Pull 12 stands, a single and the pups, then reflush with water.							
Conversion factors							
5.6	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE LOG

CEMENT STAGE No 13

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 3/14/10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1437	preflush	0	5	8.3	1.0	0	n/a
1438	preflush	5	5	8.3	1.0	28	n/a
1439	6%	0	6	13.5	1.6	0	0
1442	6%	12	6	13.5	1.6	67	39
1444	6%	25	6	13.6	1.6	140	81
1449	6%	50	6	13.4	1.6	281	162
1453	6%	75	6	13.5	1.6	421	243
1457	6%	100	6	13.5	1.6	561	324
1501	6%	125	6	13.5	1.6	701	405
1505	6%	150	6	13.5	1.6	842	486
1509	6%	175	6	13.4	1.6	982	567
1513	6%	200	6	13.4	1.6	1122	649
1517	6%	225	6	13.6	1.6	1262	730
1522	6%	250	6	13.6	1.6	1403	811
1526	6%	275	6	13.5	1.6	1543	892
1528	6%	285	6	13.5	1.6	1599	924
1528	chase	0	5	8.3	1.0	0	n/a
1529	chase	5	5	8.3	1.0	28	n/a
Pull 12 stands, pups, then reflush with water.							
Conversion factors							
5.61	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE LOG

CEMENT STAGE No 14

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 3/15/10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0200	preflush	0	5	8.3	1.0	0	n/a
0201	preflush	5	5	8.3	1.0	28	n/a
0203	6%	0	6	13.5	1.6	0	0
0205	6%	12	6	13.5	1.6	67	39
0208	6%	25	6	13.5	1.6	140	81
0212	6%	50	6	13.6	1.6	281	162
0216	6%	75	6	13.5	1.6	421	243
0220	6%	100	6	13.6	1.6	561	324
0224	6%	125	6	13.5	1.6	701	405
0228	6%	150	6	13.6	1.6	842	486
0233	6%	175	6	13.6	1.6	982	567
0237	6%	200	6	13.6	1.6	1122	649
0241	6%	225	6	13.5	1.6	1262	730
0245	6%	250	6	13.5	1.6	1403	811
0249	6%	275	6	13.5	1.6	1543	892
2054	6%	301	6	13.5	1.6	1689	976
0254	chase	0	5	8.3	1.0	0	n/a
0255	chase	3	5	8.3	1.0	17	n/a
Pull all stands and rinse out tubing.							
Conversion factors							
5.61	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE LOG

CEMENT STAGE No 15

WELL: IW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 3/17/10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1618	preflush	0	5	8.3	1.0	0	n/a
1619	preflush	4	5	8.3	1.0	22	n/a
1621	6%	0	6	13.5	1.6	0	0
1624	6%	12	6	13.5	1.6	67	39
1626	6%	25	6	13.4	1.6	140	81
1630	6%	50	6	13.5	1.6	281	162
1634	6%	75	6	13.6	1.6	421	243
1639	6%	100	6	13.5	1.6	561	324
1643	6%	125	6	13.5	1.6	701	405
1647	6%	150	6	13.6	1.6	842	486
1651	6%	175	6	13.5	1.6	982	567
1651	chase	0	5	8.3	1.0	0	n/a
1652	chase	2	5	8.3	1.0	11	n/a
Pull all stands, clean up to pit							
Conversion factors							
5.61	cf/bbl						
1.73	cf 6%/sack						
1.18	cf neat/sack						

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 1 (pressure grout)

DATE: December 28, 2009

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
1049	preflush	0	start	0	8.3	0	0
1049:30	preflush	5	finish	0	8.3	28	0
1051:22	12%	0	start	0	12.7	0	0
1056:30	12%	26	5.5	3	12.7	146	66
1100:45	12%	50	5.5	10	12.6	280	128
1105:40	12%	76	5.2	20	12.8	426	194
1109:50	12%	100	5.2	28	12.6	560	255
1115:15	12%	127	5.2	36	12.7	711	324
1117:10	12%	150	5.2	43	12.7	840	383
1124:15	12%	175	5.2	50	12.7	980	446
1124:15	neat	175	5.2	50	15.7	980	446
1131:40	neat	207	4.2	60	15.7	1159	597
1137:45	neat	239	4.9	75	15.7	1338	748
1142:45	neat	260	5.0	92	15.6	1456	848
1146:08	neat	275	4.2	108	15.7	1540	920
1150:39	neat	296	finish	130	15.7	1658	1020
1151:30	chase	0	start	142	8.3	0	0
1053:30	chase	10	finish	160	8.3	56	0
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 2 (tremie)

DATE: December 29, 2009

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
0509	preflush	0	start	150	8.3	0	0
0510	preflush	5	finish	150	8.3	28	0
0511	12%	0	start	150	12.7	0	0
0514	12%	11	5.5	150	12.7	62	28
0517	12%	30	5.6	150	12.6	168	76
0521	12%	50	5.6	150	12.7	280	127
0525	12%	75	5.6	150	12.7	420	191
0526	12%	80	stop	150	NA	448	204
0530	12%	80	resume	150	NA	448	204
0534	12%	101	5.5	150	12.8	566	257
0536	12%	110	stop	150	NA	616	280
0539	12%	110	resume	150	NA	616	280
0545	12%	130	5.8	150	12.8	728	331
0549	12%	155	5.8	150	12.6	868	395
0551	12%	165	stop	150	NA	924	420
0554	12%	165	resume	150	NA	924	420
0558	12%	187	finish	150	12.7	1047	476
0558	chase	0	start	150	8.3	0	0
0559	chase	6.75	finish	150	8.3	38	0
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 3 (tremie)

DATE: December 29, 2009

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
1931	preflush	0	start	125	8.3	0	0
1932	preflush	5	finish	125	8.3	28	0
1933	12%	0	start	135	NA	0	0
1936	12%	10	5.4	135	12.5	56	25
1938	12%	25	5.4	135	12.7	140	64
1943	12%	50	5.4	135	12.7	280	127
1948	12%	75	5.4	135	12.6	420	191
1952	12%	100	5.4	135	12.6	560	255
1952	12%	100	Stop	135	NA	560	255
1956	12%	100	resume	135	NA	560	255
2001	12%	125	5.5	140	12.6	700	318
2005	12%	150	5.5	140	12.6	840	382
2007	12%	160	finish	140	12.6	896	407
2007	chase	0	Start	140	8.3	0	0
2009	chase	6.5	finish	140	8.3	36	0
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 4 (tremie)

DATE: December 30, 2009

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
0757:00	preflush	0	start	143	8.3	0	0
0759:00	preflush	5	finish	143	8.3	28	0
0759:00	12%	0	start	143	NA	0	0
0802:00	12%	10	5.5	143	12.7	56	25
0804:30	12%	25	5.5	143	12.7	140	64
0809:20	12%	50	5.5	143	12.5	280	127
0814:00	12%	75	5.5	143	12.5	420	191
0816:50	12%	93	stop	144	12.5	521	237
Pull one cement tremie stand, flow from annulus stopped.							
0824:45	12%	93	resume	145	12.5	521	237
0830:35	12%	125	5.5	146	12.7	700	318
0835:15	12%	150	5.5	147	12.7	840	382
0840:00	12%	175	stop	148	12.5	980	445
Pull one cement tremie single.							
0843:00	12%	175	start	149	12.5	980	445
0847:30	12%	200	5.5	151	12.6	1120	509
0848:50	12%	206	finish	151	12.6	1154	524
0849:00	chase	0	start	151	8.3	0	0
0850:00	Chase	5.5	Finish	151	8.3	31	0
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 5 (tremie)

DATE: December 30, 2009

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
1957	preflush	0	start	200	8.3	0	0
1958	preflush	5	finish	200	8.3	28	0
2000	12%	0	start	200	12.6	0	0
2005	12%	25	5.5	200	12.6	140	64
2010	12%	50	stop	200	12.6	280	127
2013	12%	50	resume	200			
2018	12%	75	5.5	200	12.6	420	191
2023	12%	100	stop	200	12.8	560	255
2027	12%	100	resume	200			
2032	12%	125	5.5	200	12.6	700	318
2037	12%	150	stop	200	12.6	840	382
2039	12%	150	resume	200			
2044	12%	175	5.5	200	12.6	980	445
2049	12%	200	stop	200	12.6	1120	509
2052	12%	200	resume	200			
2057	12%	225	5.5	200	12.6	1260	573
2102	12%	250	5.5	200	12.6	1400	636
2106	12%	274	stop	200	12.6	1534	697
2106	chase	0	Start	200	8.3	0	0
2107	chase	4	stop	200	8.3	22	0
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 34-inch

STAGE: 6 (tremie)

DATE: December 31, 2009

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
1139	Preflush	0	Start	197	8.3	0	0
1140	Preflush	5	Finish	197	8.3	28	0
1156:10	12%	0	Start	195	12.7	0	0
1159:00	12%	10	5.5	195	12.7	56	25
1201:00	12%	25	5.5	194	12.7	140	64
1206:00	12%	50	Stop	194	12.7	280	127
1207	Remove single and pup.						
1210:10	12%	50	Start	194	12.7	280	127
1214:30	12%	75	5.5	195	12.8	420	191
1219:20	12%	100	Stop	196	12.8	560	255
1220	Remove double.						
1223:20	12%	100	Resume	197	12.8	560	255
1227:50	12%	125	5.5	198	12.8	700	318
1232:25	12%	150	Stop	200	12.8	840	382
1234	Remove double.						
1235:30	12%	150	Resume	200	12.8	840	382
1240:20	12%	175	5.5	199	12.6	980	445
1244:40	12%	200	Stop	201	12.6	1120	509
1245	Remove double.						
1248:00	12%	200	Resume	202	12.6	1120	509
1252:40	12%	225	5.5	201	12.6	1260	573
1257:10	12%	250	5.5	200	12.6	1400	636
1301:55	12%	275	5.5	201	12.6	1540	700
1306:40	Start seeing cement returns at surface.						
1308:00	12%	296	Finish	200	12.6	1658	753
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG	
WELL: IW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 42-inch	STAGE: 1 (pressure grout)
DATE: 11/28/09	

PROJECT NO.: 0044-0122

PERMIT NO.: 0289249-001-UC

STAGE: 1 (pressure grout)

DATE: 11/28/09

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
0104	preflush	0	0	0	8.3	0	NA
0108	preflush	15	3.8	0	8.3	84	NA
0110	12%	0	0	0	12.7	0	0
0114	12%	24	6.5	9	12.7	134	61
0119	12%	52	6.2	12	12.7	291	132
0126	12%	100	6.5	22	12.8	560	255
0135	12%	154	6.5	50	12.7	862	392
0143	12%	203	6.2	60	12.6	1137	517
0153	12%	262	6.2	82	12.6	1467	667
0201	neat	312	6	105	15.6	1747	904
0213	neat	380	6	132	15.6	2128	1227
0215	chase	8	4	125	8.3	22	NA
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG

WELL: IW-1

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 42-inch

STAGE: 2

DATE: 11/29/09

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
0010	preflush	0	NA	NA	8.3	0	NA
0012	preflush	15	7.5	NA	8.3		NA
0014	12%	0	NA	NA	NA	0	0
0022	12%	50	6.7	NA	12.7	280	127
0029	12%	100	7.1	NA	12.6	560	255
0035	12%	150	7.5	NA	12.7	840	382
Pull one stand							
0040	Resume pumping	150	NA	NA	NA	840	382
0046	12%	200	7.0	NA	12.6	1120	509
0053	12%	250	7.2	NA	12.7	1400	636
0100	12%	300	7.2	NA	12.6	1680	764
Pull one stand							
0150	Resume pumping	300	NA	NA	NA	1680	764
0112	12%	350	7.0	NA	12.8	1960	891
0119	12%	400	7.5	NA	12.6	2240	1018
0126	12%	425	3.2	NA	12.7	2380	1082
0134	12%	450	3.4	NA	12.7	2520	1145
0136	12%	461	NA	NA	12.7	2582	1173
Cement in returns							
1.18 ft ³ of neat cement per sack							
2.2 ft ³ of 12% mix per sack							

CEMENT STAGE LOG	
WELL: IW-1	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52-inch	STAGE: 1 (pressure grout)
DATE: 11/11/09	

PROJECT NO.: 0044-0122

PERMIT NO.: 0289249-001-UC

STAGE: 1 (pressure grout)

[illegible]

IW-2

CEMENT STAGE No 1

PAGE NO.: 1 of 1

DATE: 26 MAR 10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE LOG

CEMENT STAGE No 2

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 27 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1002	preflush	0	3	8.3	1.0	0	n/a
1005	preflush	10	3	8.3	1.0	56	n/a
1008	neat	0	start	n/a	n/a	0	0
1011	neat	13	5	15.6	1.9	73	61.7
1013	neat	25	5	15.6	1.9	140	118.6
1018	neat	50	5	15.5	1.9	280	235.8
1023	neat	75	5	15.7	1.9	420	358.2
1028	neat	100	5	15.6	1.9	560	474.6
1031	neat	112	go to chase	15.6	1.9	627	531.5
1031	chase	0	start	8.3	1.0	0	n/a
1033	chase	12	6	8.3	1.0	67	n/a
Pull 3 stands and pups and reflush							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
2.2	cf 12% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 3

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 27 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2040	preflush	0	5	8.3	1.0	0	n/a
2042	preflush	10	5	8.3	1.0	56	n/a
2050	neat	0	5	15.6	1.9	0	0
2052	neat	12	5	15.6	1.9	67	57
2055	neat	25	5	15.6	1.9	140	119
Take off the three pup joints and switch to 6 percent mix.							
2100	Resume pumping						
2105	6%	50	5	13.5	1.6	280	200
2110	6%	75	5	13.5	1.6	420	281
2117	6%	109	5	13.5	1.6	610	391
2117	chase	0	5	8.3	1.0	0	n/a
2120	chase	11.5	5	8.3	1.0	64	n/a
Pull 5 stands of cement tubing. Wait for cement to harden.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 9% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 4

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 28 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0841	preflush	0	5	8.3	1.0	0	n/a
0843	preflush	10	5	8.3	1.0	56	n/a
0845	6% gel	0	start	n/a	n/a	0	0
0848	6% gel	12	5.1	13.4	1.6	67	39
0850	6% gel	25	5.1	13.4	1.6	140	81
0855	6% gel	50	5.0	13.5	1.6	280	162
0900	6% gel	75	5.1	13.5	1.6	420	243
0905	6% gel	100	go to chase	n/a	n/a	560	324
0905	chase	0	5	8.3	1.0	0	n/a
0907	chase	11	5	8.3	1.0	62	n/a
Pull pups and 5 stands and reflush with water.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 5

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 28 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2151	preflush	0	5	8.3	1.0	0	na
2153	preflush	8	5	8.3	1.0	45	na
2155	6%	0	5	13.5	1.6	0	0
2158	6%	12	5	13.5	1.6	67	39
2201	6%	25	5	13.5	1.6	140	81
2205	6%	50	5	13.6	1.6	280	162
2211	6%	77	5	13.6	1.6	431	249
2211	chase	0	5	8.3	1.0	0	na
2213	chase	11	5	8.3	1.0	60	na
Pull the pup and 4 stands, wait for cement to harden.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE No 6

PAGE NO.: 1 of 1

DATE: 29 MAR 10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE LOG

CEMENT STAGE No 7

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 29 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1258	preflush	0	5	8.3	1.0	0	n/a
1259	preflush	5	5	8.3	1.0	28	n/a
1301	3%CaCl2	0	start	15.6	1.9	0	0
1304	3%CaCl2	15	5	15.6	1.9	84	71
1307	3%CaCl2	30	go to chase	15.6	1.9	168	142
1307	chase	0	5	8.3	1.0	0	n/a
1309	chase	11	5	8.3	1.0	60	n/a
Pull pups and two doubles and reflush							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 8

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 29 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1523	preflush	0	5	8.3	1.0	0	n/a
1524	preflush	5	5	8.3	1.0	28	n/a
1526	3%CaCl2	0	start	15.7	1.9	0	0
1530	3%CaCl2	15	5	15.7	1.9	84	71
1532	3%CaCl2	30	go to chase	15.7	1.9	168	142
1533	chase	0	5	8.3	1.0	0	n/a
1535	chase	11	5	8.3	1.0	60	n/a
Pull two doubles and reflush							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE No 9

PAGE NO.: 1 of 1

DATE: 29 MAR 10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE LOG

CEMENT STAGE No 10

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 29 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1936	preflush	0	5	8.3	1.0	0	na
1937	preflush	5	5	8.3	1.0	28	na
1941	3%CaCl2	0	5	15.6	1.9	0	0
1944	3%CaCl2	15	5	15.6	1.9	84	71
1947	3%CaCl2	30	5	15.6	1.9	168	142
1947	chase	0	5	8.3	1.0	0	na
1949	chase	10.5	5	8.3	1.0	59	na
Pull pups and two stands of cement tubing. Wait for cement to cure.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE No 11

PAGE NO.: 1 of 1

DATE: 29 MAR 10

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2240	preflush	0	5	8.3	1	0	na
2241	preflush	5	5	8.3	1	28	na
2243	6% mix	0	5	13.5	1.6	0	0
2245	6% mix	12	5.3	13.5	1.6	67	39
2248	6% mix	25	5.3	13.4	1.6	140	81
2253	6% mix	50	5.3	13.4	1.6	280	162
2257	6% mix	75.0	5.3	13.5	1.6	420	243
2302	6% mix	100	5.3	13.5	1.6	560	324
2306	6% mix	120	5.3	13.5	1.6	672	388
2306	chase	0	5	8.3	1	0	na
2308	chase	9.5	5	8.3	1	53	na
Pull five stands of cement tubing and wait for cement to cure.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 12

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 30 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
1046	preflush	0	5	8.3	1	0	n/a
1047	preflush	5	5	8.3	1	28	n/a
1050	6% gel	0	5.5			0	0
1053	6% gel	12	5.5	13.5	1.6	67	39
1055	6% gel	25	5.5	13.5	1.6	140	81
1100	6% gel	50	5.5	13.6	1.6	280	162
1104	6% gel	75	5.5	13.7	1.7	420	243
1108	6% gel	100	Stop			560	324
Pull pups and one single							
1112	6% gel	100	Resume			560	324
1117	6% gel	125	5.5	13.6	1.6	700	405
1121	6% gel	150	5.5	13.5	1.6	840	486
1125	6% gel	172	Stop			963	557
Showing weight. Pull one double.							
1129	6% gel	172	Resume			963	557
1130	6% gel	175	5.5			980	566
1130	chase	0	5	8.3	1	0	0
1132	chase	8.75	5	8.3	1	49	28
Pull five more doubles and reflush.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG

CEMENT STAGE No 13

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 30 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2131	preflush	0	5	8.3	1	0	na
2140	preflush	5	5	8.3	1	28	na
2147	6% mix	0	0	13.5	1.6	0	0
2149	6% mix	12	5.5	13.5	1.6	67	39
2152	6% mix	25	5.5	13.5	1.6	140	81
2156	6% mix	50	5.5	13.4	1.6	280	162
2201	6% mix	75	5.5	13.5	1.6	420	243
2205	6% mix	100	5.5	13.5	1.6	560	324
	Pull one stand of cement tubing.						
2208	Resume pumping.						
2213	6% mix	125	5.5	13.5	1.6	700	405
2218	6% mix	150	5.5	13.6	1.6	840	486
2222	6% mix	175	5.5	13.7	1.6	980	566
2227	6% mix	200	5.5	13.4	1.6	1120	647
	Tubing starting to stick, pull one stand.						
2233	Resume pumping.						
2235	6% mix	225	5.5	13.5	1.6	1260	728
2242	6% mix	260	5.5	13.5	1.6	1456	842
2242	chase	0	5	8.3	1	0	na
2244	chase	7.25	5	8.3	1	41	na
	Pull pups, one single, and 10 stands of cement tubing. Wait for cement to cure.						
Conversion factors							
5.6	cf/bbl						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG**CEMENT STAGE No 14**

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 31 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0909	preflush	0	5	8.3	1.0	0	n/a
0910	preflush	5	5	8.3	1.0	28	n/a
0912	6% gel	0	6.0	-	-	0	0
0915	6% gel	12	6.1	13.5	1.6	67	39
0917	6% gel	25	6.1	13.5	1.6	140	81
0921	6% gel	50	6.1	13.5	1.6	280	162
0925	6% gel	75	6.1	13.4	1.6	420	243
0929	6% gel	100	6.1	13.4	1.6	560	324
0933	6% gel	125	6.1	13.4	1.6	700	405
0937	6% gel	150	6.1	13.6	1.6	840	486
0941	6% gel	175	6.1	13.6	1.6	980	566
0946	6% gel	200	6.1	13.5	1.6	1120	647
0950	6% gel	225	6.1	13.5	1.6	1260	728
0954	6% gel	250	6.1	13.4	1.6	1400	809
0958	6% gel	275	6.1	13.4	1.6	1540	890
1002	6% gel	300	6.1	13.5	1.6	1680	971
1005	6% gel	320	6.1	13.5	1.6	1792	1036
1005	chase	0	5	8.3	1.0	0	n/a
1006	chase	5	5	8.3	1.0	28	n/a
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE LOG**CEMENT STAGE No 15**

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 31 MAR 10

CASING DIAMETER: 24-inch

CASING THICKNESS: 0.5-inch

TIME	MIX	BBLs PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
2051	preflush	0	5	8.3	1	0	na
2052	preflush	5	5	8.3	1	28	na
2054	6% mix	0	6.5	13.5	1.6	0	0
2056	6% mix	12	6.5	13.5	1.6	67	39
2058	6% mix	25	6.5	13.5	1.6	140	81
2101	6% mix	50	6.5	13.5	1.6	280	162
2105	6% mix	75	6.5	13.6	1.6	420	243
2109	6% mix	100	6.5	13.5	1.6	560	324
2113	6% mix	125	6.5	13.5	1.6	700	405
2117	6% mix	150	6.5	13.4	1.6	840	486
2121	6% mix	175	6.5	13.5	1.6	980	566
2124	6% mix	200	6.5	13.3	1.6	1120	647
2128	6% mix	225	6.5	13.5	1.6	1260	728
2132	6% mix	250	6.5	13.5	1.6	1400	809
2136	6% mix	275	6.5	13.4	1.6	1540	890
2140	6% mix	300	6.5	13.4	1.6	1680	971
2143	6% mix	325	6.5	13.5	1.6	1820	1052
2145	6% mix	338	6.5	13.5	1.6	1893	1094
2145	chase	0	5	8.3	1	0	na
2146	chase	2.75	5.0	8.3	1	15	na
Pull all cement tubing, wait for cement to cure.							
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
1.73	cf 6% mix/sack						

CEMENT STAGE No 16

PAGE NO.: 1 of 1

DATE: 02 APR 10

CASING THICKNESS: 0.5-inch

[illegible]

CEMENT STAGE LOG		
WELL: IW-2	PROJECT NO.: 0044-0122	OBSERVER:
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	D.Barnes
BOREHOLE DIAMETER: 40.5-inch	STAGE: 1 (pressure grout)	
CASING SIZE: 34x0.375-inch	DATE: 01/13/10	

OBSERVER:

D. Barnes

DATE: 01/13/10

[illegible]

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
BOREHOLE DIAMETER: 40.5-inch	STAGE: 2
CASING SIZE: 34x0.375-inch	DATE: 01/14/10

PROJECT NO.: 0044-0122

PERMIT NO.: 0289249-001-UC

STAGE: 2

DATE: 01/14/10

[illegible]

CEMENT STAGE LOG		
WELL: IW-2	PROJECT NO.: 0044-0122	OBSERVER:
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	D.Barnes
BOREHOLE DIAMETER: 40.5-inch	STAGE: 3	
CASING SIZE: 34x0.375-inch	DATE: 01/14/10	

OBSERVER:

D. Barnes

STAGE: 3

DATE: 01/14/10

[illegible]

CEMENT STAGE LOG		
WELL: IW-2	PROJECT NO.: 0044-0122	OBSERVER:
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	R. Stross &
BOREHOLE DIAMETER: 40.5-inch	STAGE: 4	D. Barnes
CASING SIZE: 34x0.375-inch	DATE: 01/15/10	

OBSERVER:

R. Stross &

D. Barnes

DATE: 01/15/10

[illegible]

CEMENT STAGE LOG

CEMENT STAGE No 5

WELL: IW-2

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 01/15/10

CASING DIAMETER: 34-inch

CASING THICKNESS: 0,375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
1752	preflush	0	5.0	140	8.3	0	na
1753	preflush	5	5.0	140	8.3	28	na
1755	12%	0	7.0	140	12.6	0	0
1759	12%	25	7.0	150	12.6	140	64
1803	12%	50	7.0	160	12.6	280	127
1810	12%	181	7.0	180	12.7	1014	461
1817	12%	150	7.0	200	12.6	840	382
1824	12%	200	6.0	200	12.7	1120	509
1835	12%	265	6.5	200	12.7	1484	675
1841	12%	301	6.1	200	12.7	1686	766
1844	12%	323	7.0	200	12.7	1809	822
1845	chase	0	4.0	200	8.3	0	na
1846	chase	4	4.0	200	8.3	22	na
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						
2.2	cf 12% mix/sack						

CEMENT STAGE No 6

PAGE NO.: 1 of 1

DATE: 01/16/10

CASING THICKNESS: 0.375-inch

[illegible]

CEMENT STAGE LOG

WELL: IW-2

PROJECT NO.: 0044-0122

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CASING DIAMETER: 42-inch

STAGE: 1 (pressure grout)

DATE: 12/13/09

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	CASING PRESSURE (PSI)	WEIGHT (LBS/GAL)	CUBIC FEET PUMPED	SACKS PUMPED
0233	preflush	0	NA	NA	8.3	NA	NA
0234	preflush	10	10	NA	8.3	560	NA
0234	12% gel	0	NA	NA	NA	NA	NA
0239	12% gel	25	7	11	12.5	140	64
0243	12% gel	50	7	15	12.6	280	127
0246	12% gel	75	7	19	12.6	420	191
0250	12% gel	100	7	26	12.5	560	255
0253	12% gel	125	7	36	12.7	700	318
0257	12% gel	150	7	40	12.6	840	382
0301	12% gel	175	7	43	12.6	980	445
0304	12% gel	200	7	52	12.6	1120	509
0308	12% gel	225	6	60	12.8	1260	573
0313	12% gel	250	5.7	72	12.5	1400	636
0316	12% gel	275	5.7	77	12.6	1540	700
0321	12% gel	300	5.8	82	12.7	1680	764
0325	12% gel	325	5.8	90	12.5	1820	827
0329	12% gel	350	5.8	96	12.7	1960	891
0333	12% gel	375	5.7	108	12.5	2100	955
0337	12% gel	400	5.7	112	12.6	2240	1018
0341	12% gel	425	5.7	116	12.8	2380	1082
0344	12% gel	450	5.7	120	12.8	2520	1145
0349	neat	475	5.7	122	15.5	2660	1264
0352	neat	500	5.7	126	15.6	2800	1382
0356	neat	525	5.7	132	15.7	2940	1501
0400	neat	555	5.7	133	15.7	3108	1643
0400	chase	0	NA	133	8.3	NA	NA
0402	chase	7.5	7	133	8.3	42	NA

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

CEMENT STAGE LOG	
WELL: IW-2	PROJECT NO.: 0044-0122
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC
CASING DIAMETER: 52''	STAGE: 1 (pressure grout)
DATE: 11/20/09	

[illegible]

DZMW-1

CEMENT STAGE LOG		
STAGE 1		
WELL: DZMW-1	PROJECT NO.: 004-0122	PAGE NO.: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 05/01/10
CASING DIAMETER: 6.625-inch FRP	CASING THICKNESS: 0.34 inch	

[illegible]

CEMENT STAGE LOG		
STAGE 2		
WELL: DZMW-1	PROJECT NO.: 004-0122	PAGE NO.: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	DATE: 05/02/10
CASING DIAMETER: 6.625-inch FRP	CASING THICKNESS: 0.34 inch	

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED
0146	preflush	0	6	8.3	1.0	0	0
0147	preflush	5	stop	8.3	1.0	0	0
0151	neat	0	5	15.6	1.9	0	0
0152	neat	5	5	15.6	1.9	28	24
0153	neat	10	stop	15.6	1.9	56	47
0153	chase	0	6	8.3	1.0	0	0
0155	chase	5	stop	8.3	1.0	28	0
pull pups							
0157	chase	5	5	8.3	1.0	28	0
0158	chase	7	stop	8.3	1.0	39	0
pull single, getting sticky							
0201	chase	7	5	8.3	1.0	39	0
0202	chase	9	stop	8.3	1.0	52	0
Conversion factors							
5.6	cf/bbl						
1.18	cf neat cement/sack						

[illegible]

CEMENT STAGE No 1

PAGE NO.: 1 of 1

DATE: 18 APR 10

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
1515	preflush	0	5	8.3	1.0	0	0	n/a
1517	preflush	10	5	8.3	1.0	56	0	
1520	neat	0	5	15.6	1.9	0	0	
1522	neat	10	5	15.5	1.9	56	47	
1525	neat	25	5	15.6	1.9	140	119	
1526	neat	30	5	15.6	1.9	168	142	
Stop, pull pups								
1529	neat	30	5	15.6	1.9	168	142	
1531	neat	42	5	15.6	1.9	235	199	
Stop, pull double, got sticky								
1534	neat	42	5	15.6	1.9	235	199	
1536	neat	50	5	15.6	1.9	280	237	
1537	neat	51	5	15.6	1.9	286	242	
Stop, pull single, sticky								
1540	neat	51	5	15.6	1.9	286	242	
1541	neat	54	5	15.6	1.9	302	256	
1541	chase	0	5	8.3	1.0	0	0	
1542	chase	4	5	8.3	1.0	22	0	
Stop, pull single, sticky								
1544	chase	4	5	8.3	1.0	22	0	
1546	chase	7.75	5	8.3	1.0	43	0	
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
1.73	cf 6% mix/sack							

CEMENT STAGE LOG

CEMENT STAGE No 2

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 19 APR 10

CASING DIAMETER: 12.75-inch

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
0214	preflush	start	NA	8.3	1.0	NA	NA	NA
0216	preflush	5	3	8.3	1.0	28	NA	NA
0218	6%	start	NA	NA	NA	NA	NA	NA
0220	6%	10	5.2	13.4	1.6	56	32	NA
0223	6%	25	5.2	13.5	1.6	140	81	NA
0224	Pull single and pup							
0227	6%	resume	NA	NA	NA	NA	NA	NA
0228	6%	39	5	13.5	1.6	218.4	126.2	NA
0228	stop and pull single							
0231	6%	resume	NA	NA	NA	NA	NA	NA
0234	6%	47	4	13.5	1.6	263.2	152.1	NA
0234	stop and pull double							
0240	6%	resume	NA	NA	NA	NA	NA	NA
0241	6%	50	4	13.5	1.6	280.0	161.8	NA
0246	6%	75	4.5	13.5	1.6	420.0	242.8	NA
0247	stop and pull double							
0250	6%	resume	NA	NA	NA	NA	NA	NA
0254	6%	100	4.5	13.5	1.6	560.0	323.7	NA
0257	chase	start	NA	8.3	1.0	NA	NA	NA
0259	chase	6.5	4	8.3	1.0	36.4	NA	NA
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
1.73	cf 6% mix/sack							

CEMENT STAGE No 3

PAGE NO.: 1 of 1

DATE: 19 APR 10

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
1348	preflush	0		8.3	1.0	0	NA	NA
1349	preflush	5	5	8.3	1.0	28	NA	NA
1351	6% gel	0				0	0	NA
1353	6% gel	10	5.5	13.5	1.6	56	32	NA
1356	6% gel	25	5	13.5	1.6	140	81	NA
1358	6% gel	35				196	113	NA
Stop, pull one double								
1400	6% gel	35				196	113	NA
1403	6% gel	50	5.7	13.5	1.6	280	162	NA
1407	6% gel	69				386	223	NA
Stop, pull single								
1409	6% gel	69				386	223	NA
1411	6% gel	75	5.7	13.6	1.6	420	243	NA
1414	6% gel	95				532	308	NA
Stop, pull single								
1417	6% gel	95				532	308	NA
1418	6% gel	100	5.8	13.5	1.6	560	324	NA
1421	6% gel	115				644	372	NA
1421	chase	0		8.3	1.0	0	NA	NA
1422	chase	5.75	5	8.3	1.0	32	NA	NA
Stop, pull 7 doubles and reflush								
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
1.73	cf 6% mix/sack							

CEMENT STAGE No 4

PAGE NO.: 1 of 1

DATE: 20 APR 10

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
0214	preflush	start	NA	8.3	1.0	NA	NA	NA
0215	preflush	5	5	8.3	1.0	28	NA	NA
0217	6% gel	start	NA	NA	NA	NA	NA	NA
0219	6% gel	10	5	13.6	1.6	56	32	NA
0222	6% gel	25	6	13.5	1.6	140	81	NA
0226	6% gel	50	6	13.5	1.6	280	162	NA
0226	stop, pull pups and single							
0230	6% gel	66	4	13.5	1.6	370	214	NA
0233	stop, pull double							
0237	6% gel	start	NA	NA	NA	NA	NA	NA
0239	6% gel	75	6	13.5	1.6	420	243	NA
0243	6% gel	100	6	13.5	1.6	560	324	NA
0243	stop, pull double							
0246	6% gel	start	NA	NA	NA	NA	NA	NA
0250	6% gel	120	5	13.5	1.6	672	388	NA
0250	chase	start	NA	8.3	1.0	NA	NA	NA
0251	chase	4.5	5	8.3	1.0	25	NA	NA
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
1.73	cf 6% mix/sack							

CEMENT STAGE No 5

PAGE NO.: 1 of 1

DATE: 4/20/10

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (-)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
1333	preflush	0	5	8.3	1.0	0	NA	NA
1334	preflush	4	5	8.3	1.0	22	NA	
1336	6% gel	0				0	0	
1338	6% gel	10	6	13.5	1.6	56	32	
1340	6% gel	25	6	13.5	1.6	140	81	
1344	6% gel	50				280	162	
Stop, pull two doubles								
1350	6% gel	50				280	162	
1354	6% gel	75	6.0	13.5	1.6	420	243	
1358	6% gel	100				560	324	
Stop, pull two doubles								
1403	6% gel	100				560	324	
1407	6% gel	125	6.0	13.7	1.7	700	405	
1411	6% gel	150				840	486	
Stop, pull three doubles								
1419	6% gel	150				840	486	
1424	6% gel	175	6.0	13.5	1.6	980	566	
1427	6% gel	189	Surface			1058	612	
1427	chase	0	5	8.3	1.0	0	NA	
1428	chase	2	5	8.3	1.0	11	NA	
Cement at surface. Stop, pull out, clean up.								
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
1.73	cf 6% mix/sack							

CEMENT STAGE LOG

CEMENT STAGE No 1

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 07 APR 10

CASING DIAMETER: 20-inch

CASING THICKNESS: 0.375-inch

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	SPECIFIC GRAVITY (g/cm³)	CUBIC FEET PUMPED	SACKS PUMPED	CASING PRESSURE (PSI)
0559	preflush	0	4	8.3	1.0	0	0	0
0602	preflush	10	stop	8.3	1.0	56	0	0
0604	12%	0	6	12.6	1.5	0	0	0
0610	12%	25	6	12.6	1.5	140	64	13
0613	12%	50	6	12.6	1.5	280	127	22
0617	12%	75	6	12.5	1.5	420	191	37
0622	12%	100	6	12.5	1.5	560	255	56
0626	12%	125	6	12.7	1.5	700	318	71
0630	12%	150	6	12.7	1.5	840	382	84
0634	12%	175	6	12.7	1.5	980	445	102
0638	12%	200	6	12.5	1.5	1120	509	118
0643	12%	225	6	12.6	1.5	1260	573	130
0648	12%	250	6	12.6	1.5	1400	636	146
0652	12%	275	6	12.6	1.5	1540	700	157
0656	12%	300	6	12.7	1.5	1680	764	162
0700	12%	325	6	12.6	1.5	1820	827	170
0700	neat	325	6	15.6	1.9	1820	827	170
0704	neat	350	6	15.6	1.9	1960	946	180
0708	neat	375	6	15.6	1.9	2100	1065	190
0712	neat	400	6	15.6	1.9	2240	1183	200
0716	neat	425	6	15.6	1.9	2380	1302	210
0718	neat	441	stop	15.6	1.9	2470	1378	220
0718	chase	0	4	8.3	1.0	0	0	220
0720	chase	8	stop	8.3	1.0	45	0	225
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
2.2	cf 12% mix/sack							

CEMENT STAGE LOG

PRESSURE GROUT

WELL: DZMW-1

PROJECT NO.: 004-0122

PAGE NO.: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: 29 MAR 10

CASING DIAMETER: 30-inch

CASING THICKNESS: 0.375-inch

Depth: 157 ft bpl

TIME	MIX	BBLS PUMPED	RATE (BBL/MIN)	WEIGHT (LBS/GAL)	CASING PRESSURE (PSI)	SPECIFIC GRAVITY (g/cm³)	CUBIC FEET PUMPED	SACKS PUMPED
0114	preflush	0	6	8.3		1	0	0
0115	preflush	5.5	6	8.3		1	31	0
0120	12%	0	6	12.6	0.0	1.5	0	0
0124	12%	25	6	12.6	5.0	1.5	140	64
0127	12%	45	6	12.6	10.0	1.5	252	115
0129	neat	50	6	15.4	11.0	1.9	280	138
0133	neat	75	6	15.6	13.0	1.9	420	257
0137	neat	100	6	15.5	17.0	1.9	560	376
0141	neat	125	6	15.5	25.0	1.9	700	494
0145	neat	145	6	15.5	28.0	1.9	812	589
0149	neat	172	6	15.5	32.0	1.9	963	717
0149	chase	0	6	8.3	30.0	1	0	0
0150	chase	4	6	8.3	30.0	1	22	0
Conversion factors								
5.6	cf/bbl							
1.18	cf neat cement/sack							
2.2	cf 12% mix/sack							

5 28 23.72881

Appendix J

IW-1

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 12.25-inch diameter pilot hole 1100 to 2156 ft bpl.		

PAGE: 1

CONTRACTOR: YOUNGQUIST

PHASE: 12.25-inch diameter pilot hole 1100 to 2156 ft bpl.

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST

PAGE: 1 of

CONTRACTOR: YOUNGQUIST

PHASE: 12.25-inch diameter pilot hole to 1,100 ft bpl.

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 12.25-inch pilot hole	INTERVAL: 1990 to 3400 ft.	

PAGE: 1

CONTRACTOR: YOUNGQUIST

INTERVAL: 1990 to 3400 ft.

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 32.5 inch ream	INTERVAL: 1900 to 3500 ft.	

PAGE: 1

CONTRACTOR: YOUNGQUIST

INTERVAL: 1900 to 3500 ft.

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 40.5-inch diameter reamed borehole		

PAGE: 1

CONTRACTOR: YOUNGQUIST

[illegible]

RECORDED BY

RAS

JA

RAS

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RAS

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RAS

RAS

BDL

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 50-inch nominal diameter reamed borehole		

PAGE: 1

CONTRACTOR: YOUNGQUIST

PHASE: 50-inch nominal diameter reamed borehole

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 60.5-inch borehole from 0 to 160 bpl.		

PAGE: 1 of

CONTRACTOR: YOUNGQUIST

[illegible]

RECORDED BY

DL

IW-2

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 12.25-inch diameter pilot borehole		

PAGE: 1

CONTRACTOR: YOUNGQUIST

PHASE: 12.25-inch diameter pilot borehole

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 12.25-inch pilot hole to 3500 ft bpl		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 22.5-inch ream to 3500 ft bpl		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 32.5 inch ream to 2970 ft bpl		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 40.5-inch diameter reamed borehole		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 50-inch nominal diameter borehole		

PAGE: 1

CONTRACTOR: YOUNGQUIST

PHASE: 50-inch nominal diameter borehole

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 60.5-inch diameter borehole from 0 to 160 bpl.		

PAGE: 1 of 1

CONTRACTOR: YOUNGQUIST

PHASE: 60.5-inch diameter borehole from 0 to 160 bpl.

[illegible]

DZMW-1

INCLINATION SURVEY SUMMARY		
WELL: DZMW-1	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 11-inch diameter pilot hole 1900 to 2260 ft bpl.		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: DZMW-1	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 12.25-inch diameter pilot hole 1179 to 1890 ft bpl.		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL: DZMW-1	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 18.5-inch diameter borehole 1078 to 1800 ft bpl.		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY

WELL: DZMW-1

PROJECT NO.: 0044-0122

ENGINEER: SCHLUMBERGER

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CONTRACTOR: YOUNGQUIST

PHASE: 18.5-inch diameter borehole 1078 to 1800 ft bpl.

Page: 1 of 1

INCLINATION SURVEY SUMMARY		
WELL: DZMW-1	PROJECT NO.: 0044-0122	ENGINEER: SCHLUMBERGER
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 28.5-inch diameter borehole		Page: 1 of 1

ENGINEER: SCHLUMBERGER

CONTRACTOR: YOUNGQUIST

Page: 1 of 1

[illegible]

INCLINATION SURVEY SUMMARY		
WELL:DZMW-1	PROJECT NO.: 0044-0122	PAGE: 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CONTRACTOR: YOUNGQUIST
PHASE: 40.5 inch ream	INTERVAL: 0 to 161 ft.	

PAGE: 1

CONTRACTOR: YOUNGQUIST

INTERVAL: 0 to 161 ft.

[illegible]

Appendix K

WATER QUALITY ANALYSIS SUMMARY

REVERSE AIR DISCHARGE

WELL: IW-1			PROJECT NO: 0044-0122						Page 1 of 2
SITE LOCATION: Hialeah RO			PERMIT NO: 0289249-001-UC			CONTRACTOR: Youngquist			
DATE	TIME	DEPTH (ft)	FIELD ANALYSIS		LABORATORY ANALYSIS				RECORDED BY
			COND. (µmhos)	CHLORIDE (mg/l)	SPECIF. COND. (umhos)	CHLORIDE (mg/L)	AMMONIA (mg/L)	TKN (mg/L)	
12/01/09	2119	1130	1285	240	1260	220	0.06	0.47	BJP
12/01/09	2230	1160	1840	380	1780	400	0.62	1.0	BJP
12/01/09	2310	1190	1702	380	1640	380	0.38	0.82	BJP
12/02/09	0105	1220	1229	220	1170	230	0.05	0.45	BJP
12/02/09	0125	1250	1820	380	1740	410	0.05	0.85	BJP
12/02/09	0238	1280	1749	400	1600	370	0.50	0.92	BJP
12/02/09	0350	1320	1527	280	1420	300	0.28	1.0	BJP
12/02/09	0415	1340	1605	320	1490	320	0.16	0.63	BJP
12/02/09	2100	1350	1808	420	1690	400	0.35	0.81	RAS
12/02/09	2150	1380	1665	360	1660	390	0.23	0.71	RAS
12/03/09	0035	1410	1932	440	1820	450	0.12	0.44	RAS
12/03/09	0120	1440	1923	420	1780	450	0.26	0.58	RAS
12/03/09	0215	1470	1860	400	1690	430	0.22	0.57	RAS
12/03/09	0430	1500	1905	420	1720	440	0.16	0.51	RAS
12/03/09	0600	1530	2058	480	1870	500	0.12	0.44	RAS
12/03/09	0645	1560	2543	620	2320	640	0.14	0.48	BJP
12/03/09	0912	1590	2326	560	2130	590	0.11	0.77	BJP
12/03/09	1203	1620	2296	520	2100	560	0.07	0.53	BJP
12/03/09	1243	1650	2265	520	2130	550	0.04	0.69	BJP
12/03/09	1448	1680	2429	600	2360	610	0.04	6.0	BJP
12/03/09	1803	1710	5600	1600	5370	1580	0.31	2.1	RAS
12/03/09	1848	1740	2460	600	2340	600	0.04	0.45	RAS
12/03/09	2120	1770	3047	780	2840	790	0.04	0.39	RAS
12/03/09	2320	1800	2982	760	2790	770	0.04	0.42	RAS
12/04/09	0130	1830	3327	860	3080	890	0.03	0.56	RAS
12/04/09	0340	1860	3111	820	2920	810	0.03	1.1	BJP
12/04/09	0630	1890	3604	980	3400	950	0.04	0.59	BJP
12/04/09	0800	1920	3635	960	3440	970	0.08	0.64	BJP
12/04/09	1115	1950	4033	1100	3900	1120	0.05	0.58	BJP
12/04/09	1325	1980	5970	1800	4150	1200	0.011	0.29	BJP
12/04/09	1520	2010	5420	1500	5680	1740	0.03	0.31	BJP
12/04/09	1730	2040	5270	2600	5530	1660	<0.01	0.26	DL
12/04/09	2325	2070	7730	2500	8180	2600	0.10	0.31	DL
12/05/09	0110	2100	6060	1975	6340	1940	0.02	0.30	DL
12/05/09	1240	2130	6860	2050	4060	1160	0.02	0.55	BP
01/02/10	1150	2160	45,090	17,490	34,200	19,100	0.52	0.86	DB
01/02/10	1300	2190	44,910	16,611	34,100	17,500	0.42	0.80	DB

WATER QUALITY ANALYSIS SUMMARY
REVERSE AIR DISCHARGE

WELL: IW-1			PROJECT NO: 0044-0122						Page 2 of 2
SITE LOCATION: Hialeah RO			PERMIT NO: 0289249-001-UC			CONTRACTOR: Youngquist			
DATE	TIME	DEPTH (ft)	FIELD ANALYSIS		LABORATORY ANALYSIS				RECORDED BY
			COND. (µmhos)	CHLORIDE (mg/l)	SPECIF. COND. (umhos)	CHLORIDE (mg/L)	AMMONIA (mg/L)	TKN (mg/L)	
01/03/10	2115	2220	43,200	19,140	32,900	17,900	0.35	0.74	DL
01/03/10	2315	2250	141,500	68,760	106,400	71,700	0.88	1.1	DL
01/04/10	0130	2280	45,130	19,050	34,800	18,400	0.33	0.70	DL
01/06/10	0145	2310	70,400	34,200	68,000	31,000	0.33	0.75	DL
01/06/10	0735	2340	62,200	23,250	57,300	24,000	0.28	0.66	DB
01/06/10	0843	2370	63,100	28,500	57,900	24,500	0.27	0.64	DB
01/06/10	1230	2400	62,100	27,000	56,800	24,500	0.25	0.65	DB
01/06/10	1750	2430	61,400	23,000	55,000	23,500	0.20	0.55	DB
01/07/10	0330	2460	61,300	29,750	56,100	23,500	0.18	0.53	DL
01/07/10	1500	2490	51,200	18,450	47,900	19,500	<0.01	0.045	DL
01/10/10	0500	2520	NM	NM	46,600	20,400	<0.01	0.063	DL
01/10/10	1330	2550	NM	NM	45,700	21,200	<0.01	0.067	DL
01/10/10	2317	3580	NM	NM	45,800	20,200	<0.01	0.067	DL
01/11/10	0515	2610	NM	NM	46,300	20,000	<0.01	0.18	DL
01/11/10	0633	2640	NM	NM	45,900	19,600	<0.01	0.076	DL
01/11/10	1000	2670	NM	NM	52,900	19,154	<0.01	0.14	DL
01/11/10	1500	2700	NM	NM	52,600	19,865	<0.01	0.17	DL
01/12/10	2315	2730	NM	NM	51,000	18,759	<0.01	0.15	DL
01/13/10	0135	2760	NM	NM	51,500	19,306	<0.01	0.11	DL
01/13/10	0510	2790	NM	NM	51,400	19,411	<0.01	0.11	DL
01/13/10	1030	2820	NM	NM	52,700	19,931	<0.01	<0.045	DL
01/15/10	0130	2850	NM	NM	52,100	20,249	<0.01	0.22	DL
01/15/10	0330	2880	NM	NM	51,300	19,541	<0.01	0.20	DL
01/15/10	0415	2910	NM	NM	51,300	19,964	<0.01	0.20	DL
01/15/10	0718	2940	NM	NM	51,700	13,444	<0.01	0.11	DL
01/15/10	1000	2970	NM	NM	51,300	21,000	<0.01	0.44	DL
01/15/10	1230	3000	NM	NM	51,200	20,500	<0.01	0.23	DL
01/15/10	1650	3030	NM	NM	53,400	22,000	<0.01	0.27	DL
01/16/10	0415	3060	NM	NM	50,700	21,500	<0.01	0.14	DL
01/16/10	1030	3090	NM	NM	51,800	21,500	<0.01	0.10	DL
01/17/10	0145	3120	NM	NM	52,500	21,500	<0.01	<0.045	DL
10/17/10	1507	3150	NM	NM	53,400	22,000	<0.01	0.86	DL
01/18/10	0530	3180	NM	NM	53,600	22,000	<0.01	0.05	DL
01/18/10	2240	3210	NM	NM	53,600	22,000	<0.01	0.31	DL



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

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Report Printed: 04/29/10 Rev. 1
Submission # 1003000650
Order # 9792

Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Coliform-Total (E-Coli)	P(A)		-----			9223B	03/24 17:40	03/25 17:40	AMC
pH (field)	7.15		units	0.1	0.3	150.1	03/24 07:20	03/24 07:20	AP
531.1 Carbamate Pesticides: 62-550 (Unregulated)			Dilution Factor = 1						
Aldicarb Sulfoxide	U	U	ug/L	0.37	1.11	531.1	04/07 11:26	04/07 11:26	RPV
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	04/07 11:26	04/07 11:26	RPV
Methomyl	U	U	ug/L	0.26	0.78	531.1	04/07 11:26	04/07 11:26	RPV
3-Hydroxycarbofuran	U	U	ug/L	0.56	1.68	531.1	04/07 11:26	04/07 11:26	RPV
Aldicarb	U	U	ug/L	0.66	1.98	531.1	04/07 11:26	04/07 11:26	RPV
Carbaryl	U	U	ug/L	0.25	0.75	531.1	04/07 11:26	04/07 11:26	RPV
531.1 Carbamate Pesticides: 62-550.310(4)(b)			Dilution Factor = 1						
Carbofuran	U	U	ug/L	0.45	1.35	531.1	04/07 11:26	04/07 11:26	RPV
Oxamyl (Vydate)	U	U	ug/L	0.41	1.23	531.1	04/07 11:26	04/07 11:26	RPV
Glyphosate	U	U	ug/L	3.55	10.65	547	03/30 17:18	03/30 17:18	RPV
549.2 Diquat: 62-550.310(4)(b)			Dilution Factor = 1						
Diquat	U	U	ug/L	0.4	1.2	549.2	03/31 10:00	03/31 11:12	RPV
Chloride	22000		mg/L	77.50	232.50	300.0	03/25 17:00	03/25 17:00	DGK
Fluoride	1.82	I	mg/L	0.800	2.400	300.0	03/25 17:00	03/25 17:00	DGK
Nitrate (as N)	U	U	mg/L	0.100	0.300	300.0	03/25 17:00	03/25 17:00	DGK

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

Pembroke Laboratory
528 Gooch Rd.
Fort Mead, FL 33841

Big Lake Laboratory
415 B SW Park St.
Okeechobee, FL 34972

Spectrum Laboratories
630 Indian St.
Savannah, GA 31401

www.flenviro.com

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

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Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Nitrate + Nitrite (as N)	U	U	mg/L	0.120	0.360	300.0	03/25 17:00	03/25 17:00	DGK
Nitrite (as N)	U	U	mg/L	0.120	0.360	300.0	03/25 17:00	03/25 17:00	DGK
Sulfate	2770		mg/L	10.00	30.00	300.0	03/25 17:00	03/25 17:00	DGK
Cyanide, Total	U	U	mg/L	0.002	0.006	335.4	04/01 17:43	04/01 17:43	IMA
Color/pH (Lab)	5/7.74		Pt-Co	1.0	3.0	SM2120B	03/25 11:31	03/25 11:31	IMA
Odor (Lab) at 40 Degrees C	1		TON	1.0	3.0	SM2150B	03/24 17:43	03/24 17:43	RPV
Total Dissolved Solids (TDS)	35700		mg/L	1.00	3.00	SM 2540C	03/25 14:45	03/26 15:19	LYR
MBAS Surfactants	0.116		mg/L	0.033	0.099	SM5540C	03/25 15:40	03/25 15:40	DGK
Aluminum	0.029		mg/L	0.0007	0.0021	200.7	03/24	03/24 23:11	IMN
Copper	U	U	mg/L	0.0002	0.0006	200.7	03/24	03/24 23:11	IMN
Iron	0.078		mg/L	0.0008	0.0024	200.7	03/24	03/24 23:11	IMN
Manganese	0.006		mg/L	0.00009	0.00027	200.7	03/24	03/24 23:11	IMN
Silver	U	U	mg/L	0.0001	0.0003	200.7	03/24	03/24 23:11	IMN
Sodium	10518		mg/L	0.280	0.840	200.7	03/24	03/25 17:49	IMN
Zinc	0.023		mg/L	0.00050	0.00150	200.7	03/24	03/24 23:11	IMN
200.8 DW-10 Metals in Drinking Water 62-550.310				Dilution Factor = 10					
Arsenic	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Barium	0.0098		mg/L	0.00040	0.00120	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN

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Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Cadmium	U	U	mg/L	0.00080	0.00240	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Chromium	U	U	mg/L	0.0010	0.0030	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Lead	U	U	mg/L	0.00060	0.00180	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Nickel	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Selenium	U	U	mg/L	0.0090	0.0270	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Antimony	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Beryllium	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Thallium	U	U	mg/L	0.00004	0.00012	4.1.3/200.8	03/29 10:00	03/29 15:56	IMN
Mercury	U	U	mg/L	0.0001	0.0003	245.1	03/25	03/25 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	0.006	0.018	EPA 504.1 ECD	03/2510:30	03/25 14:59	DS
Ethylene Dibromide (EDB)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	03/2510:30	03/25 14:59	DS
508 Pesticides & PCBs: 62-550.310(4)(b)				Dilution Factor = 1					
Hexachlorocyclopentadiene	U	U	ug/L	0.015	0.045	508	03/26 10:00	03/29 11:05	DS
Hexachlorobenzene	U	U	ug/L	0.006	0.018	508	03/26 10:00	03/29 11:05	DS
v-BHC (Lindane)	U	U	ug/L	0.005	0.015	508	03/26 10:00	03/29 11:05	DS
Heptachlor	U	U	ug/L	0.002	0.006	508	03/26 10:00	03/29 11:05	DS
Heptachlor Epoxide	U	U	ug/L	0.002	0.006	508	03/26 10:00	03/29 11:05	DS

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Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Endrin	U	U	ug/L	0.005	0.015	508	03/26 10:00	03/29 11:05	DS
Methoxychlor	U	U	ug/L	0.005	0.015	508	03/26 10:00	03/29 11:05	DS
Arochlor 1016	U	U	ug/L	0.1	0.3	508	03/26 10:00	03/29 11:05	DS
Arochlor 1221	U	U	ug/L	0.02	0.06	508	03/26 10:00	03/29 11:05	DS
Arochlor 1232	U	U	ug/L	0.03	0.09	508	03/26 10:00	03/29 11:05	DS
Arochlor 1242	U	U	ug/L	0.02	0.06	508	03/26 10:00	03/29 11:05	DS
Arochlor 1248	U	U	ug/L	0.03	0.09	508	03/26 10:00	03/29 11:05	DS
Arochlor 1254	U	U	ug/L	0.02	0.06	508	03/26 10:00	03/29 11:05	DS
Arochlor 1260	U	U	ug/L	0.03	0.09	508	03/26 10:00	03/29 11:05	DS
Toxaphene	U	U	ug/L	0.21	0.63	508	03/26 10:00	03/29 11:05	DS
Chlordane	U	U	ug/L	0.03	0.09	508	03/26 10:00	03/29 11:05	DS
515.3 Chlorophenoxy Herbicides 62-550 (Reg)			Dilution Factor = 1						
Dalapon	U	U	ug/L	0.09	0.27	515.3	03/29 09:19	03/29 23:39	AC
2,4-D	U	U	ug/L	0.08	0.24	515.3	03/29 09:19	03/29 23:39	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	03/29 09:19	03/29 23:39	AC
2,4,5-TP (silvex)	U	U	ug/L	0.04	0.12	515.3	03/29 09:19	03/29 23:39	AC
Dinoseb	U	U	ug/L	0.11	0.33	515.3	03/29 09:19	03/29 23:39	AC
Picloram	U	U	ug/L	0.06	0.18	515.3	03/29 09:19	03/29 23:39	AC

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Matrix: Water

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Collected: 03/24/10 07:20
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
524.2 Trihalomethanes: 62-550.310(3) THMs									
				Dilution Factor = 1					
Bromodichloromethane	U	U	ug/L	0.25	0.75	524.2	03/25 12:42	03/25 12:42	MMD
Dibromochloromethane	U	U	ug/L	0.13	0.39	524.2	03/25 12:42	03/25 12:42	MMD
Tribromomethane (Bromoform)	U	U	ug/L	0.43	1.29	524.2	03/25 12:42	03/25 12:42	MMD
Trichloromethane (Chloroform)	U	U	ug/L	0.13	0.39	524.2	03/25 12:42	03/25 12:42	MMD
TOTAL Trihalomethanes	U		ug/L			524.2	03/25 12:42	03/25 12:42	MMD
524.2 Volatile Organics: 62-550.310(4)(a)									
				Dilution Factor = 1					
Vinyl Chloride	U	U	ug/L	0.31	0.93	524.2	03/25 12:42	03/25 12:42	MMD
1,1-Dichloroethylene	U	U	ug/L	0.18	0.54	524.2	03/25 12:42	03/25 12:42	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	0.14	0.42	524.2	03/25 12:42	03/25 12:42	MMD
Trans-1,2-Dichloroethylene	U	U	ug/L	0.08	0.24	524.2	03/25 12:42	03/25 12:42	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	03/25 12:42	03/25 12:42	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.16	0.48	524.2	03/25 12:42	03/25 12:42	MMD
Carbon Tetrachloride	U	U	ug/L	0.15	0.45	524.2	03/25 12:42	03/25 12:42	MMD
Benzene	U	U	ug/L	0.11	0.33	524.2	03/25 12:42	03/25 12:42	MMD
1,2-Dichloroethane	U	U	ug/L	0.08	0.24	524.2	03/25 12:42	03/25 12:42	MMD
Trichloroethylene	U	U	ug/L	0.16	0.48	524.2	03/25 12:42	03/25 12:42	MMD
1,2-Dichloropropane	U	U	ug/L	0.14	0.42	524.2	03/25 12:42	03/25 12:42	MMD

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Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Toluene	U	U	ug/L	0.08	0.24	524.2	03/25 12:42	03/25 12:42	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.20	0.60	524.2	03/25 12:42	03/25 12:42	MMD
Tetrachloroethylene	4.07		ug/L	0.29	0.87	524.2	03/25 12:42	03/25 12:42	MMD
Chlorobenzene	U	U	ug/L	0.11	0.33	524.2	03/25 12:42	03/25 12:42	MMD
Ethylbenzene	U	U	ug/L	0.13	0.39	524.2	03/25 12:42	03/25 12:42	MMD
Xylenes (Total)	U	U	ug/L	0.16	0.48	524.2	03/25 12:42	03/25 12:42	MMD
Styrene	U	U	ug/L	0.10	0.30	524.2	03/25 12:42	03/25 12:42	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.08	0.24	524.2	03/25 12:42	03/25 12:42	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.08	0.24	524.2	03/25 12:42	03/25 12:42	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.09	0.27	524.2	03/25 12:42	03/25 12:42	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				Dilution Factor = 1					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.04	0.12	525.2	03/30 11:49	03/30 20:17	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.01	0.03	525.2	03/30 11:49	03/30 20:17	AC
Benzo(a)pyrene	U	U	ug/L	0.01	0.03	525.2	03/30 11:49	03/30 20:17	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	03/30 11:49	03/30 20:17	AC
Alachlor	U	U	ug/L	0.03	0.09	525.2	03/30 11:49	03/30 20:17	AC
Atrazine	U	U	ug/L	0.03	0.09	525.2	03/30 11:49	03/30 20:17	AC
Simazine	U	U	ug/L	0.03	0.09	525.2	03/30 11:49	03/30 20:17	AC

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Order # 9792

Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
552.2 Haloacetic Acids : 62-550.310(3)			Dilution Factor = 1						
Monochloroacetic Acid	U	U	ug/L	0.79	2.37	552.2	03/26 12:08	03/26 16:48	DS
Dichloroacetic Acid	U	U	ug/L	0.45	1.35	552.2	03/26 12:08	03/26 16:48	DS
Trichloroacetic Acid	U	U	ug/L	0.36	1.08	552.2	03/26 12:08	03/26 16:48	DS
Monobromoacetic Acid	U	U	ug/L	0.47	1.41	552.2	03/26 12:08	03/26 16:48	DS
Dibromoacetic Acid	U	U	ug/L	0.37	1.11	552.2	03/26 12:08	03/26 16:48	DS
Total Haloacetic Acids (HAA5)	U		ug/L			552.2	03/26 12:08	03/26 16:48	DS
SUB 300.1 Chlorite & Bromate (Combo Part B)			Dilution Factor = 250						
Chlorite	U	U	ug/L	210	630	EPA 300.1	04/08 21:32	04/08 21:32	E83079
Bromate	U	U	ug/L	80.7	242.1	EPA 300.1	04/08 21:32	04/08 21:32	E83079
Endothall	U	U	mg/L	0.0046	0.0138	548.1	03/31 17:00	04/09 13:25	E84809
Gross Alpha	11.4 ± 1.1		pCi/L	0.5	1.5	EPA 00-02	04/03	04/05 11:36	E84025
Radium-226	2.4 ± 0.3		pCi/L	0.2	0.6	EPA 903.1	03/30	04/05 11:36	E84025
Radium-228	U	U	pCi/L	1.0	3.0	EPA Ra-05	03/27	03/31 12:25	E84025

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

Page 8 of 8
Report Printed: 04/29/10 Rev. 1
Submission # 1003000650
Order # 9792

Project: Hialeah Project Prim/Sec.
Site Location: NW 170th Street & 107th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: IW-1
Collected: 03/24/10 07:20
Received: 03/24/10 17:00
Collected by: Argelio Pifferrer

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Strontium-90	U	U	pCi/L	8.4	25.2	EPA 905.0	03/30	04/13 07:26	E84025

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 this sample.
QC=Qualifier Codes as defined by DEP 62-160
U=Analyzed for but not detected.
Q=Sample held beyond accepted holding time.
I=Value is between MDL and PQL.
J=Estimated value.


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

SUBMISSION # <u>1003-650</u>				CHAIN OF CUSTODY RECORD 1460 W McNab Road Ft Lauderdale 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								
Logged into LIMS by: <u>[Signature]</u>							RUSH RESERVATION #										
Original-Return w/report		Yellow- Lab File Copy			Pink- Sampler Copy			Rush Surcharges apply									
Report to: Youngquist Brothers				Report to Address: 15465 Pine Ridge Road, Ft. Myers , FL 33908													
Invoice to: Youngquist Brothers			Purchase Order #		Invoice to Address: 15465 Pine Ridge Road, Ft. Myers , FL 33908												
Project Name and/or Number : Hialeah project Primary's Secondary's				Site Location: NW 170 th St & 107 th AVE, Hialeah, FL													
Project Mgr: Cameron Webster/ Chris Bannon			Phone: 239-560-4510/ 239.489.4444		Fax: 239-489-4545			Email:									
Sampler Name: (printed) <u>Argelio PIERRENGER</u>				Sampler Signature <u>[Signature]</u>													
ORDER # Lab Control Number		Sample ID	Date Sampled	Time Sampled	Matrix	Bottle & Pres.	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required			Field Tests						
Shaded Areas For Laboratory Use Only					DW SW GW SED S EFF HW BIO SA OIL X	Combo Codes		Primary's	Secondary's	See Quote	Chlorine Dioxide	P H	T E	C O N	D O	T U R	T O T A L
1 <u>9792</u>		<u>IW-1</u> <u>PRIMARY (LAP)</u>	<u>03-24-10</u>	<u>7:20</u>	<u>GW</u>		<u>24</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>0.02</u>	<u>7.15</u>	<u>20.8</u>	<u>49.00</u>	<u>43.1</u>	<u>2</u>	<u><0.01</u>
2		<u>04-29-10</u>															
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
Special Comments:				Total	SAMPLE CUSTODY AND TRANSFER SIGNATURES					DATE / TIME							
"I waive NELAC protocol" (sign here) >					1 Relinquished by: <u>Argelio PIERRENGER</u>					<u>03-24-10 17:00</u>							
Deliverables:				QA/QC Report Needed? Yes No (additional charge)	1 Received by: <u>[Signature]</u>					<u>3/24/10 1700</u>							
Sample Custody & Field Comments				Bottle Type	Preservatives					2 Relinquished by:							
Temp as received <u>4</u> C				A-liter amber	A-ascorbic acid P-H ₃ PO ₄					2 Received by:							
Custody Seals? Y N				B-Bacteria bag/bottle	C-HCL S-H ₂ SO ₄					3 Relinquished by:							
Billable Field Time <u>2</u> hrs				F-500 ml	Cu-CuSO ₄ T-Na ₂ S ₂ O ₃ -H ₂ O					3 Received by:							
Misc. Charges _____				L-liter bottle	H-HNO ₃ U-Unpreserved												
				S-soil jar	M-MCAB P-H ₃ PO ₄												
				T-250 ml	N-NaOH Z-zinc acetate												
				V-40 ml vial													
				W-wide mouth													
				X-other													
www.flenviro.com										COC Page of							

WATER QUALITY ANALYSIS SUMMARY
REVERSE AIR DISCHARGE

WELL: IW-2			PROJECT NO: 0044-0122						Page 1 of 2
SITE LOCATION: Hialeah RO			PERMIT NO: 0289249-001-UC			CONTRACTOR: Youngquist			
DATE	TIME	DEPTH (ft)	FIELD ANALYSIS		LABORATORY ANALYSIS				RECORDED BY
			COND. (µmhos)	CHLORIDE (mg/l)	SPECIF. COND. (umhos)	CHLORIDE (mg/L)	AMMONIA (mg/L)	TKN (mg/L)	
12/16/09	2215	1100	1432	200	1025	142		0.51	RAS
12/17/09	0220	1130	2014	580	1630	425	0.18	0.68	RAS
12/17/09	0600	1160	1961	440	1560	415	0.14	0.62	RAS
12/17/09	0700	1190	1942	400	2300	710	0.24	0.69	DB
12/17/09	1220	1220	2847	700	4100	1560	0.12	0.77	DB
12/17/09	1310	1250	3485	1000	2860	1060	0.06	0.50	DB
12/17/09	1400	1280	7200	2140	5650	2250	0.07	0.62	DB
12/17/09	1510	1310	10,580	3320	8500	3500	0.05	0.60	RAS
12/17/09	1605	1340	8330	2560	6450	2650	0.08	0.69	RAS
12/17/09	1915	1370	13,280	4300	10500	45400	<0.01	0.51	RAS
12/17/09	1950	1400	11,630	3800	9100	3850	<0.01	0.50	RAS
12/17/09	2015	1430	16,460	5500	13,000	5650	0.02	0.57	RAS
12/17/09	2115	1460	13,190	4400	10,600	4400	<0.01	0.56	RAS
12/17/09	2300	1490	13,000	4250	10,600	5350	<0.01	0.52	RAS
12/18/09	2420	1520	12,620	4250	10,400	4250	<0.01	0.48	RAS
12/18/09	0200	1550	14,720	5050	11,800	4950	<0.01	0.47	RAS
12/18/09	0245	1580	15,540	5500	12,300	5350	<0.01	0.45	RAS
12/18/09	0430	1610	16,430	5750	13,100	5700	<0.01	0.52	RAS
12/18/09	0630	1640	17,370	6,190	14,100	5950	<0.01	0.51	DL
12/18/09	0800	1670	14,980	5,245	12,700	5300	<0.01	0.63	DL
12/18/09	1000	1700	15,090	5,290	12,500	5300	<0.01	0.68	DL
12/18/09	1356	1730	19,400	7,290	16,300	6900	<0.01	0.68	DL
12/18/09	1535	1760	18,090	6,300	15,200	3500	<0.01	0.57	RAS
12/18/09	1640	1790	19,030	6,900	16,100	6700	<0.01	0.53	RAS
12/18/09	2330	1820	25,030	9,700	20,800	9100	<0.01	0.46	RAS
12/19/09	0100	1850	26,710	10,200	22,500	9800	<0.01	0.44	RAS
12/19/09	0130	1880	24,860	9,000	21,200	9100	<0.01	0.52	RAS
12/19/09	0330	1910	27,570	9,700	23,400	10,200	<0.01	0.56	RAS
12/19/09	0500	1940	28,400	10,800	24,500	10,500	<0.01	0.45	RAS
01/18/10	2150	1970	NM	NM	64,900	26,500	0.56	0.83	DL
01/19/10	2430	2000	NM	NM	49,300	20,500	0.50	0.78	DL
01/19/10	0145	2030	NM	NM	77,900	32,000	0.56	0.75	DL
01/20/10	0408	2060	NM	NM	68,700	28,000	0.54	0.91	DL
01/20/10	0500	2090	NM	NM	68,900	28,500	0.53	0.88	DL
01/21/10	0447	2120	NM	NM	51,900	27,500	0.50	0.90	DL
01/21/10	NM	NM	NM	NM	NM	NM	NM	NM	DL
01/21/10	1006	2180	NM	NM	54,800	30,000	0.49	0.80	DL

<p style="text-align: center;">WATER QUALITY ANALYSIS SUMMARY</p> <p style="text-align: center;">REVERSE AIR DISCHARGE</p>	
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WELL: IW-2

PROJECT NO: 0044-0122 Page 2 of 2


Page 2 of 2

SITE LOCATION: Hialeah RO

PERMIT NO: 0289249-001-UC

CONTRACTOR: Youngquist

[illegible]

SUBMISSION # 1004-315				CHAIN OF CUSTODY RECORD				DUE DATE Requested RUSH RESERVATION # <i>Rush Surcharges apply</i>			
Logged in LIMS by _____ CSM assigned _____		<input type="checkbox"/> 1460 W. McNab Road Ft Laud. FL 33309 <input type="checkbox"/> 630 Indian Street Savannah, GA 31401 <input type="checkbox"/> 528 Gooch Road Fort Meade, FL 33841 <input type="checkbox"/> 1112 NW Park St., Okeechobee, FL 34972				Tel: (954) 978-6400 Tel: (912) 238-5050 Tel: (863) 285-8145 Tel: (863) 763-3336		Fax: (954) 978-2233 Fax: (912) 234-4815 Fax: (863) 285-7030 Fax: (863) 763-1544			
		Original-Return w/report		Yellow- Lab File Copy		Pink- Sampler Copy					
Report to: (company name) YBI				Report to: Address: Youngquist Bros							
Invoice to: (company name) Same				Purchase Order # 298018		Invoice to: Address: 15465 Pine Ridge Rd Ft Myers.					
Project Name and/or Number Hialeah 1W # 2				Site Location: 16500 NW 97 Ave Hialeah							
Project Contact: Cameron Webster				Phone: 239-560-450		Fax: 239-489-4545		Email: R16 E-2 e Youngquist Bros. Com			
Sampler Name: (printed) Cameron Webster				Affiliation:		Sampler Signature					

ORDER # Lab Control Number	Sample ID	Date Sampled	Time Sampled	Matrix	Bottle & Pres.	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required				Field Tests					
							Turb	DO	TEMP °C	pH	COND	CHLOR				
1	12165	Hialeah														
2		1W # 2	4-13	10:20		24										
3																
4																
5																
6																
7																
8																
9																
10																

Special Comments:
 "I waive NELAC protocol" (sign here) >
 Deliverables: _____ QA/QC Report Needed? Yes No (additional charge)

Total	Signature	Affiliation	Date/Time
1	Relinquished by:		
1	Received by:		4/13/10 1050
2	Relinquished by:		
2	Received by:		4/13/10 1315
3	Relinquished by:		4/13/10 1315
3	Received by:		

Sample Custody & Field Comments	Bottle Type	Preservatives
Temp as received _____ C Custody Seals? Y N FIELD TIME: Sampling _____ hrs Pick-Up _____ hrs Misc. Charges _____	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	A-ascorbic acid P-H3PO4 C-HCL S-H2SO4 Cu-CuSO4 T-Na2S2O3-H2O H-HNO3 U-Unpreserved M-MCAB N-NaOH Z-zinc acetate NH4-NH4CL

Ref. No: G-46595853

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated February 1, 2007

Page 1 of 3

PRIMARY DRINKING WATER STANDARDS

PARAMETER

- Alachlor (Polychlorinated Biphenyl or PCB)
- Aldicarb
- Aldicarb sulfoxide
- Aldicarb sulfone
- Alpha, Gross
- Antimony
- Arsenic
- Atrazine
- Barium
- Benzene
- Benzo(a)pyrene
- Beryllium
- Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
- Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
- Bromate
- Cadmium
- Carbofuran
- Carbon Tetrachloride (Tetrachloromethane)
- Chlordane
- Chlorine
- Chlorine Dioxide
- Chlorite
- Chlorobenzene (Monochlorobenzene)
- Chloroethylene (Vinyl Chloride)
- Chromium
- Coliforms, Total
- Cyanide
- 2,4-D (2,4-Dichlorophenoxyacetic acid)
- Dalapon (2,2-Dichloropropionic acid)
- Dibromochloropropane (DBCP)
- 1,2-Dibromoethane (EDB, Ethylene Dibromide)
- 1,2-Dichlorobenzene (o-Dichlorobenzene)
- 1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
- 1,2-Dichloroethane (Ethylene dichloride)
- 1,1-Dichloroethylene (Vinylidene chloride)
- 1,2-Dichloroethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
- cis-1,2-Dichloroethylene (1,2-Dichloroethylene)
- trans-1,2-Dichloroethylene (1,2-Dichloroethylene)
- Dichloromethane (Methylene chloride)
- 1,2-Dichloropropane
- Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
- Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
- Dinoseb
- Diquat
- EDB (Ethylene dibromide, 1,2-Dibromoethane)
- Endothall
- Endrin
- Ethylbenzene
- Ethylene dichloride (1,2-Dichloroethane)
- Fluoride
- Glyphosate (Roundup)
- Gross Alpha
- Haloacetic acids (HAA5)
- Heptachlor
- Heptachlor Epoxide
- Hexachlorobenzene (HCB)
- gamma-Hexachlorocyclohexane (Lindane)
- Hexachlorocyclopentadiene
- Lead

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated May 6, 2002

Page 2 of 3

PRIMARY DRINKING WATER STANDARDS, CONT'D

PARAMETER

- Lindane (gamma-Hexachlorocyclohexane)
- Mercury
- Methoxychlor
- Methylene chloride (Dichloromethane)
- Monochlorobenzene (Chlorobenzene)
- Nickel
- Nitrate (as N)
- Nitrite (as N)
- Total Nitrate + Nitrite (as N)
- Oxamyl
- p-Dichlorobenzene or Para Dichlorobenzene (1,4-Dichlorobenzene)
- Pentachlorophenol
- Perchloroethylene (Tetrachloroethylene)
- Picloram
- Polychlorinated biphenyl (PCB or Aroclors)
- Radium
- Roundup (Glyphosate)
- Selenium
- Silver
- Silvex (2,4,5-TP)
- Simazine
- Sodium
- Strontium-90
- Styrene (Vinyl benzene)
- Tetrachloroethylene (Perchloroethylene)
- Tetrachloromethane (Carbon Tetrachloride)
- Thallium
- Toluene
- Toxaphene
- 2,4,5-TP (Silvex)
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethylene (Trichloroethene, TCE)
- Trihalomethanes, Total
- Vinyl Chloride (Chloroethylene)
- Xylenes (total)

PRIMARY & SECONDARY DRINKING WATER STANDARDS
Updated May 6, 2002

Page 3 of 3

SECONDARY DRINKING WATER STANDARDS

PARAMETER

- Aluminum
- Chloride
- Color
- Copper
- Ethylbenzene
- Fluoride
- Foaming Agents (MBAS)
- Iron
- Manganese
- Odor
- pH
- Silver
- Sulfate
- Toluene
- Total Dissolved Solids (TDS)
- Xylenes
- Zinc



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

Page 1 of 8
Report Printed: 04/29/10
Submission # 1004000315
Order # 12165

Project: Hialeah IW #2
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: Hialeah IW #2
Collected: 04/13/10 10:20
Received: 04/13/10 13:15
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Coliform-Total (E-Coli)	P(A)		-----			9223B	04/13	04/14	CEB
pH (field)	7.8		units	0.1	0.3	150.1	04/13	04/13	Client
531.1 Carbamate Pesticides: 62-550 (Unregulated)			Dilution Factor = 1						
Aldicarb Sulfoxide	U	U	ug/L	0.37	1.11	531.1	04/20	04/20	RPV
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	04/20	04/20	RPV
Methomyl	U	U	ug/L	0.26	0.78	531.1	04/20	04/20	RPV
3-Hydroxycarbofuran	U	U	ug/L	0.56	1.68	531.1	04/20	04/20	RPV
Aldicarb	U	U	ug/L	0.66	1.98	531.1	04/20	04/20	RPV
Carbaryl	U	U	ug/L	0.25	0.75	531.1	04/20	04/20	RPV
531.1 Carbamate Pesticides: 62-550.310(4)(b)			Dilution Factor = 1						
Carbofuran	U	U	ug/L	0.45	1.35	531.1	04/20	04/20	RPV
Oxamyl (Vydate)	U	U	ug/L	0.41	1.23	531.1	04/20	04/20	RPV
Glyphosate	U	U	ug/L	3.55	10.65	547	04/26	04/26	RPV
549.2 Diquat: 62-550.310(4)(b)			Dilution Factor = 1						
Diquat	U	U	ug/L	0.4	1.2	549.2	04/20	04/20	RPV
Chloride	21000		mg/L	77.50	232.50	300.0	04/14	04/14 940	DGK
Fluoride	1.58		mg/L	0.400	1.200	300.0	04/14	04/14	DGK
Nitrate (as N)	1.73		mg/L	0.050	0.150	300.0	04/14	04/14	DGK

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

Pembroke Laboratory
528 Gooch Rd.
Fort Mead, FL 33841

Big Lake Laboratory
415 B SW Park St.
Okeechobee, FL 34972

Spectrum Laboratories
630 Indian St.
Savannah, GA 31401

www.flenviro.com

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

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

Page 2 of 8
Report Printed: 04/29/10
Submission # 1004000315
Order # 12165

Project: Hialeah IW #2
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: Hialeah IW #2
Collected: 04/13/10 10:20
Received: 04/13/10 13:15
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Nitrate + Nitrite (as N)	1.73		mg/L	0.060	0.180	300.0	04/14	04/14	DGK
Nitrite (as N)	U	U	mg/L	0.060	0.180	300.0	04/14	04/14	DGK
Sulfate	2670		mg/L	10.00	30.00	300.0	04/14	04/14	DGK
Color/pH (Lab)	U/7.89	U	Pt-Co	1.0	3.0	SM2120B	04/13	04/13	IMA
Odor (Lab) at 40 Degrees C	1		TON	1.0	3.0	SM2150B	04/13	04/13	IMA
Total Dissolved Solids (TDS)	39400		mg/L	1.00	3.00	SM 2540C	04/14	04/15	RPV
Cyanide, Total	U	U	mg/L	0.002	0.006	SM4500CN-E	04/14	04/14	MSG
MBAS Surfactants	0.149		mg/L	0.033	0.099	SM5540C	04/15	04/15	DGK
Aluminum	0.031		mg/L	0.0007	0.0021	200.7	04/13	04/13	IMN
Copper	U	U	mg/L	0.0002	0.0006	200.7	04/13	04/13	IMN
Iron	0.032		mg/L	0.0008	0.0024	200.7	04/13	04/13	IMN
Manganese	0.003		mg/L	0.00009	0.00027	200.7	04/13	04/13	IMN
Silver	U	U	mg/L	0.0001	0.0003	200.7	04/13	04/13	IMN
Sodium	10662		mg/L	0.560	1.680	200.7	04/13	04/14	IMN
Zinc	0.014		mg/L	0.00050	0.00150	200.7	04/13	04/13	IMN
200.8 DW-10 Metals in Drinking Water 62-550.310				Dilution Factor = 10					
Arsenic	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	04/14	04/14	IMN
Barium	0.0124		mg/L	0.00040	0.00120	4.1.3/200.8	04/14	04/14	IMN

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

Page 3 of 8
Report Printed: 04/29/10
Submission # 1004000315
Order # 12165

Project: Hialeah IW #2
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: Hialeah IW #2
Collected: 04/13/10 10:20
Received: 04/13/10 13:15
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Cadmium	U	U	mg/L	0.00080	0.00240	4.1.3/200.8	04/14	04/14	IMN
Chromium	U	U	mg/L	0.0010	0.0030	4.1.3/200.8	04/14	04/14	IMN
Lead	U	U	mg/L	0.00060	0.00180	4.1.3/200.8	04/14	04/14	IMN
Nickel	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	04/14	04/14	IMN
Selenium	U	U	mg/L	0.0090	0.0270	4.1.3/200.8	04/14	04/14	IMN
Antimony	0.005	I	mg/L	0.0020	0.0060	4.1.3/200.8	04/14	04/14	IMN
Beryllium	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	04/14	04/14	IMN
Thallium	U	U	mg/L	0.00004	0.00012	4.1.3/200.8	04/14	04/14	IMN
Mercury	U	U	mg/L	0.0001	0.0003	245.1	04/14	04/14	EN
504.1 EDB, DBCP: 62-550.310(4)(b)						Dilution Factor = 1			
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	04/16	04/17	AC
Ethylene Dibromide (EDB)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	04/16	04/17	AC
508 Pesticides & PCBs: 62-550.310(4)(b)						Dilution Factor = 1			
Hexachlorocyclopentadiene	U	U	ug/L	0.015	0.045	508	04/15	04/16	AC
Hexachlorobenzene	U	U	ug/L	0.006	0.018	508	04/15	04/16	AC
v-BHC (Lindane)	U	U	ug/L	0.005	0.015	508	04/15	04/16	AC
Heptachlor	U	U	ug/L	0.002	0.006	508	04/15	04/16	AC
Heptachlor Epoxide	U	U	ug/L	0.002	0.006	508	04/15	04/16	AC

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

Page 4 of 8
Report Printed: 04/29/10
Submission # 1004000315
Order # 12165

Project: Hialeah IW #2
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Water

Sample I.D.: Hialeah IW #2
Collected: 04/13/10 10:20
Received: 04/13/10 13:15
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Endrin	U	U	ug/L	0.005	0.015	508	04/15	04/16	AC
Methoxychlor	U	U	ug/L	0.005	0.015	508	04/15	04/16	AC
Arochlor 1016	U	U	ug/L	0.1	0.3	508	04/15	04/16	AC
Arochlor 1221	U	U	ug/L	0.02	0.06	508	04/15	04/16	AC
Arochlor 1232	U	U	ug/L	0.03	0.09	508	04/15	04/16	AC
Arochlor 1242	U	U	ug/L	0.02	0.06	508	04/15	04/16	AC
Arochlor 1248	U	U	ug/L	0.03	0.09	508	04/15	04/16	AC
Arochlor 1254	U	U	ug/L	0.02	0.06	508	04/15	04/16	AC
Arochlor 1260	U	U	ug/L	0.03	0.09	508	04/15	04/16	AC
Toxaphene	U	U	ug/L	0.21	0.63	508	04/15	04/16	AC
Chlordane	U	U	ug/L	0.03	0.09	508	04/15	04/16	AC
515.3 Chlorophenoxy Herbicides 62-550 (Reg)				Dilution Factor = 1					
Dalapon	U	U	ug/L	0.09	0.27	515.3	04/15	04/16	AC
2,4-D	U	U	ug/L	0.08	0.24	515.3	04/15	04/16	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	04/15	04/16	AC
2,4,5-TP (silvex)	U	U	ug/L	0.04	0.12	515.3	04/15	04/16	AC
Dinoseb	U	U	ug/L	0.11	0.33	515.3	04/15	04/16	AC
Picloram	U	U	ug/L	0.06	0.18	515.3	04/15	04/16	AC

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
524.2 Trihalomethanes: 62-550.310(3) THMs Dilution Factor = 1									
Bromodichloromethane	U	U	ug/L	0.25	0.75	524.2	04/15	04/15	MMD
Dibromochloromethane	U	U	ug/L	0.13	0.39	524.2	04/15	04/15	MMD
Tribromomethane (Bromoform)	U	U	ug/L	0.43	1.29	524.2	04/15	04/15	MMD
Trichloromethane (Chloroform)	U	U	ug/L	0.13	0.39	524.2	04/15	04/15	MMD
TOTAL Trihalomethanes	U		ug/L			524.2	04/15	04/15	MMD
524.2 Volatile Organics: 62-550.310(4)(a) Dilution Factor = 1									
Vinyl Chloride	U	U	ug/L	0.31	0.93	524.2	04/15	04/15	MMD
1,1-Dichloroethylene	U	U	ug/L	0.18	0.54	524.2	04/15	04/15	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	0.14	0.42	524.2	04/15	04/15	MMD
Trans-1,2-Dichloroethylene	U	U	ug/L	0.08	0.24	524.2	04/15	04/15	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	04/15	04/15	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.16	0.48	524.2	04/15	04/15	MMD
Carbon Tetrachloride	U	U	ug/L	0.15	0.45	524.2	04/15	04/15	MMD
Benzene	U	U	ug/L	0.11	0.33	524.2	04/15	04/15	MMD
1,2-Dichloroethane	U	U	ug/L	0.08	0.24	524.2	04/15	04/15	MMD
Trichloroethylene	U	U	ug/L	0.16	0.48	524.2	04/15	04/15	MMD
1,2-Dichloropropane	U	U	ug/L	0.14	0.42	524.2	04/15	04/15	MMD

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Toluene	U	U	ug/L	0.08	0.24	524.2	04/15	04/15	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.20	0.60	524.2	04/15	04/15	MMD
Tetrachloroethylene	0.87		ug/L	0.29	0.87	524.2	04/15	04/15	MMD
Chlorobenzene	U	U	ug/L	0.11	0.33	524.2	04/15	04/15	MMD
Ethylbenzene	0.77		ug/L	0.13	0.39	524.2	04/15	04/15	MMD
Xylenes (Total)	3.54		ug/L	0.16	0.48	524.2	04/15	04/15	MMD
Styrene	U	U	ug/L	0.10	0.30	524.2	04/15	04/15	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.08	0.24	524.2	04/15	04/15	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.08	0.24	524.2	04/15	04/15	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.09	0.27	524.2	04/15	04/15	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				Dilution Factor = 1					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.04	0.12	525.2	04/20	04/20	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.01	0.03	525.2	04/20	04/20	AC
Benzo(a)pyrene	U	U	ug/L	0.01	0.03	525.2	04/20	04/20	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	04/20	04/20	AC
Alachlor	U	U	ug/L	0.03	0.09	525.2	04/20	04/20	AC
Atrazine	U	U	ug/L	0.03	0.09	525.2	04/20	04/20	AC
Simazine	U	U	ug/L	0.03	0.09	525.2	04/20	04/20	AC

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
552.2 Haloacetic Acids : 62-550.310(3)				Dilution Factor = 1					
Monochloroacetic Acid	U	U	ug/L	0.79	2.37	552.2	04/19	04/20	AC
Dichloroacetic Acid	U	U	ug/L	0.45	1.35	552.2	04/19	04/20	AC
Trichloroacetic Acid	2.06		ug/L	0.36	1.08	552.2	04/19	04/20	AC
Monobromoacetic Acid	U	U	ug/L	0.47	1.41	552.2	04/19	04/20	AC
Dibromoacetic Acid	1.06	I	ug/L	0.37	1.11	552.2	04/19	04/20	AC
Total Haloacetic Acids (HAA5)	3.1		ug/L			552.2	04/19	04/20	AC
SUB 300.1 Chlorite & Bromate (Combo Part B)				Dilution Factor = 250					
Chlorite	U	U	mg/L	210.0	630.0	EPA 300.1	04/23	04/23	E83079
Bromate	U	U	mg/L	80.7	242.1	EPA 300.1	04/23	04/23	E83079
Endothall	U	U	mg/L	0.0046	0.0138	548.1	04/20	04/26	E84809
EPA 900.0 Gross Alpha	8.2 ± 1.1		pCi/L	0.6	1.8	EPA 900.0	04/20	04/22	E84025
Radium-226	2.8 ± 0.3		pCi/L	0.2	0.6	EPA 903.1	04/19	04/26	E84025
Radium-228	1.0 ± 0.7		pCi/L	1.0	3.0	EPA Ra-05	04/19	04/22	E84025

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Strontium-90	5.9 ± 3.2		pCi/L	0.30	0.90	EPA 905.0	04/13	04/27	E84025

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 this sample.
QC=Qualifier Codes as defined by DEP 62-160
U=Analyzed for but not detected.
Q=Sample held beyond accepted holding time.
I=Value is between MDL and PQL.
J=Estimated value.


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

WATER QUALITY ANALYSIS SUMMARY

REVERSE AIR DISCHARGE

WELL: DZMW-1			PROJECT NO: 0044-0122						Page 1 of 1
SITE LOCATION: Hialeah RO			PERMIT NO: 0289249-001-UC			CONTRACTOR: Youngquist			
DATE	TIME	DEPTH (ft)	FIELD ANALYSIS		LABORATORY ANALYSIS				RECORDED BY
			COND. (µmhos)	CHLORIDE (mg/l)	SPECIF. COND. (umhos)	CHLORIDE (mg/L)	AMMONIA (mg/L)	TKN (mg/L)	
04/09/10	0220	1110	24,740	8220	24600	9400	0.35	0.93	RS
04/09/10	0500	1140	22,630	7500	22300	8600	0.33	0.82	RS
04/09/10	0620	1170	22,840	8200	22600	8400	0.35	0.84	DL
04/09/10	0900	1200	22,370	7200	22000	8600	0.24	0.76	DL
04/09/10	1730	1230	22,100	7400	22300	8400	0.31	0.95	DL
04/09/10	1832	1260	21,830	6800	22200	8200	0.25	0.76	DL
04/09/10	2008	1290	24,970	8300	25200	9800	0.32	0.88	DL
04/09/10	2220	1320	24,620	8900	24800	9600	0.30	0.94	DL
04/10/10	0120	1350	27,440	9400	27700	10800	0.31	0.90	DL
04/10/10	0210	1380	26,780	9000	27000	10000	0.31	0.86	DL
04/10/10	0300	1410	26,760	9300	27000	10000	0.30	0.94	MO
04/10/10	0456	1440	32,440	11,300	32900	12800	0.33	0.82	MO
04/10/10	0530	1470	32,660	11,000	32900	12800	0.34	0.88	MO
04/10/10	0650	1500	28,650	10,400	29400	11000	0.31	0.81	MO
04/10/10	0730	1530	28,950	10,200	29400	11400	0.32	0.88	MO
04/10/10	0935	1560	34,280	12,400	34700	13800	0.36	0.85	MO
04/10/01	1115	1590	46,620	17,200	47200	18600	0.39	1.45	MO
04/10/10	NM	1620	NM	NM	NM	NM	NM	NM	MO
04/10/10	1250	1650	45,440	16,000	46300	18400	0.40	0.91	MO
04/10/10	1440	1680	44,830	16,600	45200	18200	0.40	0.84	MO
04/10/10	1600	1710	41,090	15,400	41400	16600	0.38	0.82	MO
04/10/10	1640	1740	41,140	15,450	41300	16600	0.38	0.79	DL
04/10/10	1858	1770	39,850	14,750	40100	16000	0.38	0.80	DL
04/10/10	2040	1800	38,310	14,100	38400	15000	0.39	0.77	DL
04/10/10	2110	1830	37,850	14,200	37900	15000	0.38	0.77	DL
04/10/10	2310	1860	39,570	14,750	40100	16000	0.39	0.77	DL
04/11/10	2458	1890	35,250	12,900	35700	14200	0.40	0.80	DL
04/11/10	0315	1920	37,540	13,900	37800	15400	0.39	0.76	DL

SUBMISSION # 1005-236				CHAIN OF CUSTODY RECORD				DUE DATE Requested RUSH RESERVATION # Rush Surcharges apply			
Logged in LIMS by <i>KL</i> CSM assigned		<input type="checkbox"/> 1460 W. McNab Road Ft Laud. FL 33309 <input type="checkbox"/> 630 Indian Street Savannah, GA 31401 <input type="checkbox"/> 528 Gooch Road Fort Meade, FL 33841 <input type="checkbox"/> 1112 NW Park St., Okeechobee, FL 34972		Tel: (954) 978-6400 Tel: (912) 238-5050 Tel: (863) 285-8145 Tel: (863) 763-3336		Fax: (954) 978-2233 Fax: (912) 234-4815 Fax: (863) 285-7030 Fax: (863) 763-1544					
		Original-Return w/report		Yellow- Lab File Copy		Pink- Sampler Copy					
Report to: (company name) <i>YBI</i>				Report to: Address:							
Invoice to: (company name) <i>Youngquist Bros</i>				Purchase Order # <i>298018</i>				Invoice to: Address: <i>15465 Pine Ridge Rd Ft Myers.</i>			
Project Name and/or Number <i>Hialeah DZMW</i>				Site Location: <i>16500 NW 97th Ave Hialeah FL</i>				Fax: <i>239-489-4545</i>			
Project Contact: <i>Cameron Webster</i>				Phone: <i>239-560-4510</i>				Email: <i>RIG E2 @ Youngquist Bros. Hoffman 2 @ Fort Myers Water, SLD, Com</i>			
Sampler Name: <i>Cameron Webster</i>				Affiliation: <i>YBI</i>				Sampler Signature: <i>Cam Webster</i>			

ORDER # <small>Lab Control Number</small>	Sample ID	Date Sampled	Time Sampled	Matrix <small>DW SW GW WW S SED HW BIO SEA OIL X AIR</small>	Bottle & Pres. Combo Codes	Number of Containers Received & NELAC Letter Suffixes # A-?	Analysis Required			Field Tests			
							TURB	Chlorine Dioxide	D.O	TEMP °C	PH	COND	CHLOR
1	15886 DZMW						4	0.2	1.21	23.1	7.34	35600	<0.1
2	Upper	5-10-10	8am DW			24							
3													
4	15887 DZMW												
5	Lower	5-10-10	9am DW			21							
6													
7							15	0.2	1.68	23.5	7.65	38500	<0.1
8													
9													
10													

Special Comments:
"I waive NELAC protocol" (sign here) >
Deliverables:

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

Total

#	Signature	Affiliation	Date/Time
1	Relinquished by: <i>Cam Webster</i>		5-10-10 10:30
1	Received by: <i>Aracelio Pifferrer</i>		5-10-10 10:30
2	Relinquished by: <i>Aracelio Pifferrer</i>		5-10-10 10:10
2	Received by: <i>Aracelio Pifferrer</i>		5-10-10 10:10
3	Relinquished by:		
3	Received by:		

Sample Custody & Field Comments
Temp as received *4* °C
Custody Seals? *Y* *N*
FIELD TIME:
Sampling *2* hrs
Pick-Up _____ 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 N-NaOH
Z-zinc acetate NH4-NH4CL

Rel. No: G 485/953853

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated February 1, 2007

Page 1 of 3

PRIMARY DRINKING WATER STANDARDS

PARAMETER

Alachlor (Polychlorinated Biphenyl or PCB)
Aldicarb
Aldicarb sulfoxide
Aldicarb sulfone
Alpha, Gross
Antimony
Arsenic
Atrazine
Barium
Benzene
Benzo(a)pyrene
Beryllium
Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
Bromate
Cadmium
Carbofuran
Carbon Tetrachloride (Tetrachloromethane)
Chlordane
Chlorine
Chlorine Dioxide
Chlorite
Chlorobenzene (Monochlorobenzene)
Chloroethylene (Vinyl Chloride)
Chromium
Coliforms, Total
Cyanide
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dalapon (2,2-Dichloropropionic acid)
Dibromochloropropane (DBCP)
1,2-Dibromoethane (EDB, Ethylene Dibromide)
1,2-Dichlorobenzene (o-Dichlorobenzene)
1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (Vinylidene chloride)
1,2-Dichloroethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
cis-1,2-Dichloroethylene (1,2-Dichloroethylene)
trans-1,2-Dichloroethylene (1,2-Dichloroethylene)
Dichloromethane (Methylene chloride)
1,2-Dichloropropane
Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
Dinoseb
Diquat
EDB (Ethylene dibromide, 1,2-Dibromoethane)
Endothall
Endrin
Ethylbenzene
Ethylene dichloride (1,2-Dichloroethane)
Fluoride
Glyphosate (Roundup)
Gross Alpha
Haloacetic acids (HAA5)
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
gamma-Hexachlorocyclohexane (Lindane)
Hexachlorocyclopentadiene
Lead

PRIMARY & SECONDARY DRINKING WATER STANDARDS
Updated May 6, 2002

Page 2 of 3

PRIMARY DRINKING WATER STANDARDS, CONT'D

PARAMETER

Lindane (gamma-Hexachlorocyclohexane)
Mercury
Methoxychlor
Methylene chloride (Dichloromethane)
Monochlorobenzene (Chlorobenzene)
Nickel
Nitrate (as N)
Nitrite (as N)
Total Nitrate + Nitrite (as N)
Oxamyl
p-Dichlorobenzene or Para Dichlorobenzene (1,4-Dichlorobenzene)
Pentachlorophenol
Perchloroethylene (Tetrachloroethylene)
Picloram
Polychlorinated biphenyl (PCB or Aroclors)
Radium
Roundup (Glyphosate)
Selenium
Silver
Silvex (2,4,5-TP)
Simazine
Sodium
Strontium-90
Styrene (Vinyl benzene)
Tetrachloroethylene (Perchloroethylene)
Tetrachloromethane (Carbon Tetrachloride)
Thallium
Toluene
Toxaphene
2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene, TCE)
Trihalomethanes, Total
Vinyl Chloride (Chloroethylene)
Xylenes (total)

PRIMARY & SECONDARY DRINKING WATER STANDARDS

Updated May 6, 2002

Page 3 of 3

SECONDARY DRINKING WATER STANDARDS

PARAMETER

Aluminum
Chloride
Color
Copper
Ethylbenzene
Fluoride
Foaming Agents (MBAS)
Iron
Manganese
Odor
pH
Silver
Sulfate
Toluene
Total Dissolved Solids (TDS)
Xylenes
Zinc



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

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Report Printed: 06/03/10
Submission # 1005000236
Order # 15886

Project: Hialeah DZMW
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Drinking Water

Sample I.D.: DZMW Upper
Collected: 05/10/10 08:00
Received: 05/10/10 16:10
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Coliform-Total (E-Coli)	P(A)		-----			9223B	05/10 17:00	05/11 17:00	DMB
pH (field)	9.34		units	0.1	0.3	150.1	05/10 08:00	05/10 08:00	Client
531.1 Carbamate Pesticides: 62-550 (Unregulated)			Dilution Factor = 1						
Aldicarb Sulfoxide	U	U	ug/L	0.37	1.11	531.1	05/13 13:53	05/13 13:53	CEB
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	05/13 13:53	05/13 13:53	CEB
Methomyl	U	U	ug/L	0.26	0.78	531.1	05/13 13:53	05/13 13:53	CEB
3-Hydroxycarbofuran	U	U	ug/L	0.56	1.68	531.1	05/13 13:53	05/13 13:53	CEB
Aldicarb	U	U	ug/L	0.66	1.98	531.1	05/13 13:53	05/13 13:53	CEB
Carbaryl	U	U	ug/L	0.25	0.75	531.1	05/13 13:53	05/13 13:53	CEB
531.1 Carbamate Pesticides: 62-550.310(4)(b)			Dilution Factor = 1						
Carbofuran	U	U	ug/L	0.45	1.35	531.1	05/13 13:53	05/13 13:53	CEB
Oxamyl (Vydate)	U	U	ug/L	0.41	1.23	531.1	05/13 13:53	05/13 13:53	CEB
Glyphosate	U	U	ug/L	3.55	10.65	547	05/11 12:51	05/11 12:51	CEB
Endothall	U	U	ug/L	0.0046	0.0138	548.1	05/13 10:00	05/14 13:37	CEB
549.2 Diquat: 62-550.310(4)(b)			Dilution Factor = 1						
Diquat	U	U	ug/L	0.4	1.2	549.2	05/11 13:00	05/11 15:02	CEB
Chloride	10480		mg/L	62.00	186.00	300.0	05/11 18:11	05/11 18:11	DGK
Fluoride	1.31		mg/L	0.400	1.200	300.0	05/11 18:11	05/11 18:11	DGK

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

Pembroke Laboratory
528 Gooch Rd.
Fort Mead, FL 33841

Big Lake Laboratory
415 B SW Park St.
Okeechobee, FL 34972

Spectrum Laboratories
630 Indian St.
Savannah, GA 31401

www.flenviro.com

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

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Site Location: 16500 NW 97th Avenue, Hialeah, FL
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Nitrate (as N)	U	U	mg/L	0.050	0.150	300.0	05/11 18:11	05/11 18:11	DGK
Nitrate + Nitrite (as N)	U	U	mg/L	0.060	0.180	300.0	05/11 18:11	05/11 18:11	DGK
Nitrite (as N)	U	U	mg/L	0.060	0.180	300.0	05/11 18:11	05/11 18:11	DGK
Sulfate	958		mg/L	8.00	24.00	300.0	05/11 18:11	05/11 18:11	DGK
Cyanide, Total	U	U	mg/L	0.002	0.006	335.4	05/13 10:01	05/13 11:55	MSG
Color/pH (Lab)	U	U	Pt-Co	1.0	3.0	SM2120B	05/12 09:00	05/12 09:00	DGK
Odor (Lab) at 40 Degrees C	1		TON	1.0	3.0	SM2150B	05/10 17:55	05/10 17:55	RPV
Total Dissolved Solids (TDS)	19400		mg/L	1.00	3.00	SM 2540C	05/12 12:50	05/14 10:58	LYR
MBAS Surfactants	0.082	I	mg/L	0.033	0.099	SM5540C	05/11 15:21	05/11 15:21	DGK
Aluminum	0.051		mg/L	0.0007	0.0021	200.7	05/11	05/11 17:46	IMA
Copper	U	U	mg/L	0.0002	0.0006	200.7	05/10	05/11 17:46	IMA
Iron	0.161		mg/L	0.0008	0.0024	200.7	05/10	05/11 17:46	IMA
Manganese	0.014		mg/L	0.00009	0.00027	200.7	05/10	05/11 17:46	IMA
Silver	U	U	mg/L	0.0001	0.0003	200.7	05/10	05/11 17:46	IMA
Sodium	5575		mg/L	0.280	0.840	200.7	05/10	05/12 13:21	IMA
Zinc	U	U	mg/L	0.00050	0.00150	200.7	05/10	05/11 17:46	IMA
200.8 DW-10 Metals in Drinking Water 62-550.310				Dilution Factor = 10					
Arsenic	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN

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Project: Hialeah DZMW
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Drinking Water

Sample I.D.: DZMW Upper
Collected: 05/10/10 08:00
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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Barium	0.0879		mg/L	0.00040	0.00120	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Cadmium	U	U	mg/L	0.00080	0.00240	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Chromium	U	U	mg/L	0.0010	0.0030	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Lead	U	U	mg/L	0.00060	0.00180	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Nickel	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Selenium	U	U	mg/L	0.0090	0.0270	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Antimony	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Beryllium	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Thallium	U	U	mg/L	0.00004	0.00012	4.1.3/200.8	05/11 09:00	05/11 11:55	IMN
Mercury	U	U	mg/L	0.00007	0.00021	245.1	05/11	05/11 16:20	EN
504.1 EDB, DBCP: 62-550.310(4)(b)				Dilution Factor = 1					
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	05/1109:00	05/12 17:41	MD
Ethylene Dibromide (EDB)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	05/1109:00	05/12 17:41	MD
508 Pesticides & PCBs: 62-550.310(4)(b)				Dilution Factor = 1					
Hexachlorocyclopentadiene	U	U	ug/L	0.010	0.030	508	05/13 09:53	05/14 09:53	AC
Hexachlorobenzene	U	U	ug/L	0.009	0.027	508	05/13 09:53	05/14 09:53	AC
g-BHC (Lindane)	U	U	ug/L	0.012	0.036	508	05/13 09:53	05/14 09:53	AC
Heptachlor	U	U	ug/L	0.012	0.036	508	05/13 09:53	05/14 09:53	AC

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Heptachlor Epoxide	U	U	ug/L	0.011	0.033	508	05/13 09:53	05/14 09:53	AC
Endrin	U	U	ug/L	0.010	0.030	508	05/13 09:53	05/14 09:53	AC
Methoxychlor	U	U	ug/L	0.013	0.039	508	05/13 09:53	05/14 09:53	AC
Arochlor 1016	U	U	ug/L	0.052	0.156	508	05/13 09:53	05/14 09:53	AC
Arochlor 1221	U	U	ug/L	0.021	0.063	508	05/13 09:53	05/14 09:53	AC
Arochlor 1232	U	U	ug/L	0.025	0.075	508	05/13 09:53	05/14 09:53	AC
Arochlor 1242	U	U	ug/L	0.019	0.057	508	05/13 09:53	05/14 09:53	AC
Arochlor 1248	U	U	ug/L	0.034	0.102	508	05/13 09:53	05/14 09:53	AC
Arochlor 1254	U	U	ug/L	0.024	0.072	508	05/13 09:53	05/14 09:53	AC
Arochlor 1260	U	U	ug/L	0.027	0.081	508	05/13 09:53	05/14 09:53	AC
Toxaphene	U	U	ug/L	0.21	0.63	508	05/13 09:53	05/14 09:53	AC
Chlordane	U	U	ug/L	0.03	0.09	508	05/13 09:53	05/14 09:53	AC
515.3 Chlorophenoxy Herbicides 62-550 (Reg)						Dilution Factor = 1			
Dalapon	U	U	ug/L	0.09	0.27	515.3	05/12 09:38	05/13 09:38	AC
2,4-D	U	U	ug/L	0.08	0.24	515.3	05/12 09:38	05/13 09:38	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	05/12 09:38	05/13 09:38	AC
2,4,5-TP (silvex)	U	U	ug/L	0.04	0.12	515.3	05/12 09:38	05/13 09:38	AC
Dinoseb	U	U	ug/L	0.11	0.33	515.3	05/12 09:38	05/13 09:38	AC

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PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Picloram	U	U	ug/L	0.06	0.18	515.3	05/12 09:38	05/13 09:38	AC
524.2 Trihalomethanes: 62-550.310(3) THMs Dilution Factor = 1									
Bromodichloromethane	U	U	ug/L	0.25	0.75	524.2	05/11 20:15	05/11 20:15	MMD
Dibromochloromethane	U	U	ug/L	0.13	0.39	524.2	05/11 20:15	05/11 20:15	MMD
Tribromomethane (Bromoform)	U	U	ug/L	0.43	1.29	524.2	05/11 20:15	05/11 20:15	MMD
Trichloromethane (Chloroform)	0.20	I	ug/L	0.13	0.39	524.2	05/11 20:15	05/11 20:15	MMD
TOTAL Trihalomethanes	0.2		ug/L			524.2	05/11 20:15	05/11 20:15	MMD
524.2 Volatile Organics: 62-550.310(4)(a) Dilution Factor = 1									
Vinyl Chloride	U	U	ug/L	0.31	0.93	524.2	05/11 20:15	05/11 20:15	MMD
1,1-Dichloroethylene	U	U	ug/L	0.18	0.54	524.2	05/11 20:15	05/11 20:15	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	0.14	0.42	524.2	05/11 20:15	05/11 20:15	MMD
Trans-1,2-Dichloroethylene	U	U	ug/L	0.08	0.24	524.2	05/11 20:15	05/11 20:15	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	05/11 20:15	05/11 20:15	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.16	0.48	524.2	05/11 20:15	05/11 20:15	MMD
Carbon Tetrachloride	U	U	ug/L	0.15	0.45	524.2	05/11 20:15	05/11 20:15	MMD
Benzene	U	U	ug/L	0.11	0.33	524.2	05/11 20:15	05/11 20:15	MMD
1,2-Dichloroethane	U	U	ug/L	0.08	0.24	524.2	05/11 20:15	05/11 20:15	MMD
Trichloroethylene	U	U	ug/L	0.16	0.48	524.2	05/11 20:15	05/11 20:15	MMD

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1,2-Dichloropropane	U	U	ug/L	0.14	0.42	524.2	05/11 20:15	05/11 20:15	MMD
Toluene	0.24		ug/L	0.08	0.24	524.2	05/11 20:15	05/11 20:15	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.20	0.60	524.2	05/11 20:15	05/11 20:15	MMD
Tetrachloroethylene	U	U	ug/L	0.29	0.87	524.2	05/11 20:15	05/11 20:15	MMD
Chlorobenzene	U	U	ug/L	0.11	0.33	524.2	05/11 20:15	05/11 20:15	MMD
Ethylbenzene	0.41		ug/L	0.13	0.39	524.2	05/11 20:15	05/11 20:15	MMD
Xylenes (Total)	2.11		ug/L	0.16	0.48	524.2	05/11 20:15	05/11 20:15	MMD
Styrene	U	U	ug/L	0.10	0.30	524.2	05/11 20:15	05/11 20:15	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.08	0.24	524.2	05/11 20:15	05/11 20:15	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.08	0.24	524.2	05/11 20:15	05/11 20:15	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.09	0.27	524.2	05/11 20:15	05/11 20:15	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				Dilution Factor = 1					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.04	0.12	525.2	05/11 08:54	05/11 21:20	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.01	0.03	525.2	05/11 08:54	05/11 21:20	AC
Benzo(a)pyrene	U	U	ug/L	0.01	0.03	525.2	05/11 08:54	05/11 21:20	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	05/11 08:54	05/11 21:20	AC
Alachlor	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:20	AC
Atrazine	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:20	AC

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Simazine	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:20	AC
552.2 Haloacetic Acids : 62-550.310(3)				Dilution Factor = 1					
Monochloroacetic Acid	U	U	ug/L	0.79	2.37	552.2	05/11 12:26	05/11 23:36	AC
Dichloroacetic Acid	U	U	ug/L	0.45	1.35	552.2	05/11 12:26	05/11 23:36	AC
Trichloroacetic Acid	U	U	ug/L	0.36	1.08	552.2	05/11 12:26	05/11 23:36	AC
Monobromoacetic Acid	U	U	ug/L	0.47	1.41	552.2	05/11 12:26	05/11 23:36	AC
Dibromoacetic Acid	U	U	ug/L	0.37	1.11	552.2	05/11 12:26	05/11 23:36	AC
Total Haloacetic Acids (HAA5)	U		ug/L			552.2	05/11 12:26	05/11 23:36	AC
SUB 300.1 Chlorite & Bromate (Combo Part B)				Dilution Factor = 250					
Chlorite	210U		ug/L	210.000	630.000	EPA 300.1	05/17 17:01	05/17 17:01	E83079
Bromate	U	U	ug/L	80.750	242.250	EPA 300.1	05/17 17:01	05/17 17:01	E83079
Gross Alpha	11.1 ± 1		pCi/L	0.3	0.9	EPA 00-02	05/17	05/19 08:00	E84025
Radium-226	6.6 ± 0.4		pCi/L	0.20	0.60	EPA 903.1	05/14	05/27 11:20	E84025
Radium-228	1.4 ± 0.9	I	pCi/L	1.00	3.00	EPA Ra-05	05/14	05/25 11:45	E84025

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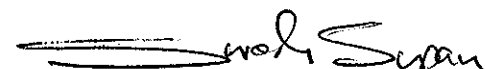
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LABORATORY ANALYSIS REPORT

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Strontium-90	U	U	pCi/L	1.00	3.00	EPA 905.0	05/14	05/24 08:41	E84025

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 this sample.
QC=Qualifier Codes as defined by DEP 62-160
U=Analyzed for but not detected.
Q=Sample held beyond accepted holding time.
I=Value is between MDL and PQL.
J=Estimated value.


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

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Submission # 1005000236
Order # 15887

Project: Hialeah DZMW
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Drinking Water

Sample I.D.: DZMW Lower
Collected: 05/10/10 09:00
Received: 05/10/10 16:10
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Coliform-Total (E-Coli)	P(A)		-----			9223B	05/10 17:00	05/11 17:00	DMB
pH (field)	7.65		units	0.1	0.3	150.1	05/10 09:00	05/10 09:00	Client
531.1 Carbamate Pesticides: 62-550 (Unregulated)			Dilution Factor = 1						
Aldicarb Sulfoxide	U	U	ug/L	0.37	1.11	531.1	05/13 14:14	05/13 14:14	CEB
Aldicarb Sulfone	U	U	ug/L	0.57	1.71	531.1	05/13 14:14	05/13 14:14	CEB
Methomyl	U	U	ug/L	0.26	0.78	531.1	05/13 14:14	05/13 14:14	CEB
3-Hydroxycarbofuran	U	U	ug/L	0.56	1.68	531.1	05/13 14:14	05/13 14:14	CEB
Aldicarb	U	U	ug/L	0.66	1.98	531.1	05/13 14:14	05/13 14:14	CEB
Carbaryl	U	U	ug/L	0.25	0.75	531.1	05/13 14:14	05/13 14:14	CEB
531.1 Carbamate Pesticides: 62-550.310(4)(b)			Dilution Factor = 1						
Carbofuran	U	U	ug/L	0.45	1.35	531.1	05/13 14:14	05/13 14:14	CEB
Oxamyl (Vydate)	U	U	ug/L	0.41	1.23	531.1	05/13 14:14	05/13 14:14	CEB
Glyphosate	U	U	ug/L	3.55	10.65	547	05/11 13:08	05/11 13:08	CEB
Endothall	U	U	ug/L	0.0046	0.0138	548.1	05/13 10:00	05/14 14:50	CEB
549.2 Diquat: 62-550.310(4)(b)			Dilution Factor = 1						
Diquat	U	U	ug/L	0.4	1.2	549.2	05/11 13:00	05/11 15:11	CEB
Chloride	17200		mg/L	62.00	186.00	300.0	05/11 18:11	05/11 18:11	DGK
Fluoride	1.87		mg/L	0.400	1.200	300.0	05/11 18:11	05/11 18:11	DGK

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

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Report Printed: 06/03/10
Submission # 1005000236
Order # 15887

Project: Hialeah DZMW
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Drinking Water

Sample I.D.: DZMW Lower
Collected: 05/10/10 09:00
Received: 05/10/10 16:10
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Nitrate (as N)	U	U	mg/L	0.050	0.150	300.0	05/11 18:11	05/11 18:11	DGK
Nitrate+ Nitrite (as N)	U	U	mg/L	0.006	0.018	300.0	05/11 18:11	05/11 18:11	DGK
Nitrite (as N)	U	U	mg/L	0.060	0.180	300.0	05/11 18:11	05/11 18:11	DGK
Sulfate	2020		mg/L	8.00	24.00	300.0	05/11 18:11	05/11 18:11	DGK
Cyanide, Total	U	U	mg/L	0.002	0.006	335.4	05/13 10:02	05/13 11:55	MSG
Color/pH (Lab)	5/7.81		Pt-Co	1.0	3.0	SM2120B	05/12 09:00	05/12 09:00	DGK
Odor (Lab) at 40 Degrees C	1		TON	1.0	3.0	SM2150B	05/10 17:55	05/10 17:55	RPV
Total Dissolved Solids (TDS)	33233		mg/L	1.00	3.00	SM 2540C	05/12 15:50	05/14 10:59	LYR
MBAS Surfactants	0.068	I	mg/L	0.033	0.099	SM5540C	05/11 15:21	05/11 15:21	DGK
Aluminum	0.026		mg/L	0.0007	0.0021	200.7	05/11	05/11 17:50	IMA
Copper	U	U	mg/L	0.0002	0.0006	200.7	05/10	05/11 17:50	IMA
Iron	0.205		mg/L	0.0008	0.0024	200.7	05/10	05/11 17:50	IMA
Manganese	0.001		mg/L	0.00009	0.00027	200.7	05/10	05/11 17:50	IMA
Silver	U	U	mg/L	0.0001	0.0003	200.7	05/10	05/11 17:50	IMA
Sodium	9330		mg/L	0.560	1.680	200.7	05/10	05/12 13:17	IMA
Zinc	U	U	mg/L	0.00050	0.00150	200.7	05/10	05/11 17:50	IMA
200.8 DW-10 Metals in Drinking Water 62-550.310				Dilution Factor = 10					
Arsenic	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Barium	0.0050		mg/L	0.00040	0.00120	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Cadmium	U	U	mg/L	0.00080	0.00240	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Chromium	U	U	mg/L	0.0010	0.0030	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Lead	0.0027		mg/L	0.00060	0.00180	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Nickel	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Selenium	U	U	mg/L	0.0090	0.0270	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Antimony	U	U	mg/L	0.0020	0.0060	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Beryllium	U	U	mg/L	0.00030	0.00090	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Thallium	U	U	mg/L	0.00004	0.00012	4.1.3/200.8	05/11 09:00	05/11 12:00	IMN
Mercury	U	U	mg/L	0.00007	0.00021	245.1	05/11	05/11 16:22	EN
504.1 EDB, DBCP: 62-550.310(4)(b)			Dilution Factor = 1						
1,2-Dibromo-3-Chloropropane (DBCP)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	05/1209:30	05/12 18:14	MD
Ethylene Dibromide (EDB)	U	U	ug/L	0.006	0.018	EPA 504.1 ECD	05/1209:30	05/12 18:14	MD
508 Pesticides & PCBs: 62-550.310(4)(b)			Dilution Factor = 1						
Hexachlorocyclopentadiene	U	U	ug/L	0.010	0.030	508	05/13 09:54	05/14 09:54	AC
Hexachlorobenzene	U	U	ug/L	0.009	0.027	508	05/13 09:54	05/14 09:54	AC
g-BHC (Lindane)	U	U	ug/L	0.012	0.036	508	05/13 09:54	05/14 09:54	AC
Heptachlor	U	U	ug/L	0.012	0.036	508	05/13 09:54	05/14 09:54	AC

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Project: Hialeah DZMW
Site Location: 16500 NW 97th Avenue, Hialeah, FL
Matrix: Drinking Water

Sample I.D.: DZMW Lower
Collected: 05/10/10 09:00
Received: 05/10/10 16:10
Collected by: Cameron Webster

LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Heptachlor Epoxide	U	U	ug/L	0.011	0.033	508	05/13 09:54	05/14 09:54	AC
Endrin	U	U	ug/L	0.010	0.030	508	05/13 09:54	05/14 09:54	AC
Methoxychlor	U	U	ug/L	0.013	0.039	508	05/13 09:54	05/14 09:54	AC
Arochlor 1016	U	U	ug/L	0.052	0.156	508	05/13 09:54	05/14 09:54	AC
Arochlor 1221	U	U	ug/L	0.021	0.063	508	05/13 09:54	05/14 09:54	AC
Arochlor 1232	U	U	ug/L	0.025	0.075	508	05/13 09:54	05/14 09:54	AC
Arochlor 1242	U	U	ug/L	0.019	0.057	508	05/13 09:54	05/14 09:54	AC
Arochlor 1248	U	U	ug/L	0.034	0.102	508	05/13 09:54	05/14 09:54	AC
Arochlor 1254	U	U	ug/L	0.024	0.072	508	05/13 09:54	05/14 09:54	AC
Arochlor 1260	U	U	ug/L	0.027	0.081	508	05/13 09:54	05/14 09:54	AC
Toxaphene	U	U	ug/L	0.21	0.63	508	05/13 09:54	05/14 09:54	AC
Chlordane	U	U	ug/L	0.03	0.09	508	05/13 09:54	05/14 09:54	AC
515.3 Chlorophenoxy Herbicides 62-550 (Reg)				Dilution Factor = 1					
Dalapon	U	U	ug/L	0.09	0.27	515.3	05/12 09:42	05/13 09:42	AC
2,4-D	U	U	ug/L	0.08	0.24	515.3	05/12 09:42	05/13 09:42	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	515.3	05/12 09:42	05/13 09:42	AC
2,4,5-TP (silvex)	U	U	ug/L	0.04	0.12	515.3	05/12 09:42	05/13 09:42	AC
Dinoseb	U	U	ug/L	0.11	0.33	515.3	05/12 09:42	05/13 09:42	AC

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PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Picloram	U	U	ug/L	0.06	0.18	515.3	05/12 09:42	05/13 09:42	AC
524.2 Trihalomethanes: 62-550.310(3) THMs			Dilution Factor = 1						
Bromodichloromethane	U	U	ug/L	0.25	0.75	524.2	05/11 20:46	05/11 20:46	MMD
Dibromochloromethane	U	U	ug/L	0.13	0.39	524.2	05/11 20:46	05/11 20:46	MMD
Tribromomethane (Bromoform)	U	U	ug/L	0.43	1.29	524.2	05/11 20:46	05/11 20:46	MMD
Trichloromethane (Chloroform)	0.23	I	ug/L	0.13	0.39	524.2	05/11 20:46	05/11 20:46	MMD
TOTAL Trihalomethanes	0.2		ug/L			524.2	05/11 20:46	05/11 20:46	MMD
524.2 Volatile Organics: 62-550.310(4)(a)			Dilution Factor = 1						
Vinyl Chloride	U	U	ug/L	0.31	0.93	524.2	05/11 20:46	05/11 20:46	MMD
1,1-Dichloroethylene	U	U	ug/L	0.18	0.54	524.2	05/11 20:46	05/11 20:46	MMD
Dichloromethane (Methylene Chloride)	U	U	ug/L	0.14	0.42	524.2	05/11 20:46	05/11 20:46	MMD
Trans-1,2-Dichloroethylene	U	U	ug/L	0.08	0.24	524.2	05/11 20:46	05/11 20:46	MMD
Cis-1,2-Dichloroethylene	U	U	ug/L	0.11	0.33	524.2	05/11 20:46	05/11 20:46	MMD
1,1,1-Trichloroethane	U	U	ug/L	0.16	0.48	524.2	05/11 20:46	05/11 20:46	MMD
Carbon Tetrachloride	U	U	ug/L	0.15	0.45	524.2	05/11 20:46	05/11 20:46	MMD
Benzene	U	U	ug/L	0.11	0.33	524.2	05/11 20:46	05/11 20:46	MMD
1,2-Dichloroethane	U	U	ug/L	0.08	0.24	524.2	05/11 20:46	05/11 20:46	MMD
Trichloroethylene	U	U	ug/L	0.16	0.48	524.2	05/11 20:46	05/11 20:46	MMD

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1,2-Dichloropropane	U	U	ug/L	0.14	0.42	524.2	05/11 20:46	05/11 20:46	MMD
Toluene	0.44		ug/L	0.08	0.24	524.2	05/11 20:46	05/11 20:46	MMD
1,1,2-Trichloroethane	U	U	ug/L	0.20	0.60	524.2	05/11 20:46	05/11 20:46	MMD
Tetrachloroethylene	U	U	ug/L	0.29	0.87	524.2	05/11 20:46	05/11 20:46	MMD
Chlorobenzene	U	U	ug/L	0.11	0.33	524.2	05/11 20:46	05/11 20:46	MMD
Ethylbenzene	0.17	I	ug/L	0.13	0.39	524.2	05/11 20:46	05/11 20:46	MMD
Xylenes (Total)	0.82		ug/L	0.16	0.48	524.2	05/11 20:46	05/11 20:46	MMD
Styrene	U	U	ug/L	0.10	0.30	524.2	05/11 20:46	05/11 20:46	MMD
1,4-Dichlorobenzene (para)	U	U	ug/L	0.08	0.24	524.2	05/11 20:46	05/11 20:46	MMD
1,2-Dichlorobenzene (ortho)	U	U	ug/L	0.08	0.24	524.2	05/11 20:46	05/11 20:46	MMD
1,2,4-Trichlorobenzene	U	U	ug/L	0.09	0.27	524.2	05/11 20:46	05/11 20:46	MMD
525.2 Semivolatile Organics: 62-550.310(4)(b)				Dilution Factor = 1					
Di(2-Ethylhexyl)phthalate	U	U	ug/L	0.04	0.12	525.2	05/11 08:54	05/11 21:48	AC
Di(2-Ethylhexyl)adipate	U	U	ug/L	0.01	0.03	525.2	05/11 08:54	05/11 21:48	AC
Benzo(a)pyrene	U	U	ug/L	0.01	0.03	525.2	05/11 08:54	05/11 21:48	AC
Pentachlorophenol	U	U	ug/L	0.02	0.06	525.2	05/11 08:54	05/11 21:48	AC
Alachlor	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:48	AC
Atrazine	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:48	AC

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LABORATORY ANALYSIS REPORT

PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Simazine	U	U	ug/L	0.03	0.09	525.2	05/11 08:54	05/11 21:48	AC
552.2 Haloacetic Acids : 62-550.310(3)			Dilution Factor =1						
Monochloroacetic Acid	U	U	ug/L	0.79	2.37	552.2	05/11 12:26	05/11 23:58	AC
Dichloroacetic Acid	U	U	ug/L	0.45	1.35	552.2	05/11 12:26	05/11 23:58	AC
Trichloroacetic Acid	5.01		ug/L	0.36	1.08	552.2	05/11 12:26	05/11 23:58	AC
Monobromoacetic Acid	U	U	ug/L	0.47	1.41	552.2	05/11 12:26	05/11 23:58	AC
Dibromoacetic Acid	U	U	ug/L	0.37	1.11	552.2	05/11 12:26	05/11 23:58	AC
Total Haloacetic Acids (HAA5)	5.0		ug/L			552.2	05/11 12:26	05/11 23:58	AC
SUB 300.1 Chlorite & Bromate (Combo Part B)			Dilution Factor =250						
Chlorite	210U		ug/L	210.000	630.000	EPA 300.1	05/17 18:54	05/17 18:54	E83079
Bromate	U	U	ug/L	80.750	242.250	EPA 300.1	05/17 18:54	05/17 18:54	E83079
Gross Alpha	7.1 ± 0.8		pCi/L	0.3	0.9	EPA 00-02	05/17	05/19 08:00	E84025
Radium-226	4.6 ± 0.4		pCi/L	0.20	0.60	EPA 903.1	05/14	05/27 11:20	E84025
Radium-228	U	U	pCi/L	1.00	3.00	EPA Ra-05	05/14	05/25 13:30	E84025

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PARAMETER	RESULT	QC	UNITS	MDL	PQL	METHOD	DATE EXT.	DATE ANALY.	ANALYST
Strontium-90	U	U	pCi/L	1.00	3.00	EPA 905.0	05/14	05/24 08:41	E84025

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 this sample.
QC=Qualifier Codes as defined by DEP 62-160
U=Analyzed for but not detected.
Q=Sample held beyond accepted holding time.
I=Value is between MDL and PQL.
J=Estimated value.


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

Appendix L



Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

May 24, 2010
File Number 10-023

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

Attention: Katie Wallace

Subject: Rock Core Testing, City of Hialeah RO Injection Wells

Gentlemen:

As requested, vertical and horizontal permeability, unconfined compression and specific gravity tests have been completed on rock cores provided for testing by your firm. The samples were received on February 5, 2010. The designations of the 28 samples are listed below.

Well	Core	Depth (feet)	Well	Core	Depth (feet)
IW-1	1	2206.5-2207.1	IW-2	1	1955.6-1956.2
		2708.6-2209.2			1960.4-1961.1
	2	2304.5-2304.9			1966.8-1967.2
		2306.8-2307.4		2	2053.7-2054.5
		2311.8-2312.4			2058.9-2059.5
	3	2507.1-2507.5			2062.6-2063.9
		2508.6-2509.0		3	2101.3-2101.7
		2510.8-2511.5			2102.5-2102.9
	4	2733.9-2734.3			2105.9-2106.4
		2739.0-2739.4		4	2435.8-2436.2
		2743.3-2743.7			2438.9-2439.3
	5	2819.4-2819.9			2440.9-2441.5
		2827.6-2828.1		5	2781.5-2781.9
		2829.8-2830.2			2782.5-2782.9

Permeability Tests

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 either the constant head (Method A) or the constant volume; falling head/rising tailwater (Method F) test method. The permeability test results are presented on the attached hydraulic conductivity test reports. A total of 48 permeability tests were performed.

Unconfined Compression Tests

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. Unconfined compression tests were performed on seven samples.


Specific Gravity

The measured mineral specific gravities 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" using 40 to 95 gram specimens ground to pass the U.S. Standard No. 40 sieve. A total of 27 specific gravity tests were performed.

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.

Please contact us if you have any questions about the test results or require additional information.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.



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

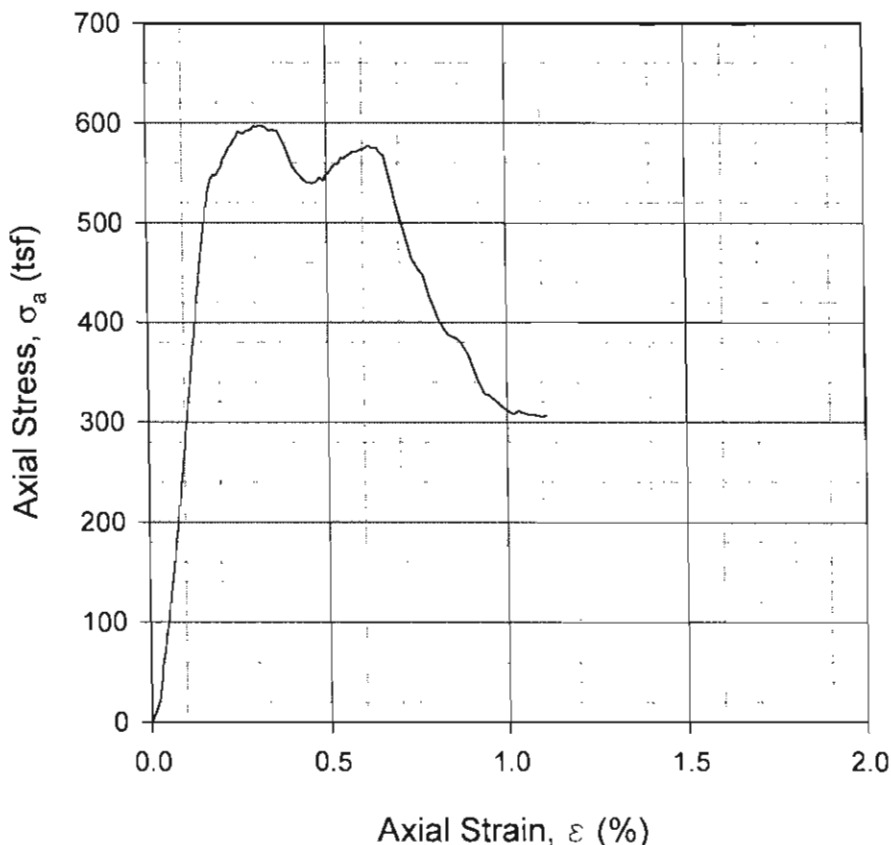
ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10
 DATE TEST SET-UP: 03/02/10
 DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: IW-1 Core 2
 BORING - _____ SAMPLE - _____
 DEPTH 2306.8-2307.4 ft; □ m
 LABORATORY IDENTIFICATION NO.: 10023/1C2B
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, hard, dense

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 (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.89	5.03	2.2	1.5	161.2	46	0.012	0.108	2.9	8290	5.5x10 ⁶ at 50% σ_a (ult)



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 21

Capping Material: ☐ None
☒ Lab-Stone
☐ Sulfur

Comments: _____

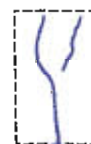
SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing:
☒ Yes
☐ No

G_s: 2.82 ☐ Assumed
☒ Measured

FAILURE SKETCH



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; w_c = Moisture content (ASTM D 2218); γ_d = Dry density; S = Saturation; $\dot{\epsilon}$ = Vertical displacement rate; and G_s = Specific gravity.

Checked By: TM Date: 05/24/10

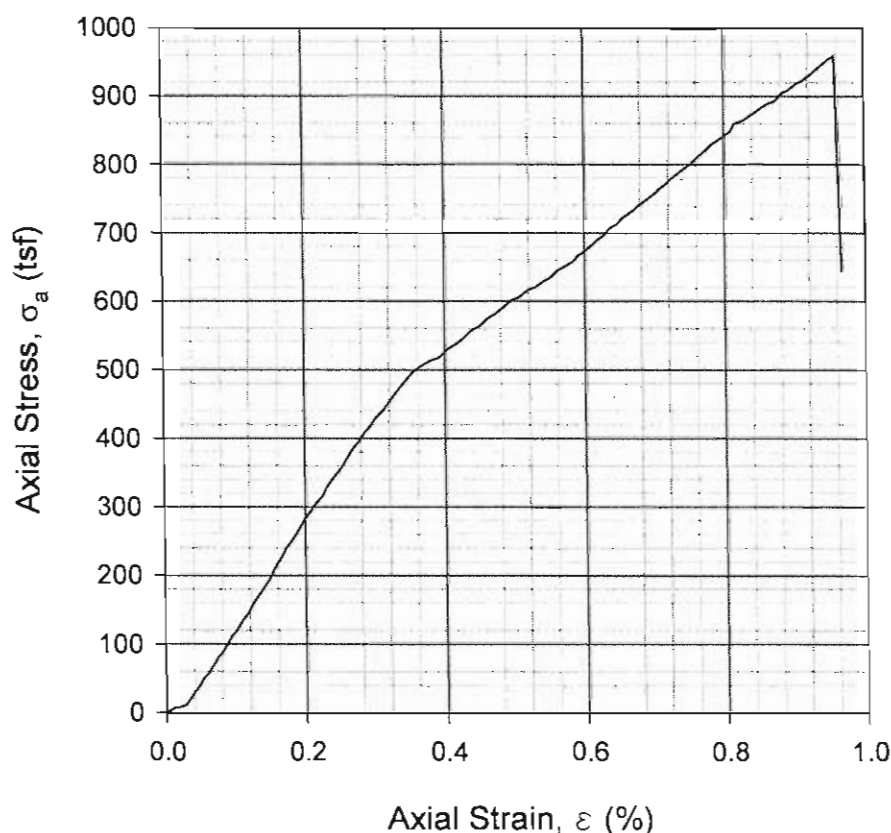
ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
PROJECT: City of Hialeah RO Injection Wells
FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10
DATE TEST SET-UP: 03/02/10
DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: 1W-1 Core 2
BORING - _____ SAMPLE - _____
DEPTH 2311.8-2312.4 _____ ☒ ft; ☐ m
LABORATORY IDENTIFICATION NO.: 10023/1C2C
SAMPLE DESCRIPTION: Dolostone: brown, hard,
dense

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 (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.46	5.02	2.1	1.3	160.9	40	0.025	0.24	4.0	13,300	2.1×10^6 at 40% σ_a (ult)



TEST PROCEDURES

☒ ASTM Standard D 7012,
Method C

Air Temperature (°C): 21

Capping Material: ☐ None
☒ Lab-Stone
☐ Sulfur

Comments: _____

SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing:
☒ Yes
☐ No

G_s : 2.82 ☐ Assumed
☒ Measured

FAILURE SKETCH



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

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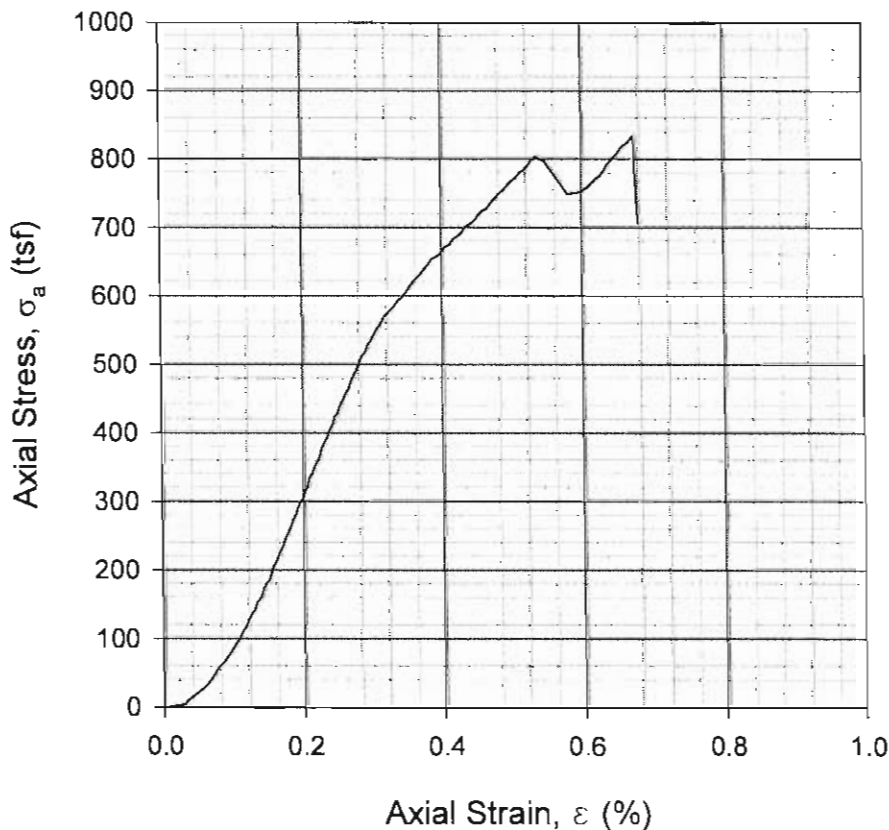
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10
 DATE TEST SET-UP: 03/02/10
 DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: IW-1 Core 3
 BORING - _____ SAMPLE - _____
 DEPTH 2510.8-2511.5 ft; □ m
 LABORATORY IDENTIFICATION NO.: 10023/1C3C
 SAMPLE DESCRIPTION: Dolostone: very pale brown,
hard, dense

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, $\sigma_a(ult)$ (lb/in ²)	Young's Modulus, E (lb/in ²)
H (cm)	D (cm)	H/D	w _s (%)	γ_d (lb/ft ³)	S (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.11	5.05	2.0	0.8	170.3	53	0.017	0.168	4.0	11,600	3.4×10^6 at 50% $\sigma_a(ult)$



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 21

Capping Material: ☐ None
☒ Lab-Stone
☐ Sulfur

Comments: _____

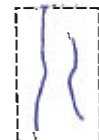
SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing:
☒ Yes
☐ No

G_s: 2.85 ☐ Assumed
☒ Measured

FAILURE SKETCH



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

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ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

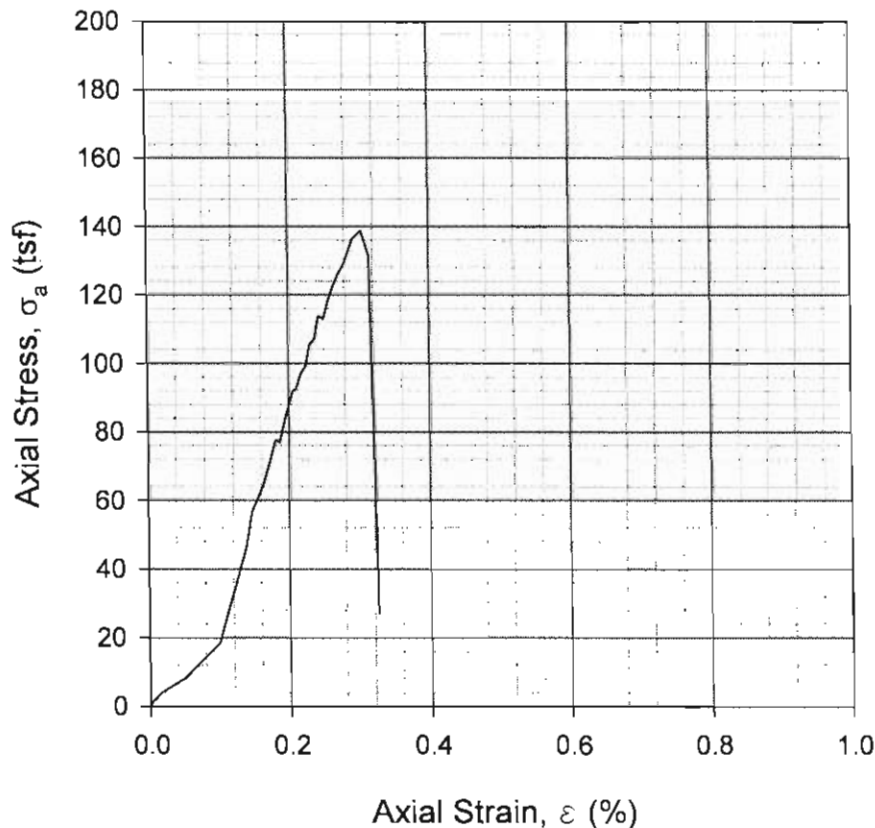
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10
 DATE TEST SET-UP: 03/02/10
 DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: IW-1 Core 4
 BORING - _____ SAMPLE - _____
 DEPTH 2739.0-2739.4 ft; □ m
 LABORATORY IDENTIFICATION NO.: 10023/1C4B
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard grainstone

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, $\sigma_a(ult)$ (lb/in ²)	Young's Modulus, E (lb/in ²)
H (cm)	D (cm)	H/D	w _c (%)	γ_d (lb/ft ³)	S (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.21	5.01	2.0	8.8	120.9	59	0.034	0.34	1.0	1930	8.1×10^5 at 50% $\sigma_a(ult)$



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 21

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



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

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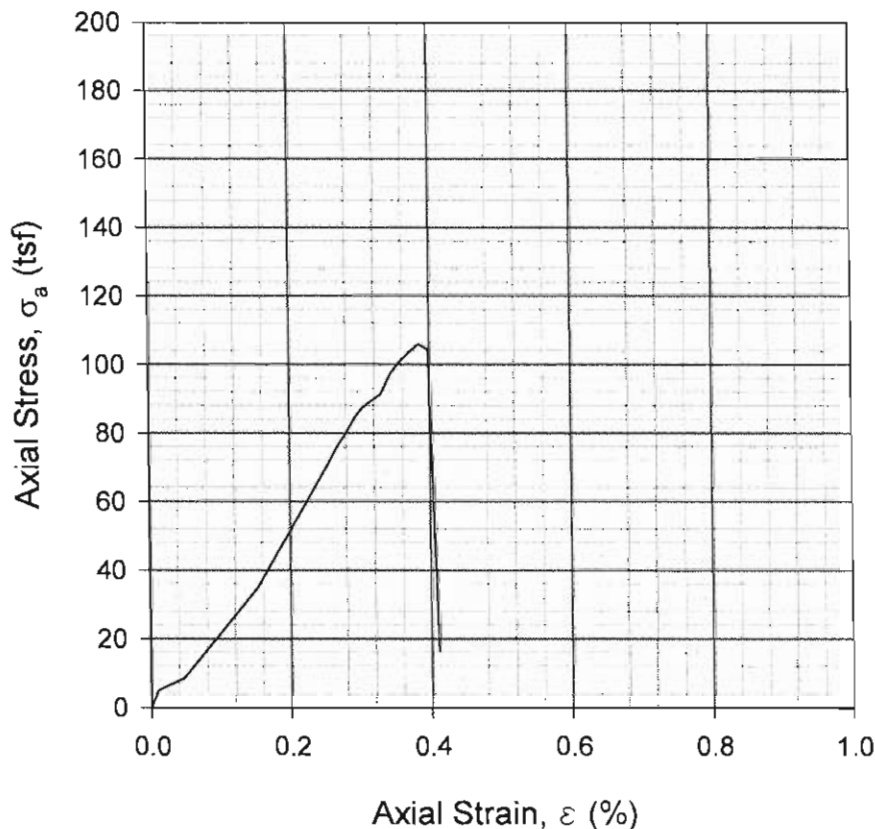
INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10
 DATE TEST SET-UP: 03/02/10
 DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: IW-2 Core 1
 BORING - _____ SAMPLE - _____
 DEPTH 1966.8-1967.2 ft; □ m
 LABORATORY IDENTIFICATION NO.: 10023/2C1C
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard packstone

Specimen Dimensions			Initial Conditions			Rate of Loading		Time to Failure (minutes)	Unconfined Compressive Strength, $\sigma_a(ult)$ (lb/in ²)	Young's Modulus, E (lb/in ²)
H (cm)	D (cm)	H/D	w _c (%)	γ_d (lb/ft ³)	S (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.27	5.04	2.0	17.6	107.6	83	0.040	0.38	1.0	1470	5.5×10^5 at 50% $\sigma_a(ult)$



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 21

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



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

Checked By: jm Date: 05/24/10

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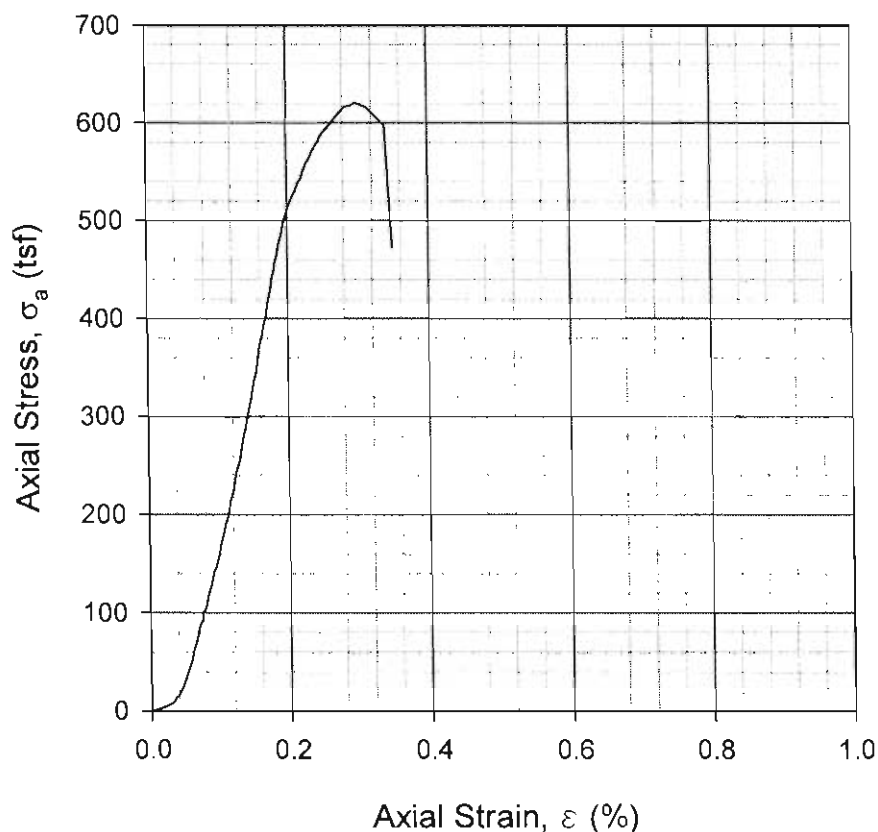
ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

INTACT ROCK CORE UNCONFINED COMPRESSION TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10
 DATE TEST SET-UP: 03/02/10
 DATE REPORTED: 05/24/10

INCOMING SAMPLE NO.: **IW-2 Core 4**
 BORING - _____ SAMPLE - _____
 DEPTH 2440.9-2441.5 _____ ft; □ m
 LABORATORY IDENTIFICATION NO.: 10023/2C4C
 SAMPLE DESCRIPTION: Dolostone: brown, very hard,
 finely crystalline

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 (%)	$\dot{\epsilon}$ (cm/minute)	$\dot{\epsilon}$ (%/minute)			
10.36	5.03	2.1	1.0	168.9	60	0.008	0.075	4.0	8620	5.1x10 ⁶ at 50% σ_a (ult)



TEST PROCEDURES

☒ ASTM Standard D 7012, Method C

Air Temperature (°C): 21

Capping Material: ☐ None
☒ Lab-Stone
☐ Sulfur

Comments: _____

SPECIMEN PREPARATION

Original Core Diameter (inch): 4

Specimen Sub-Cored for Testing:
☒ Yes
☐ No

G_s: 2.83 ☐ Assumed
☒ Measured

FAILURE SKETCH



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

Checked By: TM Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 1, 2206.5'-2207.1'
 LABORATORY IDENTIFICATION NO.: 10023/1-1AV
 SAMPLE DESCRIPTION: Limestone: light gray, moderately hard grainstone

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: 92 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 7, 12

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 7.1/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.70 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.34	9.78	776.29	17.5	113.1	0.329	97	30	160	25	0.9	1	1406.4	17.5	97	4.9 x 10 ⁻⁶

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

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 Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RQ Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 1, 2206.5'-2207.1'
 LABORATORY IDENTIFICATION NO.: 10023/1-1AH
 SAMPLE DESCRIPTION: Limestone; light gray, moderately hard grainstone

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: 84 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi) 10, 17, 24, 32

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.1/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.70 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.79	4.72	118.84	17.5	113.5	0.327	98	30	160	98	1.3	1	216.09	17.5	98	6.1 x 10 ⁻⁶

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/19/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 1, 2208.6'-2209.2'
 LABORATORY IDENTIFICATION NO.: 10023/1-1BV
 SAMPLE DESCRIPTION: Limestone: grayish-brown, moderately hard
grainstone

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: 94 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 11, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 7.8/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.72	10.08	855.17	16.0	116.5	0.314	95	30	160	21	3.2	1	1596.1	16.0	95	5.1 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RQ Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 1, 2208.6'-2209.2'
 LABORATORY IDENTIFICATION NO.: 10023/1-1BH
 SAMPLE DESCRIPTION: Limestone: grayish brown, moderately hard
grainstone

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: 86 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 9, 18, 25

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.8/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.55	4.71	131.58	16.0	118.0	0.305	100	30	160	21	2.1	1	248.89	16.0	100	8.7 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: JM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/15/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2304.5'-2304.9'
 LABORATORY IDENTIFICATION NO.: 10023/1-2AV
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, hard, dense

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: 92 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 8, 15, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 5.0/3.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
8.11	10.026	640.17	4.4	156.1	0.113	98	30	160	86	1.3	1	1601.6	4.5	100	2.6 x 10 ⁻⁹
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 assumption of 100% saturation. WDS calculated from measured wet weight and calculated w _c . * First length is total sample length. Second length is useable length at full core diameter.															
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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.															

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 03/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2304.5'-2304.9'
 LABORATORY IDENTIFICATION NO.: 10023/1-2AH
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, hard, dense

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: 71 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 13, 21, 26

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 5.0/3.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.79	5.03	154.60	4.4	154.6	0.121	91	30	160	104	0.39	1	383.06	4.7	96	4.7 x 10 ⁻⁷

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2306.8'-2307.4'
 LABORATORY IDENTIFICATION NO.: 10023/1-2BV
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, hard, dense

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: 91 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 8, 16, 29, 38

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 7.5/6.5* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.04	10.02	138.76	9.5	138.8	0.211	100	30	160	33	0.88	1	1234.6	9.5	100	5.8 x 10 ⁻⁶

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2306.8'-2307.4'
 LABORATORY IDENTIFICATION NO.: 10023/1-2BH
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, hard, dense

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: 93 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 10, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.5/6.5* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
4.81	4.99	94.05	9.5	138.1	0.215	98	30	160	114	1.6	1	208.06	9.5	98	1.0 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: PM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Hialeah RO Injection Wells

FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10

DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2311.8'-2312.4'

LABORATORY IDENTIFICATION NO.: 10023/1-2CV

SAMPLE DESCRIPTION: Dolostone: brown, hard, dense

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: 86 (stable) % ☐ Beginning of Test;

☒ End of Test

$\Delta\sigma_c$ (psi): 10, 17, 22

SPECIMEN DATA:

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

As-Received Length (inch): 7.6/6.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
5.89	10.04	466.57	3.1	159.6	0.093	84	30	160	46	2.2	1	1193.1	3.2	88	3.2 x 10 ⁻⁶

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 .
* First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 05/24/10
Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 2, 2311.8'-2312.4'
 LABORATORY IDENTIFICATION NO.: 10023/1-2CH
 SAMPLE DESCRIPTION: Dolostone: brown, hard, dense

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: 64 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi) 6, 11, 18

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.6/6.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.82 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.13	5.04	142.13	3.0	160.9	0.086	89	30	160	95	1.0	1	366.46	3.2	97	2.9 x 10⁻⁷

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 3, 2507.1'-2507.5'
 LABORATORY IDENTIFICATION NO.: 10023/1-3AV
 SAMPLE DESCRIPTION: Dolostone: very dark gray, hard, dense
(specimen contains vertical fissures)

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): 18, 23, 27, 33

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.3/4.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.04	7.93	627.93	0.5	169.6	0.040	33	30	160	88	0.81	4	1706.3	0.5	36	2.1 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 3, 2507.1'-2507.5'
 LABORATORY IDENTIFICATION NO.: 10023/1-3AH
 SAMPLE DESCRIPTION: Dolstone; very dark gray, hard, dense

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): 12, 22, 27

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.3/4.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
H (cm)	D (cm)	V (cm ³)	w_e (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm ³)	t (days)	WDS (g)	w_e (%)	S (%)	
6.77	5.02	134.03	0.5	170.4	0.035	41	30	160	86	0.77	8	365.99	0.5	41	2.9 x 10 ⁻⁹

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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_e = 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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 3, 2508.6'-2509.0'
 LABORATORY IDENTIFICATION NO.: 10023/1-3BV
 SAMPLE DESCRIPTION: Dolostone: very dark gray, hard, dense

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): 5

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 6.1/4.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.77	10.03	850.09	1.7	164.2	0.070	65	30	160	62	0.31	14	2237.1	1.7	66	4.4 x 10 ⁻¹⁰

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 3, 2508.6'-2509.0'
 LABORATORY IDENTIFICATION NO.: 10023/1-3BH
 SAMPLE DESCRIPTION: Dolostone: very dark gray, hard, dense

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: 84 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 11, 20, 26

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 6.1/4.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.73	5.03	153.63	1.6	167.6	0.051	86	30	160	181	5.7	7	412.53	1.7	92	4.6 x 10 ⁻⁹

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

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

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Hialeah RO Injection Wells

FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10

DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: **IW-1, Core 3, 2510.8'-2511.5'**

LABORATORY IDENTIFICATION NO.: 10023/3CV

SAMPLE DESCRIPTION: Dolostone: very pale brown, hard, dense

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: 49 (stable) % □ Beginning of Test;

☒ End of Test $\Delta\sigma_c$ (psi): 11, 17, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4

As-Received Length (inch): 8.8/7.0*

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.85 ☐ Assumed

☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
H (cm)	D (cm)	V (cm ³)	w _c (%)	Y _d (pcf)	n	S (%)	$\bar{\sigma}_e$ (psi)	u _b (psi)	i _{avg}	Q (cm ³)	t (days)	WDS (g)	w _c (%)	S (%)	
8.07	9.94	626.37	0.7	171.2	0.037	54	30	70	38	0.60	35	1718.4	0.9	66	1.5 x 10-10
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 . * First length is total sample length. Second length is useable length at full core diameter.															
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); Y _d = Dry density; S = Saturation; $\bar{\sigma}_e$ = Isotropic effective confining stress; u _b = Back-pressure; i _{avg} = Average hydraulic gradient; Q = Flow volume; t = Test duration; k ₂₀ = Saturated hydraulic conductivity at 20°C; n = Total porosity; and G _s = Specific gravity.															

Checked By: TM
Form SR-2B; Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 03/19/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 3, 2510.8'-2511.5'
 LABORATORY IDENTIFICATION NO.: 10023/3CH
 SAMPLE DESCRIPTION: Dolostone: very pale brown, hard, dense

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: 36 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 6, 10, 17

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 8.8/7.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

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

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.65	5.06	133.46	0.9	171.4	0.036	67	30	70	57	0.20	11	366.53	0.9	67	2.4 x 10-10

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 4, 2733.9'-2734.3'
 LABORATORY IDENTIFICATION NO.: 10023/1-4AV
 SAMPLE DESCRIPTION: Limestone; very pale brown, moderately hard
grainstone

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: 93 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 6, 8

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 5.1/2.8* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.98	10.00	547.89	11.4	128.1	0.245	96	30	160	19	7.5	1	1124.8	11.5	97	1.6 x 10⁻⁴
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 . * First length is total sample length. Second length is useable length at full core diameter.															
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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.															

Checked By: PM Date: 05/24/10
 Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 4, 2733.9'-2734.3'
 LABORATORY IDENTIFICATION NO.: 10023/1-4AH
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard
grainstone

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: 94 (stable) %

- ☐ Beginning of Test;
- ☒ End of Test

$\Delta\sigma_c$ (psi) 13, 21, 26

SPECIMEN DATA:

As-Received Diameter (inch): 4
 As-Received Length (inch): 5.1/2.8*

Diameter Trimmed: ☒ Yes ☐ No
 Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION:

☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72

☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water

☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.37	4.74	112.23	11.4	129.2	0.239	99	30	160	43	0.80	1	232.39	11.5	100	1.4 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 4, 2743.3'-2743.7'
 LABORATORY IDENTIFICATION NO.: 10023/1-4CV
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard
packstone

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): 7, 13

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.9/3.7* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.73 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
9.25	9.98	722.80	15.6	119.3	0.300	99	30	160	22	1.4	2	1381.4	15.6	99	2.1 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 4, 2743.3'-2743.7'
 LABORATORY IDENTIFICATION NO.: 10023/1-4CH
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard
packstone

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: 91 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 10, 16, 23, 28

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.9/3.7* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.73 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.45	4.34	95.36	15.6	116.3	0.317	92	30	160	28	2.9	1	177.78	15.6	92	7.9 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: JM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 5, 2819.4'-2819.9'
 LABORATORY IDENTIFICATION NO.: 10023/1-5AV
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard
grainstone

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: 100 % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 12

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 6.0/4.1* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.74 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.25	9.89	787.76	19.6	108.4	0.366	93	30	160	21	7.3	1	1368.0	19.7	93	1.4 x 10⁻⁴

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 5, 2819.4'-2819.9'
 LABORATORY IDENTIFICATION NO.: 10023/1-5AH
 SAMPLE DESCRIPTION: Limestone: very pale brown moderately hard
grainstone

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): 10, 17, 24, 32

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 6.0/4.1* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.74 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.07	4.85	130.45	18.6	110.5	0.354	93	30	160	25	3.0	1	230.96	19.7	98	2.1 x 10⁻⁴

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Hialeah RO Injection Wells

FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10

DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 5, 2827.6'-2828.1'

LABORATORY IDENTIFICATION NO.: 10023/1-5BV

SAMPLE DESCRIPTION: Limestone: gray, moderately hard packstone

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: 81 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 9, 15, 21

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 5.5/4.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.87	9.96	847.58	12.1	126.4	0.253	97	30	160	64	0.80	1	1716.3	12.1	97	2.8 x 10⁻⁸

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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 5, 2827.6'-2828.1'
 LABORATORY IDENTIFICATION NO.: 10023/1-5BH
 SAMPLE DESCRIPTION: Limestone: gray, moderately hard packstone

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): 9, 16, 23, 28

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 5.5/4.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.08	4.95	136.31	12.0	125.9	0.256	94	30	160	96	0.76	1	274.95	12.1	96	5.6 x 10⁻⁷

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/19/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-1, Core 5, 2829.8'-2830.2'
 LABORATORY IDENTIFICATION NO.: 10023/1-5CV
 SAMPLE DESCRIPTION: Limestone: gray, moderately hard packstone to wackestone

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: 63 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 9, 17, 24, 32

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.0/0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ 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)
6.62	5.06	132.96	10.1	133.0	0.216	99	30	160	106	0.31	2	283.40	10.1	99	1.5 x 10⁻⁸

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: PM Date: 05/24/10
 Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Younquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 1, 1955.6-1956.2'
 LABORATORY IDENTIFICATION NO.: 10023/2-1AV
 SAMPLE DESCRIPTION: Limestone; very pale brown, moderately hard
packstone

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: 91 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 11, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 7.5/6.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.70 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.71	10.05	849.39	21.4	105.4	0.374	97	30	160	19	2.3	1	1435.3	21.4	97	3.9 x 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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: IM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 1, 1955.6'-1956.2'
 LABORATORY IDENTIFICATION NO.: 10023/2-1AH
 SAMPLE DESCRIPTION: Limestone; very pale brown, moderately hard
packstone

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: 79 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 9, 18, 25

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.5/6.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.70 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.89	4.56	112.36	21.3	106.6	0.367	99	30	160	27	3.2	1	191.99	21.4	100	8.1 x 10⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 1, 1960.4'-1961.1'
 LABORATORY IDENTIFICATION NO.: 10023/2-1BV
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard
packstone

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): 7, 14, 20

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 7.4/5.4* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.69 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.93	10.04	858.68	20.2	107.5	0.360	97	30	160	25	1.1	1	1478.9	20.2	97	3.9 x 10 ⁻⁶

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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 1, 1960.4'-1961.1'
 LABORATORY IDENTIFICATION NO.: 10023/2-1BH
 SAMPLE DESCRIPTION: Limestone: very pale brown, moderately hard,
packstone

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): 13, 21, 26

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.4/5.4* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.69 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
H (cm)	D (cm)	V (cm ³)	w _e (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm ³)	t (days)	WDS (g)	w _e (%)	S (%)	
6.85	4.70	118.74	18.6	108.5	0.354	91	30	160	39	0.66	1	206.38	20.2	99	1.7x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_e = 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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc. INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2053.7'-2054.5'
 PROJECT: City of Hialeah RO Injection Wells LABORATORY IDENTIFICATION NO.: 10023/2-2AV
 FILE NO.: 10-023 SAMPLE DESCRIPTION: Limestone: light brownish-gray, moderately hard
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10 grainstone
 DATE REPORTED: 05/24/10

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: 87 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 4, 11, 17

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 10.6/8.8* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.17	10.06	807.23	23.3	102.5	0.396	97	30	160	15	10.6	1	1326.5	23.3	97	2.1 x 10⁻⁴
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 . * First length is total sample length. Second length is useable length at full core diameter.															
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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.															

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2053.7'-2054.5'
 LABORATORY IDENTIFICATION NO.: 10023/2-2AH
 SAMPLE DESCRIPTION: Limestone: light brownish-gray, moderately hard grainstone

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: 92 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 10, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 10.6/8.8* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.30	4.52	100.85	23.3	103.1	0.393	98	30	160	17	5.3	1	166.62	23.3	98	3.7×10^{-4}

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.

PROJECT: City of Hialeah RO Injection Wells

FILE NO.: 10-023

DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10

DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2058.9'-2059.5'

LABORATORY IDENTIFICATION NO.: 10023/2-2BV

SAMPLE DESCRIPTION: Limestone: light grayish-brown, slightly friable
grainstone

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: 91 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 4, 11, 17

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
As-Received Length (inch): 7.5/6.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
11.26	10.04	891.89	22.4	105.3	0.379	100	30	160	19	13.2	1	1505.5	22.4	100	2.5 x 10⁻⁴

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 .
* First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 05/24/10
Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2058.9'-2059.5'
 LABORATORY IDENTIFICATION NO.: 10023/2-2BH
 SAMPLE DESCRIPTION: Limestone: light grayish-brown, slightly friable grainstone

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: 92 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi) 10, 17, 24, 32

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 7.5/6.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ 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)
6.24	4.63	105.06	22.4	104.7	0.383	98	30	160	28	16.4	1	176.22	22.4	98	6.0 x 10⁻⁴

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: PM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2062.6'-2063.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-2CV
 SAMPLE DESCRIPTION: Limestone: very pale brown, slightly friable
grainstone

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): 8, 17, 29, 38

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 8.3/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☒ Assumed
☐ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.70	10.06	849.75	16.4	118.9	0.327	96	30	160	24	1.6	1	1619.2	16.4	96	1.2 x 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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: PM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 2, 2062.6'-2063.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-2CH
 SAMPLE DESCRIPTION: Limestone: very pale brown, slightly friable
grainstone

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): 13, 21, 26

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 8.3/5.3* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☒ Assumed
☐ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm ³)	w _e (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm ³)	t (days)	WDS (g)	w _e (%)	S (%)	k_{20} (cm/sec)
6.15	4.40	93.37	16.4	120.5	0.318	100	30	160	43	2.0	1	180.32	16.4	100	3.1 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_e = 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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2101.3'-2101.7'
 LABORATORY IDENTIFICATION NO.: 10023/2-3AV
 SAMPLE DESCRIPTION: Limestone: pale yellow, slightly friable grainstone

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: 94 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 7, 12

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.1/2.9* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm ³)	w _c (%)	Y _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)
7.33	9.93	567.08	21.2	102.3	0.395	88	30	160	34	5.6	1	929.22	21.2	88	6.2 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_c = Moisture content (ASTM D 2216); Y_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; k₂₀ = Saturated hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: PM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2101.3'-2101.7'
 LABORATORY IDENTIFICATION NO.: 10023/2-3AH
 SAMPLE DESCRIPTION: Limestone: pale yellow, slightly friable grainstone

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): 9, 18, 25

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.1/2.9* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.73	4.79	121.14	21.0	106.6	0.369	97	30	160	29	4.9	1	206.99	21.2	98	2.4 x 10⁻⁴

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B; Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/06/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2102.5'-2102.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-3BV
 SAMPLE DESCRIPTION: Limestone: pale yellow, slightly friable grainstone

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: 93 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 4, 11, 17

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.0/3.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
7.91	10.02	623.73	21.8	105.4	0.377	98	30	160	20	11.7	1	1053.4	21.8	98	2.0 x 10⁻⁴

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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2102.5'-2102.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-3BH
 SAMPLE DESCRIPTION: Limestone: pale yellow, slightly friable grainstone

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: 97 % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 9

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.0/3.2* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.79	4.79	122.11	21.8	106.0	0.373	99	30	160	28	3.5	3	207.35	21.8	99	2.4 x 10⁻⁴

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2105.9'-2106.4'
 LABORATORY IDENTIFICATION NO.: 10023/2-3CV
 SAMPLE DESCRIPTION: Limestone: very pale brown, slightly friable
packstone

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: 91 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 7, 14, 20

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.9/4.1* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
10.28	9.36	708.13	23.4	103.3	0.392	99	30	160	24	1.2	1	1171.9	23.4	99	2.3 x 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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 05/24/10
 Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/26/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 3, 2105.9-2106.4'
 LABORATORY IDENTIFICATION NO.: 10023/2-3CH
 SAMPLE DESCRIPTION: Limestone: very pale brown, slightly friable
packstone

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) 10, 16, 23, 28

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.9/4.1* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.92	4.85	127.66	21.9	103.8	0.389	94	30	160	25	3.8	1	212.29	23.4	100	1.7 x 10⁻⁴

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 4, 2435.8'-2436.2'
 LABORATORY IDENTIFICATION NO.: 10023/2-4AV
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, very hard, finely crystalline

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: 72 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 11, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 5.4/4.5* Length Trimmed: ☒ Yes ☐ No
 TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
11.20	10.01	881.65	0.5	169.7	0.039	35	30	70	34	0.49	21	2397.8	0.5	38	2.0 x 10 ⁻¹⁰

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 .
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 03/04/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 4, 2435.8'-2436.2'
 LABORATORY IDENTIFICATION NO.: 10023/2-4AH
 SAMPLE DESCRIPTION: Dolostone: grayish-brown, very hard, finely crystalline

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: 84 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 8, 15, 24

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 5.4/4.5* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.83 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity
H (cm)	D (cm)	V (cm ³)	w _e (%)	γ_d (pcf)	n	S (%)	$\bar{\sigma}_c$ (psi)	u_b (psi)	i_{avg}	Q (cm ³)	t (days)	WDS (g)	w _e (%)	S (%)	k_{20} (cm/sec)
7.30	5.02	144.31	0.5	171.2	0.031	48	30	70	72	0.05	21	395.82	0.5	48	2.6 x 10 ⁻¹¹

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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Where: H = Specimen height; D = Specimen diameter; V = Volume; WDS = Dry mass; w_e = 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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 4, 2438.9'-2439.3'
 LABORATORY IDENTIFICATION NO.: 10023/2-4BV
 SAMPLE DESCRIPTION: Dolostone: brown, very hard, finely crystalline

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: 86 (stable) % ☐ Beginning of Test;
☒ End of Test

$\Delta\sigma_c$ (psi): 6, 11

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.4/2.0* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.84 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
4.90	10.02	385.65	0.6	169.1	0.046	34	30	70	126	0.24	37	1044.9	0.6	34	1.3 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 5, 2781.5'-2781.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-5AV
 SAMPLE DESCRIPTION: Limestone: yellowish-gray, moderately hard
grainstone

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: 92 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi): 11, 16, 22

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 5.6/3.5* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
8.72	9.95	678.26	17.9	114.2	0.327	100	30	160	23	2.8	1	1241.1	17.9	100	2.6 x 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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: 
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 5, 2781.5'-2781.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-5AH
 SAMPLE DESCRIPTION: Limestone: yellowish-gray, moderately hard
grainstone

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): 24, 31, 40

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 5.6/3.5* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.72 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.93	4.93	132.42	16.8	114.2	0.327	94	30	160	28	1.0	1	242.26	17.9	100	5.7 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/08/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 5, 2782.5'-2782.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-5BV
 SAMPLE DESCRIPTION: Limestone: yellowish-gray, moderately hard
grainstone

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): 12, 16

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☐ Yes ☒ No
 As-Received Length (inch): 4.6/3.4* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☒ Vertical ☐ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
8.62	9.98	674.16	14.6	116.5	0.311	87	30	160	26	0.91	1	1258.5	14.6	87	1.4 x 10 ⁻⁶

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.
 * First length is total sample length. Second length is useable length at full core diameter.

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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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM Date: 05/24/10
 Form SR-2B: Rev. 0

ARDAMAN & ASSOCIATES, INC. GEOTECHNICAL TESTING LABORATORY

ROCK CORE HYDRAULIC CONDUCTIVITY TEST REPORT

CLIENT: Youngquist Brothers, Inc.
 PROJECT: City of Hialeah RO Injection Wells
 FILE NO.: 10-023
 DATE SAMPLE RECEIVED: 02/05/10 SET UP: 02/25/10
 DATE REPORTED: 05/24/10

INCOMING LABORATORY SAMPLE NO.: IW-2, Core 5, 2782.9'-2782.9'
 LABORATORY IDENTIFICATION NO.: 10023/2-5BH
 SAMPLE DESCRIPTION: Limestone; yellowish-gray, moderately hard
grainstone

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: 77 (stable) % ☐ Beginning of Test;
☒ End of Test
 $\Delta\sigma_c$ (psi) 16, 22, 30

SPECIMEN DATA:

As-Received Diameter (inch): 4 Diameter Trimmed: ☒ Yes ☐ No
 As-Received Length (inch): 4.6/3.4* Length Trimmed: ☒ Yes ☐ No

TEST SPECIMEN ORIENTATION: ☐ Vertical ☒ Horizontal

SPECIFIC GRAVITY, G_s : 2.71 ☐ Assumed
☒ Measured (ASTM D 854)

PERMEANT: ☒ Deaired Tap Water ☐ Other _____

Initial Conditions							Test Conditions					Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
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 (%)	
6.66	4.47	104.55	14.6	120.3	0.289	97	30	160	39	1.4	1	201.57	14.6	97	9.6 x 10 ⁻⁵

COMMENTS: (1) Horizontal permeability test specimen was cross-cored from the corresponding vertical test specimen.
 * First length is total sample length. Second length is useable length at full core diameter.

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 hydraulic conductivity at 20°C; n = Total porosity; and G_s = Specific gravity.

Checked By: TM
 Form SR-2B: Rev. 0

Date: 05/24/10

IW-1

CORE SAMPLE INVENTORY

WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 OF 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBERS: 1 - 5
DEPTH INTERVAL: 2206 to 2831 ft	PERCENT RECOVERY: var.	CORE DIAMETER: 4
SAMPLE DESCRIPTION BY: DL, RS, BM	DATE: 01/31/10	

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
Core No 1 (2206 - 2211 ft)	
2206.5 - 2207.1	LIMESTONE: light gray moderately hard grainstone.
2708.6 - 2209.2	LIMESTONE: grayish brown moderately hard grainstone.
Core No 2 (2303 - 2313 ft)	
2304.5 - 2304.9	DOLOSTONE: grayish brown, hard, dense.
2306.8 - 2307.4	DOLOSTONE: grayish brown, hard, dense.
2311.8 - 2312.4	DOLOSTONE: brown, hard, dense.
Core No 3 (2505 - 2513 ft)	
2507.1 - 2507.5	DOLOSTONE: very dark gray, hard, dense.
2508.6 - 2509.0	DOLOSTONE: very dark gray, hard, dense.
2510.8 - 2511.5	DOLOSTONE: very pale brown, hard, dense.
Core No 4 (2730 - 2746.5 ft)	
2733.9 - 2734.3	LIMESTONE: very pale brown, moderately hard grainstone.
2739.0 - 2739.4	LIMESTONE: very pale brown, moderately hard grainstone.
2743.3 - 2743.7	LIMESTONE: very pale brown, moderately hard packstone.
Core No 5 (2816 - 2831 ft)	
2819.4 - 2819.9	LIMESTONE: very pale brown, moderately hard grainstone.
2827.6 - 2828.1	LIMESTONE: gray, moderately hard packstone.
2829.8 - 2830.2	LIMESTONE: gray, moderately hard, packstone to wackestone.
Sample Lab Analyses:	Vertical and horizontal permeability, porosity, specific gravity, elastic modulus, and compressive strength.

CORE SAMPLE DESCRIPTION		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 1
CORED INTERVAL: 2206 - 1118 ft	RECOVERED: 2206 - 2211	PERCENT RECOVERED: 40%
DESCRIPTION: D. Legett	CORE DIAMETER: 4-inches	DATE: 01/03/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 2
CORED INTERVAL: 2303 - 2313 ft	RECOVERED: 2203 - 2313 ft	PERCENT RECOVERED: 100%
DESCRIPTION: D. Legett & R. Maliva	CORE DIAMETER: 4-inches	DATE: 01/05/10

[illegible]

CORE SAMPLE DESCRIPTION

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CORE NUMBER: 2

CORED INTERVAL: 2303 - 2313 ft

RECOVERED: 2203 - 2313 ft

PERCENT RECOVERED: 100%

DESCRIPTION: D. Legett & R. Maliva

CORE DIAMETER: 4-inches

DATE: 01/05/10

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION

CORE SAMPLE DESCRIPTION		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 3
CORED INTERVAL: 2505 – 2513 ft	RECOVERED: 7.4 feet	PERCENT RECOVERED: 93
DESCRIPTION: R. Stross & R. Maliva	CORE DIAMETER: 4-inches	DATE: 01/09/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 4
CORED INTERVAL: 2730 – 2746.5 ft	RECOVERED: 16.5 feet	PERCENT RECOVERED: 100
DESCRIPTION: R. Maliva	CORE DIAMETER: 4-inches	DATE: 01/12/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-1	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 5
CORED INTERVAL: 2816 – 2831 ft	RECOVERED: 13.3 feet	PERCENT RECOVERED: 89
DESCRIPTION: R. Stross	CORE DIAMETER: 4-inches	DATE: 01/14/10

[illegible]

IW-2

CORE SAMPLE INVENTORY

WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 OF 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBERS: 1 - 5
DEPTH INTERVAL: 1953 - 2785 ft	PERCENT RECOVERY: var.	CORE DIAMETER: 4
SAMPLE DESCRIPTIONS BY: DL, RS, DB	DATE: 02/01/10	

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION
Core No 1 (1953 - 1968 ft)	
1955.6 - 1956.2	LIMESTONE: very pale brown, moderately hard packstone.
1960.4 - 1961.1	LIMESTONE: very pale brown, moderately hard packstone.
1966.8 - 1967.2	LIMESTONE: very pale brown, moderately hard packstone.
Core No 2 (2050 - 2065 ft)	
2053.7 - 2354.5	LIMESTONE: light brownish gray, moderately hard grainstone.
2058.9 - 2059.5	LIMESTONE: light grayish brown, slightly friable grainstone.
2062.6 - 2063.9	LIMESTONE: very pale brown, slightly friable grainstone.
Core No 3 (2100 - 2108.5 ft)	
2101.3 - 2101.7	LIMESTONE: pale yellow, slightly friable grainstone.
2102.5 - 2102.9	LIMESTONE: pale yellow, slightly friable grainstone.
2105.9 - 2106.4	LIMESTONE: very pale brown, slightly friable packstone.
Core No 4 (2432 - 2442 ft)	
2435.8 - 2436.2	DOLOSTONE: grayish brown, very hard, finely crystalline.
2438.9 - 2439.3	DOLOSTONE: brown, very hard, finely crystalline.
2440.9 - 2441.5	DOLOSTONE: brown, very hard, finely crystalline.
Core No 5 (2775 - 2785 ft)	
2781.5 - 2781.9	LIMESTONE: yellowish gray, moderately hard grainstone.
2782.5 - 2782.9	LIMESTONE: yellowish gray, moderately hard grainstone.
Sample Lab Analyses:	Vertical and horizontal permeability, porosity, specific gravity, elastic modulus, and
	compressive strength.

CORE SAMPLE DESCRIPTION		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER:
CORED INTERVAL: 1952 - 1968 ft bpl	RECOVERED: 14 ft 4 inches	PERCENT RECOVERED: 90%
DESCRIPTION: D.Barnes	CORE DIAMETER: 4-inches	DATE: 1/18/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 2
DEPTH INTERVAL: 2050 - 2065 ft	PERCENT RECOVERY: 92 %	CORE DIAMETER: 4-inches
SAMPLE DESCRIPTION BY: DL		DATE: 01/19/10

PAGE: 1 of 1

CORE NUMBER: 2

CORE DIAMETER: 4-inches

DATE: 01/19/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 2
DEPTH INTERVAL: 2100 - 2108.5 ft	PERCENT RECOVERY: 61 %	CORE DIAMETER: 4-inches
SAMPLE DESCRIPTION BY: DL		DATE: 01/20/10

PAGE: 1 of 1

CORE NUMBER: 2

CORE DIAMETER: 4-inches

DATE: 01/20/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 4
CORED INTERVAL: 2432 - 2442 ft	RECOVERED: 8 feet	PERCENT RECOVERED: 80
DESCRIPTION: R. Stross	CORE DIAMETER: 4-inches	DATE: 01/24/10

[illegible]

CORE SAMPLE DESCRIPTION		
WELL: IW-2	PROJECT NO.: 0044-0122	PAGE: 1 of 1
SITE LOCATION: Hialeah RO	PERMIT NO.: 0289249-001-UC	CORE NUMBER: 5
CORED INTERVAL: 2774.4 - 2785.6 ft	RECOVERED: 8.3 feet	PERCENT RECOVERED: 74
DESCRIPTION: R. Stross	CORE DIAMETER: 4-inches	DATE: 01/27/10

[illegible]

CORE SAMPLE DESCRIPTION

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

CORE NUMBER: 5

CORED INTERVAL: 2774.4 - 2785.6 ft

RECOVERED: 8.3 feet

PERCENT RECOVERED: 74

DESCRIPTION: R. Stross

CORE DIAMETER: 4-inches

DATE: 01/27/10

DEPTH INTERVAL (FEET)	SAMPLE DESCRIPTION

Appendix M

Geophysical Log Interpretations

Hialeah ROWTP IW-1

**Logs run on the nominal 60.5-inch diameter hole (Nov. 11, 2009)
0 to 160 ft bpl.**

Caliper and Gamma Ray Logs

Log is not diagnostic of lithology because of the hole diameter. Confirmed the hole was open (> 62-inches in diameter) to total depth.

**Logs run on the nominal 12.25-inch diameter pilot hole (Nov. 15, 2009)
180 to 1,100 ft bpl.**

Caliper Log, Gamma Ray, and Dual Induction Logs

The caliper, gamma ray, and dual induction logs of the pilot hole through the Hawthorn Group is used primarily to determine lithology. Clay-rich areas tend to have high gamma ray activities and low resistivities. Phosphatic intervals have very high gamma ray activities (> 100 GAPI).

<u>Depth (ft bpl)</u>	<u>Description</u>
180 - 432	Clay-rich strata. Gamma ray activity > 30 GAPI.
432 - 630	Transition to less clayey limestone, sharp down-hole drop in gamma ray activity and increase in resistivity
630 - 720	Generally clay rich interval. Interbedded clays and limestone. Clay beds have characteristics high gamma ray activity and low resistivity.
720 - 770	Limestone interval
770 - 820	Clayey strata
820 - 880	Mostly limestone
880 - 1,050	Clay-rich interval
1,050 - 1,090	Sharp increase in resistivity suggesting transition to clean limestone.

**Logs run on the nominal 50.5-inch diameter hole (Nov. 28, 2009)
155 to 1,079 ft bpl.**

Caliper and Gamma Ray Logs

Low intensity gamma ray response due to large borehole diameter. Good match between wells IW-1 and IW-2. Borehole remains open and was suitable for the installation and cementing of the 42-inch diameter casing.

**Cement Top Temperature Logs Run on the 42-inch diameter casing of IW-2
(Nov. 28, 2009)
0 to 1,071 ft bpl**

Cement stage 1 log – very uniform response (85 to 95°F between 10 and 1,030 ft bpl, with no suggestion of any anomalies.

Cement stage 2 log – very uniform response (90 to 95°F between 30 and 440 ft bpl, with no suggestion of any anomalies.

**Logs run on the nominal 12.25-inch diameter pilot hole (Dec. 6, 2009)
1,060 to 2,156 ft bpl.**

Caliper Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,110 – 1,450	Borehole diameter, ranges mostly from 13.5 to 16.5 inches with an overall trend of decreasing diameter with depth.
1,450 – 2,130	Nominal borehole enlargement and variation in borehole diameter; ranges predominantly from 12.7 to 14.0 inches for 12.25-inch diameter bit. No suggestion of fracturing; typical pattern for competent limestone.

Gamma Ray Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 – 1,146	High gamma ray activity (10 to 85 GAPI).
1,146 – 1,490	Sharp drop in gamma ray activity at 1,146 ft bpl marks the downhole transition to the relatively pure limestones of the Avon Park Formation. Low gamma ray activities (≤ 20 GAPI)

1,490 - 1,750	Interval of somewhat high and more variable gamma ray activity (10 to 25 GAPI) with peaks at 1,602 and 1,742 ft bpl.
1,750 - 2,145	Low gamma ray activities (nearly all ≤ 20 GAPI)

Borehole Compensated Sonic

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 - 1,145	Variable sonic transit times reflecting heterogeneities in lithology and porosity in the Suwannee Limestone.
1,145 - 1,580	Gradual decrease in sonic travel times from mostly 120 to 130 $\mu\text{sec}/\text{ft}$ to 100 to 115 $\mu\text{sec}/\text{ft}$, which records a decrease in porosity with depth in the limestones.
1,580 - 1,670	Relatively constant travel times mostly in the 105 to 115 $\mu\text{sec}/\text{ft}$ range.
1,670 - 1,750	More variable interval with five low sonic transit time peaks 67 to 95 $\mu\text{sec}/\text{ft}$. Better cemented beds or dolomitic beds.
1,750 - 2,140	Relatively constant travel times mostly in the 95 to 115 $\mu\text{sec}/\text{ft}$ range. Porous rock.

Dual Induction Log and Log-derived TDS

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 - 1,145	Variable resistivity reflecting differences in lithology and porosity of the Suwannee Limestone strata.
1,145 - 1,650	Minimal separation of deep, medium, and shallow logs. Relatively constant resistivity of 10 ohm-m. TDS between 1,300 and 1,650 ft bpl range between 4,000 to 5,000 mg/L.
1,650 - 1,830	More variable resistivity reflecting lithologic variation. The lithologic variation has caused variation in the log-derived TDS which does not reflect changes in actual pore water composition.
1,830 - 1,970	Sharply decrease deep resistivity from 10 ohm-m to 2.1 ohm-m reflecting an increase in pore water salinity and the sonic transit times (porosity) changed little in this depth interval. Also progressively increasing separation of the logs, with the greater resistivity of the shallow log reflecting invasion of less saline water from the closed

circulation system. Log-derived TDS increased from approximately 5,000 mg/L to 27,000 mg/L over this interval. The based of the USDW (10,000 mg/L) occurs at 1,870 – 1,875 ft bpl

1,970 – 2,140	Some variation in the deep resistivity 1.7 to 2.7 ohm-m but not overall trend. Considerable separation of the three resistivity logs with the shallow resistivity in the 4.5 to 6.5 ohm-m range. Log-derived salinity is mostly 25,000 to 30,000 mg/L range, which is close to seawater.
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Flowmeter Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,090 – 1,320	Little net flow contribution. Variation is flow meter readings is largely a response to changes in borehole diameter.
1,320 – 1,565	Minor flow through depth interval
1,565 – 1,675	Increased by still minor, gradual
1,675 – 1,685	Major flow zone, top of the Avon Park Permeable zone.
1,685 – 2,120	No significant flow.

Fluid Conductivity and Temperature Logs

<u>Depth (ft bpl)</u>	<u>Description</u>
1,065 – 1,695	Near constant dynamic temperature of 75.6 ± 0.3 °F Dynamic conductivity increases with depth from about 8,000 μ S to 10,000 μ S.
1,695 – 1,708	Abrupt increase in dynamic T from 76.0 to 78.8 °F, which suggests flow zone. Dynamic conductivity increases from approximately 9,900 to 10,500 μ S.
1,708 – 1,780	Steady increase in dynamic T to 77.1 °F. Steady increase in dynamic conductivity to 12,100 μ S.
1,780 – 2,120	Dynamic T continuously decreases to 73.9 °F. Modest overall trend (with fluctuations) of decreasing dynamic conductivity with increasing depth reaching 10,587 μ S at 2,120 ft bpl.
2,120 – 2,159	Sharp decrease in conductivity to 5,747 μ S.

**Cement Top Temperature Logs Run on the 34-inch Casing of IW-1
(Dec. 28 to 31, 2009)
1,900 ft bpl to land surface**

The cement top temperature logs record the increase in temperature from the heat of hydration of curing cement. The depth intervals of the casing that contain recently emplaced cement (with 24 hours) should have uniformly elevated temperatures except towards top where temperatures should gradually decrease to background levels. Gaps in the cement would be manifested by relatively cool zones. The cement top is usually located about 50 ft below the depth at which temperature returns to close to the background value (geothermal gradient)

- Stage 1 log: Uniform temperature of about 107 °F to 1,725 ft bpl, temperature decreases to 73°F at 1540 ft. Tagged depth was 1,580 ft bpl.
- Stage 2 log: Uniform temperature of about 102 °F from 1,590 to 1,500 ft bpl, temperature approaches background (at 75°F) at 1,360 ft bpl. Tagged depth was 1,402 ft bpl.
- Stage 3 log: Uniform temperature of about 100 to 104 °F to 1,320 ft bpl, temperature decreases to 77°F at 1,150 ft bpl. Tagged depth was 1,206 ft bpl.
- Stage 4 log: Uniform temperature of about 100 to 105 °F from 1,230 to 1,140 ft bpl, gradually decreases to 77°F at 950 ft bpl. Tagged depth was 1,018 ft bpl.
- Stage 5 log: Uniform temperature of about 90 to 98 °F from 700 to 1,025 ft bpl, gradually decreases to 80°F at 450 ft bpl. Tagged depth was 525 ft bpl.

The cement top temperature logs reveal not anomalies and are consistent with proper cementation of the 34-inch diameter casing.

**Logs run on the nominal 12.25-inch diameter pilot hole (Jan. 24, 2010)
1,900 to 3,500 ft bpl.**

Caliper Log

The caliper log can provide qualitative information on the hardness of the penetrated strata. Softer rock tends to be 'eroded' to greater degree during drilling and as a result have greater borehole diameters. Hard, competent, fractured rock tends to have borehole diameters close to bit size.

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 2,300	Moderate borehole enlargement and some asymmetry. Diameter ranges up to 16.5 inches for a 12.25-inch diameter bit.
2,300 - 2,320	Borehole close to bit size. Harder rock (dolostone).
2,320 - 2,435	Softer rock with moderate enlargement (similar to 1,910 to 2,300 ft bpl).
2,435 - 2,580	Very hard rock (predominantly) dolostone. Borehole diameter is close to bit size (mostly \leq 13-inches)
2,580 - 2,610	Fractured rock, borehole enlargement ($>$ 30-inches).
2,610 - 2,834	Hard rock, minor borehole enlargement. Borehole diameters are mostly between 12.7 and 13.9 inches.
2,834 - 2,840	Fracture zone. Borehole diameter is greater than 30 inches.
2,840 - 3,029	Interval of relatively soft limestone. 'Bulge' in borehole diameter increasing to about 20-inches at 2,925 ft bpl.
3,029 - 3,500	Hard rock with borehole diameter close to bit size. Fractures are 3,149, 3,207, 3,337, 3,379, and 3,368 ft bpl.

Gamma Ray Log

The natural gamma ray log shows an inverse relationship to borehole diameter. Measured gamma ray activities are less in larger diameter boreholes.

<u>Depth (ft bpl)</u>	<u>Description</u>
1,900 - 2,300	Low gamma ray activity (predominantly \leq 15 GAPI).

2,300 - 2,320	Increased activity corresponding to smaller borehole diameter at dolomitic interval.
2,320 - 2,400	Low gamma ray activity (predominantly ≤ 15 GAPI).
2,400 - 2,600	Increased gamma ray activity (5 to 40 GAPI) due to reduced borehole diameter.
2,600 - 2,800	Uniformly low gamma ray activity (≤ 10 GAPI).
2,800 - 2,840	Zone of increased gamma ray activity without a corresponding change in borehole diameter (i.e., composition signal).
2,840 - 3,050	Uniformly very low (≤ 6 GAPI), largely reflecting the enlarge borehole.
3,050 - 3,105	Variable gamma ray activity (≤ 22 GAPI)
3,105 - 3,445	Pronounced overall increase in gamma ray activities to values mostly in the 20 to 40 GAPA range. Increase at 3,105 ft bpl does not have a corresponding change in borehole diameter

Borehole Compensated Sonic

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 2,300	Relatively constant sonic transit times in 95 to 105 $\mu\text{sec}/\text{ft}$ range, which corresponds to porosities of 35% to 45%.
2,300 - 2,320	Hard, low porosity dolomite, transit times in the 45 to 40 $\mu\text{sec}/\text{ft}$.
2,320 - 2,430	Mostly porous limestone with transit times in the 90 to 95 $\mu\text{sec}/\text{ft}$.
2,430 - 2,472	Mainly dolostone, variable sonic transit times (45 to 90 $\mu\text{sec}/\text{ft}$).
2,472 - 2,497	Fractured dolostone. Two zone with high transit times (> 110 $\mu\text{sec}/\text{ft}$); 2,472-2,485 and 2,492-2,497 ft bpl)
2,497 - 2,536	Mostly dolostone, unfractured. Transit times in the 55 to 85 $\mu\text{sec}/\text{ft}$ range.
2,536 - 2,576	Dolostone and subsidiary limestone with fractured intervals. Highly variable transit times (55 to 150 $\mu\text{sec}/\text{ft}$)
2,576 - 2,612	Major fracture zone from 2,576 to 2,612 ft bpl with sonic transit times mostly in the 140 to 240 $\mu\text{sec}/\text{ft}$ range.

2,612 – 2,760	Mostly unfractured limestone and dolomitic limestone with uniform sonic transit times of 80 to 90 $\mu\text{sec}/\text{ft}$ and sonic porosities of about 25%.
2,760 – 2,834	Unfractured limestone and dolostone. Transit times mostly in 75 to 100 $\mu\text{sec}/\text{ft}$ range.
2,834 – 2,842	Fracture dolostone. Transit time of 195 $\mu\text{sec}/\text{ft}$ range
2,842 – 3,028	Unfractured porous limestone, transit times mostly in the 95 to 100 $\mu\text{sec}/\text{ft}$ range
3,028 – 3,145	Interbedded tight dolostone (transit times $\leq 60 \mu\text{sec}/\text{ft}$) and porous limestone, similar to above. Only minor fracturing suggested by log.
3,145 – 3,160	Fracture zone – transit times $> 210 \mu\text{sec}/\text{ft}$.
3,160 – 3,204	Predominantly tight unfractured dolostone (transit times 50 to 55 $\mu\text{sec}/\text{ft}$).
3,204 – 3,210	Fractured dolostone – transit times peak at 145 $\mu\text{sec}/\text{ft}$.
3,210 – 3,335	Unfractured dolostone with transit times in the 50 to 80 $\mu\text{sec}/\text{ft}$ range.
3,335 – 3,338	Fractured zone - transit times peak at 140 $\mu\text{sec}/\text{ft}$.
3,338 – 3,360	Unfractured tight dolostone –transit times of 50 to 70 $\mu\text{sec}/\text{ft}$.
3,360 – 3,380	Fractured zone – transit times most in 150 to 225 $\mu\text{sec}/\text{ft}$ range.
3,380 – 3,400	Tight dolostone – transit times about 50 $\mu\text{sec}/\text{ft}$.
3,400 – 3,452	Porous dolomitic limestone and calcareous dolostone. Transit times in 100 to 138 $\mu\text{sec}/\text{ft}$ range.
3,453 – 3,457	Tight dolostone – transit times about 52 $\mu\text{sec}/\text{ft}$.
3,457 – 3,465	Fractured dolostone - transit times peak at 180 $\mu\text{sec}/\text{ft}$.
3,465 – 3,462	Interbedded dolostone and limestone, transit times between 50 and 90 $\mu\text{sec}/\text{ft}$.

Dual Induction Log

The entire interval from 1,900 to 3,500 ft bpl contains water with salinity close to that of seawater. The measured resistivities thus reflect porosity and rock types. Porous (30 to 45%) limestones have resistivities in the 2 to 3 ohm-m range, and typically only minor separation of the shallow, medium, and deep resistivity tracks. Tight dolostones have resistivities greater than 10 ohm-m and often shallow resistivities of 100 ohm-m or greater.

Fractured zones are evident on the dual induction log and dolomitic beds with relatively low resistivities, similar to those of porous limestones. The shallow resistivity of fractured dolostones is less than 10 ohm-m, whereas nearby unfractured dolostones have resistivities of greater than 10 ohm-m. Fractured zones can usually be differentiated from unfractured porous rock by a greater separation of the shallow, medium, and deep resistivities, with medium and deep resistivities being in the 1 to 2 ohm-m range or lower.

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 2,298	Very uniform response (2 to 3 ohm-m) with minimal separate of tracks. Porous limestone
2,298 - 2,322	Increased resistivity (10 to 32 ohm-m) reflecting tight dolostone lithology
2,322 - 2,430	Resistivities in 2.5 to 3.5 ohm-m range with minimal separation. Less porous limestones than from 1,910 to 2,298 ft bpl.
2,430 - 2,580	Variable resistivities, mostly greater than 10 ohm-m.
2,580 - 2,612	Dolostone with low resistivities and separation of tracks. Fractured rock. Shallow and medium resistivities less than 2 ohm-m.
2,612 - 2,836	Generally little variation in resistivity and minimal separation of tracks. Resistivities are mostly in the 3.5 to 5.0 ohm-range.
2,836 -2,842	Fractured interval manifest by decrease in deep and medium resistivity to below 2 ohm-m.
2,842 - 3,028	Porous limestone (or dolomitic limestone). Resistivities in the 2 to 3 ohm-m range and only minor separation of the tracks.
3,028 - 3,500	Variable lithologies as manifested by highly variable resistivities. Fractured zones, as indicated by deep and medium resistivities of less

than 2 ohm-m occur at 3,147 – 3,156, 3,336 – 3,342, and 3,362 – 3,372 ft bpl.

Flowmeter Log

Static and dynamic flowmeter logs were run on the 12.25- inch diameter pilot hole from 1,880 to 3,500 ft bpl. The dynamic flowmeter log was performed at a pumping rate of 350 gpm. Flowmeter logs can provide information on the location of high-transmissivity zones. However, much of the tested strata produced no detectable water. The flowmeter log is therefore not useful for evaluating the relative degree of confinement provided by low productivity strata.

The bulk of the water produced during the flowmeter log entered the well between approximately 2,460 and 2,500 ft bpl, with a lesser amount between 2,500 and 2,520 ft bpl. The 2,460 to 2,520 ft bpl interval includes the uppermost fractured zone. The lower flow zones were not stressed during the flowmeter test.

Borehole Televiewer

The borehole televiewer is an acoustic imaging log that provides a detail, wrap-around image of the borehole wall. Borehole televiewer logs are of great value in that they allow for observation of sedimentary structures and potential flow features such as fractures, vugs, and cavities. The log also provides information on sonic transit times and amplitudes which are expressed on the logs as shades of yellow, orange and brown (darker colors correspond to longer transit times and greater porosities).

<u>Depth (ft bpl)</u>	<u>Description</u>
1,895 – 2,301	Horizontally bedded unfractured limestone. No significant vertical flow features are evident. Thin porous horizons are present (vuggy or burrow zones; e.g., 2,093, 2,109, 2,134, 2,147, 2,184, and 2,277 ft bpl), which may be zones of enhanced horizontal flow.
2,301	Sharp transition from porous limestone to dense dolostone.
2,301 – 2,307	Some fracturing of dolostone.
2,307 – 2,313	Dense dolostone, some vugs, not fractured.
2,313 – 2,318	Dolostone with fractures.
2,318 – 2,439.5	Interbedded (horizontally) limestone and dolostone. No suggestion of fracturing. Appears to provide very effective vertical confinement.
2,439.5 – 2,472	Vuggy dolostone, not significantly fractured.

2,472 - 2,509	Vuggy dolostone. Larger vugs and some fractures. Not completely brecciated.
2,509 - 2,537	Vuggy dolostone separated by intact beds. May have a high horizontal hydraulic conductivity and very low vertical hydraulic conductivity.
2,537 - 2,550	Cavities and some fracturing. Large cavity from 2,543 to 2,545 ft bpl.
2,550 - 2,578	Vuggy dolomite with some horizontal cavities
2,578 - 2,579.8	Fracture dolostone.
2,579.8 - 2,613	Vuggy dolostone with large cavities (2,583.7 - 2,585.7, 2,588.5 - 2,590, 2,598 - 2,602 ft bpl). Fracturing is also evident. Log suggests that fracturing occur preferentially at existing cavities and vug instead of cavities being solely the product of fracturing.
2,613 - 2,730	Horizontally bedded unfractured limestone and dolostones. Some vugs.
2,730 - 2,838	Similar to above. Some apparent fracturing between 2,755 and 2,779 ft bpl.
2,838 - 2,841.5	Cavity
2,841.5 - 2,940	Horizontally bedded limestone. Some more porous horizons but not vertical flow features.

Borehole Video Survey

The borehole video survey allows for viewing of the borehole wall and the observation of potential flow features such as fractures.

<u>Depth (ft bpl)</u>	<u>Description</u>
2,100 - 2,140	Porous appear rock in which bedding is evident. Relatively smooth borehole wall. No fractures are evident. Vuggy horizons are evident.
2,140 - 2,180	Same as above.
2,180 - 2,220	Same as above.
2,220 - 2,260	Same as above.
2,260 - 2,280	Same as above. Large vugs/small cavities at 2,284 ft bpl.
2,280 - 2,297	Same as above

2,297 - 2,302	Dolostone with open fractures. Fractures clearly visible with side view camera.
2,302 - 2,312	Fractures are less common. Scattered and not vertically continuous.
2,312 - 2,435	Unfractured bedded rock with vuggy horizons
2,435 - 2,505	Mostly dolostone with fractured intervals with associated borehole enlargement. Fracturing well developed from 2,478 to 2,485 ft bpl. Dolostone with fractures is separated by unfractured rock.
2,505 - 2,536	Most unfractured rock
2,536 - 2,545	Fractures and associated cavernous intervals. High sonic transit time interval

Break in log due to turbidity.

2,916.5 - 3,080	Limestone or dolomitic limestone, moderately smooth borehole wall, horizontal bedding. Dolomitic beds have rougher borehole walls and smaller diameters. Mostly unfractured.
3,080 - 3,143	Vuggy dolostone with fractured zones and associated borehole enlargement,
3,143 - 3,154	Fractured, cavernous dolostone
3,154 - 3,201	Vuggy dolostone with hairline fractures. Cavities associated with fractures (spalling). Formation is not pervasively fractured.
3,201 - 3,205	Cavernous zone, fractured.
3,205 - 3,220	Vuggy dolostone with hairline fractures. Spalling along fractures produce small cavities.
3,220 - 3,331	Similar to above except fracturing is less well developed.
3,331 - 3,356	Vuggy dolostone with some cavities (e.g., 3,332, 3,337, 3,340 ft bpl). Most of interval is not visible fractured.
3,356 - 3,375	Interbedded cavernous zone and unfractured rock.
3,375 - 3,397	Unfractured vuggy dolostone.

- | | |
|-----------------|--|
| 3,397 – 3,455 | Mostly unfractured dolostone. Vugs/cavities increase in size up section. Cavities may be from spalling rather than being dissolution features. |
| 3,455 – 3,463 | Large cavities (borehole enlargement). |
| 3,463 – 3,501.6 | Vuggy dolostone, some fractures and cavities. |

**Cement Top Temperature Logs Run on the 24-inch Casing of IW-1
(March 10 to 17, 2010)
2,975 ft bpl to land surface**

The depth intervals of the casing that contain recently emplaced cement (with 24 hours) should have uniformly elevated temperatures except towards top where temperatures should gradually decrease to background levels. Gaps in the cement would be manifested by relatively cool zones. The cement top is usually located about 50 ft below the depth at which temperature returns to close to the background value (geothermal gradient). If curing proceeds too rapidly, the temperature will “flash” resulting in a spike in the temperature log.

The maximum temperatures recorded for the temperature logs were between 100 and 125 °F. No temperature spikes or cool spots are evident in the cement top temperature logs. The temperature tops estimated from the temperature logs and tagged depths are listed below

- | | |
|--------------|--|
| Stage 1 log: | Break in slope 2,830 ft bpl, (T = °58F), estimated top: 2,880 ft bpl, tagged 2,878 ft bpl. |
| Stage 2 log: | Break in slope 2,710 ft bpl (T = °58F), estimated top 2,760 ft bpl, tagged 2,778 ft bpl. |
| Stage 3 log: | Break in slope 2,610 ft bpl (T = °58F), estimated top 2,660 ft bpl, tagged 2,650 ft bpl. |
| Stage 4 log: | Break in slope 2,470 ft bpl (T = °60F), estimated top 2,520 ft bpl, tagged 2,517 ft bpl. |
| Stage 5 log: | Break in slope 2,400 ft bpl (T = °60F), estimated top 2,450 ft bpl, tagged 2,461 ft bpl. |

No logs were run for short stages 6 through 9.

- | | |
|---------------|--|
| Stage 10 log: | Break in slope 1,985 ft bpl (T = °67F), estimated top 2,035 ft bpl, tagged 2,030 ft bpl. |
|---------------|--|

Stage 11 log: Break in slope 1,770 ft bpl ($T = ^\circ 67F$), estimated top 1,830 ft bpl, tagged 1,835 ft bpl.

Stage 12 log: Break in slope 1,320 ft bpl ($T = ^\circ 67F$), estimated top 1,370 ft bpl, tagged 1,370 ft bpl.

Stage 13 log: Break in slope 820 ft bpl ($T = ^\circ 73$), estimated top 870 ft bpl, tagged 877 ft bpl.

Stage 14 log: Break in slope 270 ft bpl ($T = ^\circ 67F$), estimated top 320 ft bpl tagged 326 ft bpl.

Geophysical Log Interpretations

Hialeah ROWTP IW-2

**Logs run on the nominal 60.5-inch diameter hole (Nov. 20, 2009)
0 to 158 ft bpl.**

Caliper and Gamma Ray Logs

Log is not diagnostic of lithology because of the hole diameter. Confirmed the hole was open (> 62-inches in diameter) to total depth.

**Cement Top Temperature Logs Run on the 52-inch diameter casing of IW-2
(Nov 20, 2009)
0 to 158 ft bpl**

Temperature varies between 95 and 123 °F between 10 and 154 ft bpl with the greatest temperatures in the middle interval 80 to 110 ft bpl. Log response of typical of well-cemented casing and there is no suggestion of any gaps in the cement.

**Logs run on the nominal 50.5-inch diameter hole (Dec 12, 2009)
50 to 1,070 ft bpl.**

Caliper and Gamma Ray Logs

Low intensity gamma ray response due to large borehole diameter. Good match between wells IW-1 and IW-2. Gamma ray peak markers are about 2 ft shallower in well IW-2 (826 and 1,046 ft bpl). Borehole remains open and was suitable for the installation and cementing of the 42-inch diameter casing.

**Cement Top Temperature Logs Run on the 42-inch diameter casing of IW-2
(Dec 13, 2009)
0 to 1,070 ft bpl**

Cement stage 1 log – very uniform response (89 to 92°F between 60 and 1,068 ft bpl, with no suggestion of any anomalies.

**Logs run on the nominal 12.25-inch diameter pilot hole (Dec. 19, 2009)
1,050 to 1,905 ft bpl.**

Comparison of gamma ray, sonic, and dual inductions logs of wells IW-1 and IW-2 indicate that the geology is consistent (with ± 2 ft) between the wells.

Caliper Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,090 - 1,360	Borehole diameter, ranges mostly from 12.5 to 15.0 inches.
1,360 - 1,550	Somewhat large borehole diameter (14 to 16 inches) with greatest diameters at about 1,410 to 1,520 ft bpl.
1,550 - 1,840	Borehole diameter mostly between 13.0 and 15.5 inches.
1,840 - 1,930	Borehole diameter decreases with depth to 12.5 inches at 1,930 ft bpl.

Gamma Ray Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,090 - 1,144	High gamma ray activity (10 to 67 GAPI).
1,144 - 1,494	Sharp drop in gamma ray activity at 1,144 ft bpl marks the downhole transition to the relatively pure limestones of the Avon Park Formation. Low gamma ray activities (≤ 20 GAPI)
1,494 - 1,700	Interval of somewhat high and more variable gamma ray activity (10 to 30 GAPI) with a sharp peak at 1,603 ft bpl.
1,700 - 1,940	Low gamma ray activities (nearly entirely ≤ 20 GAPI)

Borehole Compensated Sonic

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 - 1,145	Variable sonic transit times reflecting heterogeneities in lithology and porosity in the Suwannee Limestone.
1,145 - 1,230	Relatively high porosity interval; sonic transit times between 128 and 147 $\mu\text{sec}/\text{ft}$.

1,230 - 1,620	Gradual decrease in sonic travel times from mostly 120 to 135 to 100 to 125 $\mu\text{sec}/\text{ft}$, which records a decrease in porosity with depth in the limestones.
1,620 - 1,762	More variable interval with five low sonic transit time peaks 82 to 95 $\mu\text{sec}/\text{ft}$. Better cemented beds or dolomitic beds. The five peaks occur at about the same depths (1,697 to 1,747 ft bpl) as in well IW-2
1,762 - 1,918	Relatively constant travel times mostly in the 105 to 115 $\mu\text{sec}/\text{ft}$ range. Porous rock.

Dual Induction Log and Log-derived TDS

<u>Depth (ft bpl)</u>	<u>Description</u>
1,090 - 1,160	Variable resistivity reflecting differences in lithology and porosity of the Suwannee Limestone strata.
1,160 - 1,660	Deep resistivity is relatively constant between 8 and 10 ohm-m. TDS between 1,300 and 1,650 ft bpl is in the 4,000 to 7,000 mg/L range. Significant separation of tracks; shallow resistivity is mostly between 3 and 4 ohm-m.
1,660 - 1,810	More variable resistivity reflecting lithologic variation. The lithologic variation has caused variation in the log-derived TDS between 1,685 and 1,830 ft bpl which does not reflect changes in actual pore water composition.
1,810 - 1,920	Sharply decreases deep resistivity from 10 ohm-m to 2.9 ohm-m reflecting an increase in pore water salinity and the sonic transit times (porosity) changed little in this depth interval. Also progressively increasing separated of the logs, with the greater resistivity of the shallow log reflecting invasion of less saline water from the closed circulation system. Log-derived TDS increased from approximately 6,000 mg/L to 20,000 mg/L over this interval. The base of the USDW (10,000 mg/L) occurs at 1,870 - 1,880 ft bpl

Flowmeter Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,100 - 1,150	Minor flow zone - Upper Floridan Aquifer.

1,150 - 1,700	Little net flow contribution. Variation in flow meter readings is largely a response to changes in borehole diameter.
1,700 - 1,720	Major flow zone. Avon Park Permeable zone.
1,720 - 1,920	No significant flow.

Fluid Conductivity and Temperature Logs

<u>Depth (ft bpl)</u>	<u>Description</u>
1,045 - 1,084	Near constant conductivity and temperature readings. Dynamic T = 78.0 ± 0.4 °F, Cond. $18,700 \pm 300$ μ S.
1,084 - 1,150	Zone with lower dynamic temperatures and conductivity. Drops to T = 76.7 °F, Cond. 15,187 μ S.
1,150 - 1,700	Steady decrease in dynamic T from 78.2 to 77.1 °F. Steady increase in dynamic cond. From 19,275 to 28,171 μ S.
1,700 - 1,710	Abrupt increase in dynamic T to 77.9 °F. Suggests flow zone.
1,710 - 1,930	Dynamic T continuously decreases to 71.1 °F. Modest overall trend (with fluctuations) of decreasing dynamic conductivity; Readings mostly in the 23,500 to 27,000 μ S range.

**Cement Top Temperature Logs Run on the 34-inch Casing of IW-2
(Jan. 13 to 16, 2010)
1,892 ft bpl to land surface**

The cement top temperature logs record the increase in temperature from the heat of hydration of curing cement. The depth intervals of the casing that contain recently emplaced cement (with 24 hours) should have uniformly elevated temperatures except towards top where temperatures should gradually decrease to background levels. Gaps in the cement would be manifested by relatively cool zones. The cement top is usually located about 50 ft below the depth at which temperature returns to close to the background value (geothermal gradient)

Stage 1 log: Temperature varied between 95 and 110 °F to 1,792 ft bpl. Temperature steadily decreased to 75°F at 1,580 ft bpl and reached background temperature of 70°F at 1,500 ft bpl. Tagged depth was 1,644 ft bpl.

Stage 2 log: Temperature varied between 95 and 103 °F to 1,500 ft bpl. Temperature steadily decreased to 75°F at 1,400 ft bpl and approached background temperature of 72°F at about 1,300 ft bpl. Tagged depth was 1,428 ft bpl.

Stage 3 log: Temperature varied between 100 and 103 °F to 1,370 ft bpl. Temperature steadily decreased to 75°F at 1,205 ft bpl and approached background temperature of 72°F at about 1,100 ft bpl. Tagged depth was 1,269 ft bpl.

Stage 4 log: Temperature varied between 100 and 103 °F to 1,180 ft bpl. Temperature steadily decreased to 92°F at 1,090 ft bpl at which depth there was an abrupt drop in temperature to 83°F at 1,080 ft bpl. Decreased steadily with depth to 78°F at 850 ft bpl. Tagged depth was 1,084 ft bpl.

Stage 5 log: Overall gradual decrease in temperature with depth from 100 °F at 1,128 ft bpl to 90°F at 600 ft bpl. More rapid decrease in temperature to 75°F at 400 ft bpl.

Stage 6 log: Temperate between 90 and 97°F between 30 and 500 ft bpl.

Tagged depth was 525 ft bpl.

The cement top temperature logs reveal not anomalies and are consistent with proper cementation of the 34-inch diameter casing.

**Logs run on the nominal 12.25-inch diameter pilot hole (February 7, 2010)
1,900 to 3,500 ft bpl.**

Caliper Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 2,280	Moderate borehole enlargement and some asymmetry. Diameters range mostly between 14 and 17 inches for a 12.25-inch diameter bit.
2,280 - 2,315	Borehole close to bit size. (< 14 inches), harder rock, dolostone.
2,315 - 2,430	Softer rock with moderate enlargement (13.5 to 15.5 inches).
2,430 - 2,490	Very hard rock (predominantly) dolostone. Borehole diameter is close to bit size (mostly \leq 12.5 to 14-inches)
2,490 - 2,510	Fractured rock, borehole enlargement (> 30-inches).
2,510 - 2,590	Hard rock, dolomitic, diameters mostly between 12.5 and 14.5 inches.
2,590 - 2,830	Transition to softer limestone, diameters between 14 and 15 inches.
2,830 - 2,838	Fractured rock, borehole enlargement (> 30-inches).
2,838 - 3,020	Interval of relatively soft limestone. 'Bulge' in borehole diameter increasing to about 19-inches at 2,925 ft bpl. Diameters are mostly between 15 and 19 inches.
3,029 - 3,500	Hard rock with borehole diameter close to bit size. Fracture zones at: 3,046-3,500, 3,066-3,700, 3,140-3,145, 3,200-3,207, 3,246-3,253, and 3,468-3,472 ft bpl.

Gamma Ray Log

The natural gamma ray log shows an inverse relationship to borehole diameter. Measured gamma ray activities are less in larger diameter boreholes.

Gamma ray pattern in well IW-2 is very similar to that in well IW-1 with an approximately 4 ft shift (shallower in IW-2).

<u>Depth (ft bpl)</u>	<u>Description</u>
1,900 - 2,298	Low gamma ray activity (predominantly ≤ 15 GAPI).
2,298 - 2,318	Increased activity (20 to 30 GAPI) corresponding to smaller borehole diameter at dolomitic interval.
2,318 - 2,442	Variable activity inversely related to borehole diameter (mostly 5 to 20 GAPI).
2,442 - 2,462	Gamma ray activity peak, up to 40 GAPI
2,462 - 2,572	Variable activity, inversely related to borehole diameter.
2,572 - 2,583	Gamma ray peak, not related to borehole diameter.
2,583 - 2,778	Uniformly low gamma ray activity (≤ 12 GAPI).
2,778 - 2,840	Zone of increased gamma ray activity without a corresponding change in borehole diameter (i.e., composition signal).
2,840 - 3,045	Uniformly very low (≤ 6 GAPI), largely reflecting the enlarge borehole.
3,045 - 3,060	Variable gamma ray activity. Two peaks at 3,048 and 3,056 ft bpl, which occur at 3,052 and 3,060 ft bpl in well IW-1.
3,060 - 3,110	Very low gamma ray activity.
3,110 - 3,445	Pronounced overall increase in gamma ray activities to values mostly in the 10 to 50 GAPI range. Increase at 3,110 ft bpl does not have a corresponding change in borehole diameter. Peaks in activity at 3,314 and 3,391 ft bpl.

Borehole Compensated Sonic

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 2,294	Relatively constant sonic transit times in 95 to 105 $\mu\text{sec}/\text{ft}$ range, which corresponds to porosities of 35% to 45%.
2,294 - 2,316	Hard, low porosity dolomite, transit times in the 45 to 40 $\mu\text{sec}/\text{ft}$. Fracture zone from 2,298 - 2,306 ft bpl, long transit times.
2,316 - 2,432	Mostly porous limestone with transit times in the 90 to 95 $\mu\text{sec}/\text{ft}$.
2,432 - 2,440	Fracture zone.
2,440 - 2,490	Mainly dolostone. Variable sonic transit times (45 to 90 $\mu\text{sec}/\text{ft}$).
2,490 - 2,515	Fractured dolostone. Transit times > 240 $\mu\text{sec}/\text{ft}$
2,515 - 2,532	Mostly dolostone, unfractured. Transit times in the 55 to 85 $\mu\text{sec}/\text{ft}$ range.
2,532 - 2,594	Dolostone and subsidiary limestone with fractured intervals. Highly variable transit times (60 to 95 $\mu\text{sec}/\text{ft}$)
2,594 - 2,765	Mostly unfractured limestone and dolomitic limestone with uniform sonic transit times of 80 to 90 $\mu\text{sec}/\text{ft}$ and sonic porosities of about 25%.
2,765 - 2,832	Unfractured interbedded limestone and dolostone with sonic transit times mostly in the 75 to 100 $\mu\text{sec}/\text{ft}$ range; greater variation than above).
2,832 - 2,840	Fracture dolostone. Transit time of up to 175 $\mu\text{sec}/\text{ft}$.
2,840 - 2,918	Unfractured porous limestone. Transit times mostly in the 95 to 110 $\mu\text{sec}/\text{ft}$ range.
2,918 - 2,927	Fractured dolostone, transit time peak at 130 $\mu\text{sec}/\text{ft}$.
2,927 - 3,020	Unfractured porous limestone. Transit times mostly in the 95 to 105 $\mu\text{sec}/\text{ft}$ range.
3,020 - 3,400	Tight dolostone with fractured intervals. Tight dolostones have transit times of less than 60 $\mu\text{sec}/\text{ft}$. Fractured zones have times great than 110 $\mu\text{sec}/\text{ft}$ to off-scale (> 240 $\mu\text{sec}/\text{ft}$). Prominent fractured intervals occur at:

3,045 – 3,052 ft bpl
 3,068 – 3,090 ft bpl
 3,116 – 3,226 ft bpl
 3,142 – 3,148 ft bpl
 3,170 – 3,202 ft bpl
 3,210 – 3,228 ft bpl
 3,244 – 3,266 ft bpl

3,400 – 3,495 Porous dolomitic limestone and calcareous dolostone. Transit times mostly in 50 to 80 μ sec/ft range. Fractured zone from 3,468 to 3,474 ft.

Dual Induction Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 – 2,298	Very uniform response (2 to 3 ohm-m) with minimal separation of tracks. Porous limestone
2,298 – 2,318	Increased resistivity (> 10 ohm-m) reflecting tight dolostone lithology
2,318 – 2,430	Deep resistivities in 3 to 6 ohm-m range. Porous limestone.
2,430 – 2,590	Variable resistivities, mostly greater than 10 ohm-m. Fractured dolostones are evident by low shallow resistivities (< 3 ohm-m) are greater separation of tracks.
2,590 – 2,810	Generally little variation in resistivity and minimal separation of tracks. Deep resistivities are mostly in the 3.5 to 8.0 ohm-range.
2,810 – 2,840	Interbedded dolostone and limestone. Tight dolostones have high resistivities whereas fractured dolostones (e.g., at 2,837 ft bpl) have shallow resistivities of less than 3 ohm-m
2,840 – 3,028	Porous limestone (or dolomitic limestone). Deep resistivities in the 2.5 to 3.2 ohm-m range.
3,028 – 3,500	Variable lithologies as manifested by highly variable resistivities. Fractured zones, as indicated by deep and medium resistivities of less than 3 ohm-m.

Flowmeter Log

Static and dynamic flowmeter logs were run on the 12.25 - inch diameter pilot hole from 1,880 to 3,500 ft bpl. The dynamic flowmeter log was performed at a pumping rate of

320 gpm. Flowmeter logs can provide information on the location of high-transmissivity zones. However, much of the tested strata produced no detectable water. The flowmeter log is therefore not useful for evaluating the relative degree of confinement provided by low productivity strata.

The bulk of the water produced during the flowmeter log entered the well between approximately 2,300 and 2,305 ft bpl (the uppermost fractured zone), with a lesser amount entering the well from between 2,470 and 2,516 ft bpl, which is another fractured zone.

The 2,432 ft bpl fracture zone did not produce significant water.

The strata below 2,516 ft bpl were not stressed and produced essentially no water.

Borehole TelevIEWER

The borehole televIEWER is an acoustic imaging log that provides a detail, wrap-around image of the borehole wall. Borehole televIEWER logs are of great value in that they allow for observation of sedimentary structures and potential flow features such as fractures, vugs, and cavities. The log also provides information on sonic transit times and amplitudes which are expressed on the logs as shades of yellow, orange and brown (darker colors correspond to longer transit times and greater porosities).

<u>Depth (ft bpl)</u>	<u>Description</u>
1,910 - 1,946	Poor resolution
1,946 - 2,298.5	Horizontally bedded unfractured limestone. No significant vertical flow features are evident. Thin porous horizons are present (vuggy or burrow zones, which may be zones of enhanced horizontal flow).
2,298.5 - 2,308	Dolostones, vuggy horizons separated by intact beds.
2,308 - 2,323	Tabular cavities with some associated cavities. Does not appear to be entirely brecciated.
2,323 - 2,435.5	Horizontally bedded rock.
2,435.5 - 2,443	Zone with cavities and fractures. Some cavities are up to 2 ft thick.
2,443 - 2,502	Horizontally bedded rock with vuggy horizons.
2,502 - 2,525	Cavernous and fractured interval.
2,525 - 2,838	Horizontally bedded rock with vuggy horizons.

2,838 - 2,840.5	Cavernous interval
2,840.5 - 3,026	Horizontally bedded rock with vuggy horizons. Beds are intact.
3,026	Top of dolostones
3,026 - 3,498	Vuggy dolostone with cavernous and fractured intervals.
3,051 - 3,054	Cavernous zone
3,051 - 3,061	Fractures
3,070.5 - 3,720	Cavernous zone
3,078 - 3,096	Fractures
3,145 - 3,149	Cavernous intervals
3,208 - 3,216	Fractures
3,216 - 3,220	Cavernous interval
3,251 - 3,265	Cavernous zones and fractures
3,472.5 - 3,474.5	Cavernous zone

**Cement Top Temperature Logs Run on the 24-inch Casing of IW-1
(March 27 to April 2, 2010)
2,975 ft bpl to land surface**

The depth intervals of the casing that contain recently emplaced cement (with 24 hours) should have uniformly elevated temperatures except towards top where temperatures should gradually decrease to background levels. Gaps in the cement would be manifested by relatively cool zones. The cement top is usually located about 50 ft below the depth at which temperature returns to close to the background value (geothermal gradient). If curing proceeds too rapidly, the temperature will “flash” resulting in a spike in the temperature log.

The maximum temperatures recorded for the temperature logs were between 100 and 125 °F. No temperature spikes or cool spots are evident in the cement top temperature logs. The temperature tops estimated from the temperature logs and tagged depths are listed below

- Stage 1 log: Break in slope 2,800 ft bpl, (T = °60F), estimated top - 2,850 ft bpl, tagged - 2,875 ft bpl.
- Stage 2 log: Break in slope 2,740 ft bpl (T = °63F), estimated top - 2,790 ft bpl, tagged - 2,812 ft bpl.
- Stage 3 log: Break in slope 2,620 ft bpl (T = °64F), estimated top - 2,670 ft bpl, tagged - 2,676 ft bpl.
- Stage 4 log: Break in slope 2,500 ft bpl (T = °64F), estimated top - 2,550 ft bpl, tagged - 2,550 ft bpl.
- Stage 5 log: Break in slope 2,450 ft bpl (T = °60F), estimated top - 2,500 ft bpl, tagged - 2,486 ft bpl.

No logs were run for short stages 6 through 10.

- Stage 11 log: Break in slope 2,110 ft bpl (T = °67F), estimated top - 2,160 ft bpl, tagged - 2,148 ft bpl.
- Stage 12 log: Break in slope 1,925 ft bpl (T = °67F), estimated top - 1,975 ft bpl, tagged - 1,965 ft bpl.
- Stage 13 log: Break in slope 1,515 ft bpl (T = °72F), estimated top - 1,565 ft bpl, tagged - 1,543 ft bpl.
- Stage 14 log: Break in slope 920 ft bpl (T = °74), estimated top 970 ft bpl, tagged 951 ft bpl.

Stage 15 log: Break in slope 250 ft bpl ($T = 87^{\circ}\text{F}$), estimated top 300 ft bpl, tagged 328 ft bpl.

Stage 16 log: Initial sharp break in slope at 20 ft bpl.

Geophysical Log Interpretations

Hialeah ROWTP DZMW-1

Logs Run on the Nominal 40.5-inch Diameter Hole (Mar. 28, 2010) 0 to 157 ft bpl.

Caliper and Gamma Ray Logs

Log is not diagnostic of lithology because of the hole diameter. Confirmed the hole was open (> 40.5-inches in diameter bit size) to total depth. Enlarged hole (washout zone from 62 to 69 ft)

Cement Top Temperature Logs Run on the 30-inch Diameter Casing of DZMW-1 (Mar. 28, 2010) 0 to 157 ft bpl

Near constant temperature (87-88 °F) from 20 to 150 ft bpl. No suggestion of any gaps in the cement.

Logs Run on the Nominal 28.5-inch Diameter Hole (April 6, 2010) 140 to 1,070 ft bpl.

Caliper and Gamma Ray Logs

Low intensity gamma ray response due to large borehole diameter. Good match with well IW-1 and IW-2. Gamma ray peak markers are about 3 ft shallower in well DZMW-1 than in well IW-1. Borehole remains open and was suitable for the installation and cementing of the 17.75-inch diameter casing.

Dual Induction Log

<u>Depth (ft bpl)</u>	<u>Description</u>
20 - 440	Deep resistivity decreases from 20 to 6 ohm-m.
440 - 950	Sharp minor increase in resistivity, suggesting lithologic change to less clayey strata. Deep resistivities in 10 to 20 ohm-m range.
950 - 1,030	Decrease in resistivity (< 10 ohm-m) and increase in spontaneous potential.
1,030 - 1,065	Increase in resistivity (deep resistivity of 18 to 25 ohm-m) suggesting lithologic change to less clayey strata.

**Cement Top Temperature Logs Run on the 20-inch Diameter Casing of DZMW-1
(April 7, 2010)
0 to 1,070 ft bpl**

Cement stage 1 log – uniform response, mild variation, (100 to 108°F) between 160 and 1,055 ft bpl, with no suggestion of any anomalies. Temperature ranged between 95 and 100°F between 20 and 100 ft bpl.

**Logs Run on the Nominal 12.5-inch Diameter Borehole (April 11, 2010)
1,060 to 1,930 ft bpl.**

Comparison of gamma ray logs of wells DZMW-1 and IW-1 and indicate that the section (gamma ray markers) are about 3 feet shallower in well DZMW-1.

Caliper Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 – 1,440	Variable borehole diameter, ranges mostly from 13.0 to 16.5 inches.
1,440 – 1,930	Decrease in borehole diameter to 12.5 – 14.5 inches reflecting the presence of more competent limestone.

Gamma Ray Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 – 1,144	High gamma ray activities, mostly > 50 GAPI reflecting the presence of dispersed phosphate.
1,144 – 1,930	Reduced gamma ray activity, mostly 20 to 30 GAPI indicating the presence of purer limestone. Small sharp peak at 1,600 ft bpl, which is a local marker.

Dual Induction and Borehole Compensated Sonic Logs

<u>Depth (ft bpl)</u>	<u>Description</u>
1,075 – 1,144	Highly variable sonic transit time and resistivities reflecting lithological variability.
1,144 – 1,670	Pronounced downhole change to much less variable sonic transit times and resistivities. Transit times are mostly 120 to 130 μ sec/ft,

which indicates the presence of porous limestones. Gradual decrease in resistivity with depth which reflects increasing salinity. A few minor peaks of lower sonic transit times, which likely represent harder limestone or dolomitic beds.

1,670 - 1,750	Interval of more variable sonic transit times (negative peaks). Dolomitic limestone.
1,750 - 1,928	More uniform sonic transit times (105 to 115 $\mu\text{sec}/\text{ft}$) and sharply decreasing resistivity (deep decreases from about 10 to 2.8 ohm-m). Interval consists of porous limestone with sharply increasing salinities.

Flowmeter

<u>Depth (ft bpl)</u>	<u>Description</u>
1,140 - 1,150	Decrease dynamic flowmeter response, which is due to increased hole diameter.
1,150 - 1600	No flow zones evident, log suggests gradual flow into well.
1,600 - 1,740	More flow into well, no distinct zones.
1,740 - 1,930	Negligible flow contribution, no separation of static and dynamic logs.

Temperature and Fluid Resistivity Logs

<u>Depth (ft bpl)</u>	<u>Description</u>
1,060 - 1,930	Dynamic temperature ranges from 74 to 78°F, with an overall gradual decline. Fluid conductivity increases from about 14,000 to 30,000 $\mu\text{sec}/\text{cm}$, with no pronounced breaks.

Logs Run on the Nominal 18.5-inch Diameter Borehole (April 16, 2010) 1,050 to 1,905 ft bpl.

Comparison of gamma ray logs of wells DZMW-1 and IW-1 and indicate that the section (gamma ray markers) are about 3 feet shallower in well DZMW-1.

Caliper Log

<u>Depth (ft bpl)</u>	<u>Description</u>
1,070 - 1,440	Variable borehole diameter, ranges mostly from 18.5 to 25.0 inches; 27-Inch diameter peak at 1,075 ft bpl.
1,440 - 1,550	Very pronounced downhole change to more uniform borehole diameters; diameters are in a narrow range from 18.5 to 20.0 inches.

Gamma Ray Log

<u>Depth (ft bpl)</u>	<u>Description</u>
990 - 1,142	High gamma ray activity (10 to 115; mostly < 50 GAPI).
1,142 - 1,490	Sharp drop in gamma ray activity at 1,142 ft bpl marks the downhole transition to the relatively pure limestones of the Avon Park Formation. Low gamma ray activities (≤ 20 GAPI)
1,490 - 1,684	Interval of somewhat high and more variable gamma ray activity (10 to 20 GAPI) with a sharp peak at 1,600 ft bpl.
1,684 - 1,890	Low gamma ray activities (nearly entirely ≤ 15 GAPI)

Cement Top Temperature Logs Run on the 12.75-inch Casing of DZMW-1 (through April 19, 2010) 1,900 ft bpl to land surface

The cement top temperature logs record the increase in temperature from the heat of hydration of curing cement. The depth intervals of the casing that contain recently emplaced cement (with 24 hours) should have uniformly elevated temperatures except towards top where temperatures should gradually decrease to background levels. Gaps in the cement would be manifested by relatively cool zones. The cement top is usually located about 50 ft below the depth at which temperature returns to close to the background value (geothermal gradient)

- Stage 1 log: Temperature varied between 118 and 123 °F to 1,740 ft bpl. Temperature steadily decreased to 75°F at 1,655 ft bpl and reached background temperature of 72°F at 1,620 ft bpl. Tagged depth was 1,680 ft bpl.
- Stage 2 log: Temperature varied between 120 and 125 °F to 1,510 ft bpl. Temperature steadily decreased to 77°F at 1,390 ft bpl and approached background temperature of 72°F at about 1,350 ft bpl. Tagged depth was 1,417 ft bpl.

Stage 3 log: Temperature varied between 145 and 140 °F to 1,250 ft bpl. Temperature steadily decreased to 75°F at 1,150 ft bpl. Tagged depth was 1,214 ft bpl.

Stage 4 log: The maximum temperature of 147 °F occurred from 1,190 to 1170 ft bpl. Temperature steadily decreased to 130°F at 1,120 ft bpl and level off to 1,070 ft bpl. Temperature then decreased steadily to 100°F at 1,000 ft and leveled off. Temperature decreased again to 80°F at 820 ft bpl and approached a background temperature of about 79°F at 800 ft bpl. Tagged depth was 861 ft bpl.

The cement bond has no suggestion of gaps other issues that would affect the mechanical integrity of the well.

**Logs run on the nominal 11-inch diameter bore hole (April 24, 2010)
1,900 to 2,260 ft bpl.**

Comparison of gamma ray logs of wells DZMW-1 and IW-1 and indicate that the section (gamma ray markers) are about 3 feet shallower in well DZMW-1.

Caliper and Gamma Ray Logs

Borehole diameter close to 11-inch bit diameter. 13.0 to 13.7 inches from 1,900 to 1,940 ft bpl; mostly 12.3 to 13.0 inches from 1,940 to 2,250 ft bpl.

Dual Induction and Borehole Compensated Sonic Logs

Relatively uniform resistivities (deep ≈ 2 ohm-m) and sonic transit times (≈ 100 μ sec/ft) are indicative a fairly homogenous limestone lithology throughout logged interval.

Flowmeter Log

Log indicates gradual increase in flow into well, with a moderate flow zone at about 2,190 to 2,200 ft. Little flow contribution below 2,200 ft.

Temperature and Fluid Conductivity

Not diagnostic because of short logged interval.

**Cement Top Temperature Logs Run on the 6,625-inch FRP Casing of DZMW-1
(May 1, 2010)
2,185 to 2,260 ft bpl to land surface**

Stage 1 log: Temperature varied between approximately 130 and 135°F to 2,080 ft bpl, and then steady decreased to a near background temperature of 75°F at 2,015 ft bpl. Tagged depth was 2,040 ft bpl.

Stage 2 log: Maximum temperature of 136 to 139 °F at 2,030 to 2,040 ft bpl.
Temperature steadily decreased to 75°F at 1,960 ft bpl. Tagged depth was 1,973 ft bpl.

Stage 3 log: Short cement stage, 23 feet, log not diagnostic

The cement top temperature logs reveal not anomalies and are consistent with proper cementation of the 6.625-inch diameter casing.

**Cement Bond Logs Run on the 6,625-inch FRP Casing of DZMW-1
(May 3, 2010)
1,700 to 2,260 ft bpl to land surface**

Uncemented casing interval

Uncemented casing has the following properties: transit times of about 360 μ sec, amplitudes of 40 to 60 mV and string casing returns on the VDL log. The segment of uncemented casing from 1,684 to 1,950 ft shows a distinctive, characteristic pattern of positive transit time (\pm 410 μ sec), negative amplitude (10 to 20 mV), and weak casing returns on the VDL log at casing joints.

Cemented casing interval

Cemented casing in general is characterized by longer transit times, lower signal amplitudes, and weak casing arrivals on the VDL. Such a pattern is occurs below 1,950 on the CBL of DZMW-1. Of great importance is a good basal seal (2,158 to base) above the top of the lower monitoring zone.

The interval from 1,950 to 2,098 predominantly has a CBL log pattern indicated to good cement bonding. The interval from 2,098 to 2,158 ft contains some intervals with moderate to poor bonding.

The overall CBL log of the 6,625 is indicative of good cement bonding between the 6.625-inch and 12-inch borehole. Sufficient well bonded intervals are present to prevent the vertical migration of water through the annulus.

Appendix N

Appendix O

Appendix P

Appendix Q

City of Hialeah
Injection Well IW-1 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
0 – 12	Stainless steel surface pipe.
12 – 2,937	Interior of 16-inch diameter Fiberglass Reinforced Pipe. (2,939 ft bpl on side view camera) Joints occur at approximately 30 ft intervals. The fiber winding of the FRP is visible. Surficial scratch marks are from geophysical logging tools. There is no suggestion of cracking or other defects that would adversely impact the mechanical integrity of the well.
2,938 – 2,979	Interior of 24-inch diameter steel casing.
2,979	Bottom of 24-inch casing (2,981 ft bpl on sideview).
2,979 – 2,994	Dark crystalline dolomitic rock.
2,994	First flow zone. Water becomes cloudy and visible shimmering occurs.
2,994 - 3,030	Water cloudy. Borehole wall dark, rough dolomitic rock. Limited fracturing and sparse vugs.
3,030 – 3,049	Smooth, dark borehole. Water clearing. Some small vuggy intervals.
3,049 – 3,055	Lighter dolostone with some smaller voids and vugs.
3,055 – 3,059	First large fracture. In side view, deep, large open fracture.
3,059 – 3,084	Smooth borehole wall interspersed with vugs.
3,084 – 3,086	Large cavern. Borehole opens up from 3 o'clock to 6 o'clock. Horizontal extent not visible in downhole view. Other portions of borehole smooth, unfractured. Sideview shows large open cavern, extending back towards narrow open fracture.
3,086 – 3,097	Vuggy, rough borehole wall.
3,097 – 3,099	Fractured, vuggy borehole wall.
3,099 – 3,130	Generally smooth borehole with some vuggy intervals. Larger vugs in these intervals. In side view, flow zone visible at 3,117 ft bpl.
3,130 – 3,131	Small horizontal fracture/cavern.
3,131 - 3,142	Smooth borehole with limited fracturing.
3,142 – 3,148	Vuggy with increased fracturing/borehole collapse above cavern.

City of Hialeah
Injection Well IW-1 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
3,148 – 3,152	Large cavern. Side view camera shows very large open fractures/cavern extending out of the field of view of the camera.
3,152 – 3,160	Cavernous, fractured zone. Side view shows fractured blocks of dolostone.
3,160 – 3,180	Smooth borehole. Minimal vugs.
3,180 – 3,198	Vuggy and moderately rough borehole wall.
3,198 – 3,210	Vuggy zone with some narrow fractures.
3,210 – 3,222	Smooth borehole wall with some subvertical, narrow fractures.
3,222 – 3,223	Narrow horizontal fracture.
3,223 – 3,250	Moderately rough borehole wall with small abundant vugs.
3,250 – 3,258	Large subvertical fracture at 3 to 4 o'clock in downhole view.
3,258 – 3,259	Fracture opens up into cavern, horizontal extent not visible in downhole view. In side view, camera shows open fractures.
3,259 – 3,270	Zone of abundant, small fracturing and vugs in borehole wall.
3,270 – 3,297	Moderately rough borehole wall with abundant small to medium-sized vugs.
3,297 – 3,310	Smoother than interval above. Some small vugs
3,310 – 3,320	Medium sized vugs, subvertical fractures in borehole wall.
3,320 – 3,340	Borehole is rough with abundant vugs. Abundant fracturing in borehole wall. Fractures are narrow, subvertical.
3,340 – 3,346	Smooth at beginning of interval. Fracture (approximately 0.5 ft in vertical extent) at 3,344 ft bpl. Horizontal extent not visible in downhole view.
3,346 – 3,360	Moderately smooth borehole with some small vugs and slight roughness. Formation appears tight.
3,360 – 3,365	Large cavern opens. Sides not visible in downhole view. In side view, extensive, large open fractures extend out of field of view.
3,365 – 3,366	Borehole tightens, regains shape above second large cavern.

City of Hialeah
Injection Well IW-1 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
3,366 – 3,370	Large cavern, wall is not visible. In side view, extensive large open fractures. Extends beyond field of view in horizontal extent.
3,370 – 3,380	Abundant large fractures below cavern. Borehole not well formed. Larger open fracture at end of interval.
3,380 – 3,420	Moderately smooth borehole. Some sparse vugs. Generally tight well formed hole.
3,420 – 3,456	Rough vuggy borehole. Abundant small vugs and rough appearance. Minimal fracturing.
3,456 – 3,463	Large fracture/cavern. Large angular blocks of fractured dolostone visible in downhole view.
3,463 – 3,465	Borehole reforms above second cavern.
3,465 -3,467	Large cavern. Borehole walls not visible.
3,467 – 3,495	Smooth borehole. Limited vugs and fracturing.
3,495 – 3,509	Very rough and vuggy interval.
3,509	Bottom of borehole.

City of Hialeah

Injection Well IW-2 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
0 – 9	Stainless steel surface pipe.
9 – 2,933	Interior of 16-inch diameter Fiberglass Reinforced Pipe. Joints occur at approximately 30 ft intervals. The fiber winding of the FRP is visible. There is no suggestion of cracking or other defects that would adversely impact the mechanical integrity of the well.
2,933 – 2,975	Interior of 24-inch diameter steel casing.
2,975	Bottom of 24-inch casing (2,977 ft bpl on sideview.)
2,985 – 2,994	Limestone, pale orange in light. Borehole wall is smooth and formation appears tight.
2,994 – 3,003	Smooth limestone, first appearance of darker, dolomitic formation.
3,003 -3,023	Transition to harder dolomitic rock. Generally tight-appearing.
3,023 – 3,032	Large vugs in borehole wall. Borehole wall interspersed with small vugs.
3,032 – 3,035	High apparent porosity, abundant small vugs.
3,035 – 3,042	Generally smooth borehole with some small vugs.
3,042 – 3,048	Abundant vugs and some larger voids becoming smooth at end of interval.
3,048 - 3,055	Borehole opens to one side. Large vugs from 12 o'clock to 6 o'clock. Borehole enlarged. Limited subvertical fracturing and collapse of borehole.
3,055 – 3,060	Smooth, ovular borehole. Porous appearing.
3,060 – 3,068	Some larger vugs in otherwise smooth appearing borehole.
3,068 – 3,075	Borehole enlargement. Large vugs.
3,075 – 3,088	Smooth boring with smaller occasional vugs.
3,088 – 3,117	Occasional vugs becoming smoother. Borehole appears to have low porosity.

City of Hialeah
Injection Well IW-2 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
3,117 – 3,122	Borehole enlarged at beginning and end of interval. Otherwise, smooth.
3,122 – 3,140	Smooth borehole wall. Non-porous appearing.
3,140 – 3,148	Subvertical fracturing, large angular blocks detached from borehole wall. Cavernous zone.
3,148 – 3,170	Smooth boring, sparse vugs, not a good injection zone.
3,170 – 3,178	Large cavern, boring enlarges and sides not visible in downhole camera. Subvertical fracturing in borehole walls, blocks collapsed along borehole.
3,178 – 3,192	Smooth boring with narrow zones where sides of boring not visible at 3,182 and 3,192 ft bpl.
3,192 – 3,200	Large cavern at end of interval. Edge not visible in downhole view. Approximately 3 ft in vertical extent. Fractured detached blocks visible in cavernous zone. Side view shows extensive large open fractures.
3,200 – 3,210	Extensive subvertical fracturing in borehole wall.
3,210 – 3,215	Cavernous zone, fracturing of borehole wall. Large open fractures and angular blocks of dolostone hanging from borehole wall.
3,215 – 3,245	Smooth boring, sparse vugs, some small fracturing in borehole wall.
3,245 – 3,252	Smaller cavern, smaller fractured dolostone blocks visible in downhole view.
3,252 – 3,256	Smooth boring with small fracturing in borehole wall.
3,256 – 3,261	Fracturing, borehole enlargement, horizontal extent of feature not visible in downhole view. In side view, large open fractures visible.
3,261 – 3,305	Smooth boring, not a good injection zone. Non-porous appearing dolostone. Tight boring.
3,305 – 3,310	Some vugs in borehole wall.
3,310 – 3,320	Some vertical to subvertical fracturing in borehole wall approaching cavernous zone below.
3,320 – 3,327	Large cavern (>3 ft). In side view, large angular blocks of dolostone visible in large open fracture.

City of Hialeah
Injection Well IW-2 Video Log Description

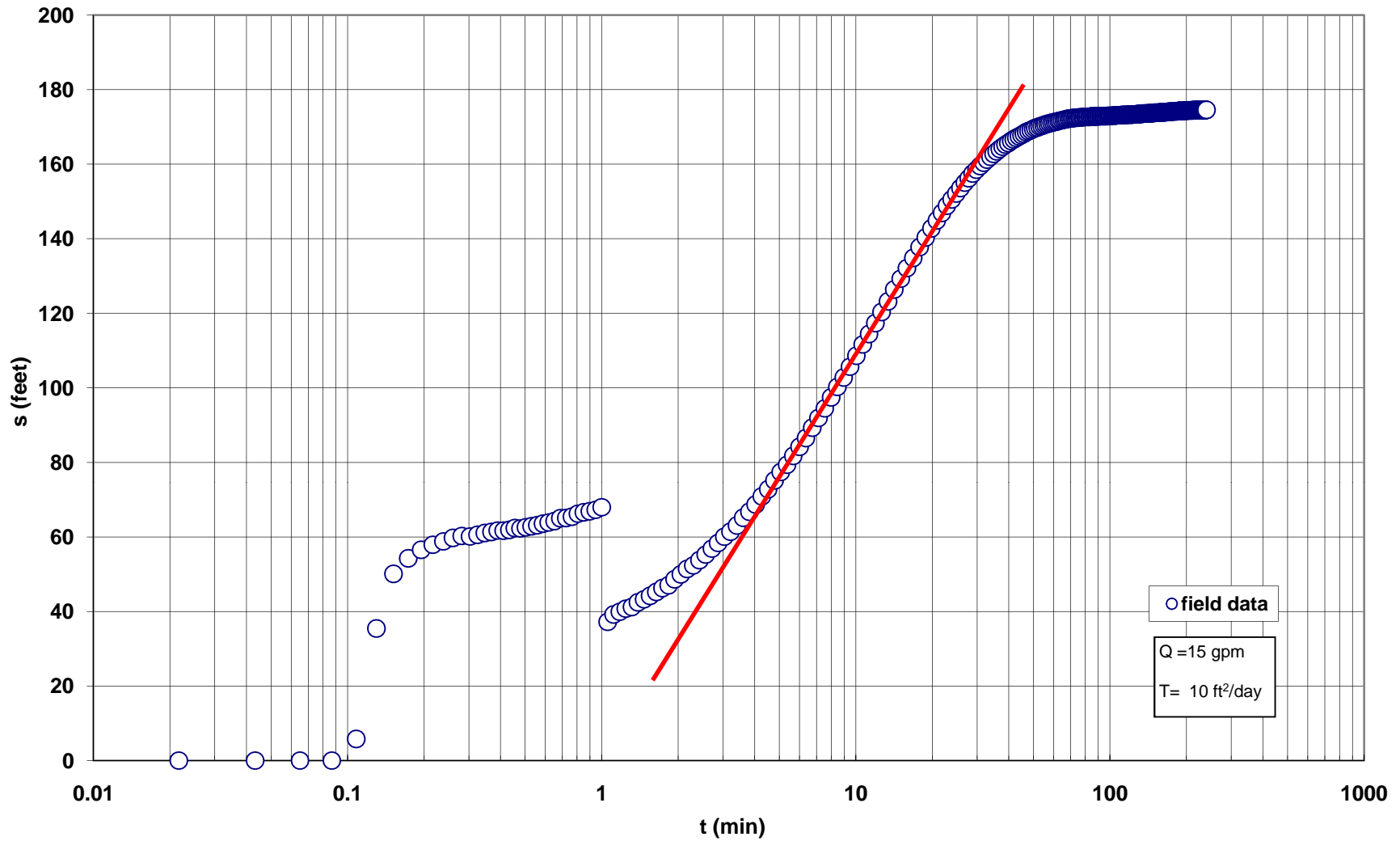
<u>Depth (ft bpl)</u>	<u>Description</u>
3,327 – 3,342	Fracturing in vuggy borehole wall through interval.
3,342 – 3,363	Smooth boring, limited smaller vugs.
3,363 – 3,364	Cavern 2 ft in vertical extent. Edge not visible in downhole view. In side view, feature rapidly narrows to narrow horizontal fracture.
3,364 – 3,380	Borehole wall pock marked, vuggy.
3,380 – 3,430	Smooth boring, non-porous appearing.
3,430 – 3,455	Borehole wall vuggy becoming smoother with sparse larger vugs towards end of interval.
3,455 – 3,468	Smooth boring.
3,468 – 3,471	Large cavern, edge not visible in downhole view. In side view, camera shows large open fracture.
3,471 – 3,485	Smooth boring.
3,485 – 3,503	Borehole wall marked with vugs. Camera has reached total depth of borehole.

City of Hialeah
Dual-Zone Monitor Well DZMW-1 Video Log Description

<u>Depth (ft bpl)</u>	<u>Description</u>
0 – 2,190	Interior of 6 5/8-inch diameter Fiberglass Reinforced Pipe. Joints occur at approximately 30 ft intervals. The fiber winding of the FRP is visible. Surficial scratch marks are from geophysical logging tools. There is no suggestion of cracking or other defects that would adversely impact the mechanical integrity of the well.
2,198	Bottom of packer.
2,198 – 2,205	Smooth limestone, pale, white in color. Tight appearing.
2,206 – 2,210	Coarser texture, sandy limestone, light brown.
2,210 – 2,213	Pale color, smooth texture.
2,213 – 2,219	Coarse, sandy appearance.
2,219 – 2,220	Smooth borehole, light color with some vugs.
2,220 – 2,223	Darker, visible bedding, coarse texture.
2,223 – 2,224	Pale color, smooth texture.
2,224 – 2,226	Coarse, light brown, porous appearance.
2,226 – 2,240	Smooth borehole, some visible bed layering, light color.
2,240 – 2,244	Pale, smooth.
2,245	Dark bed.
2,245 – 2,250	Generally smooth with some small void spaces.
2,250 – 2,256	Smooth, pale color.
2,256 – 2,258	Coarse, rough texture.
2,258 – 2,262	Dark, rugose.
2,262	Bottom of boring.

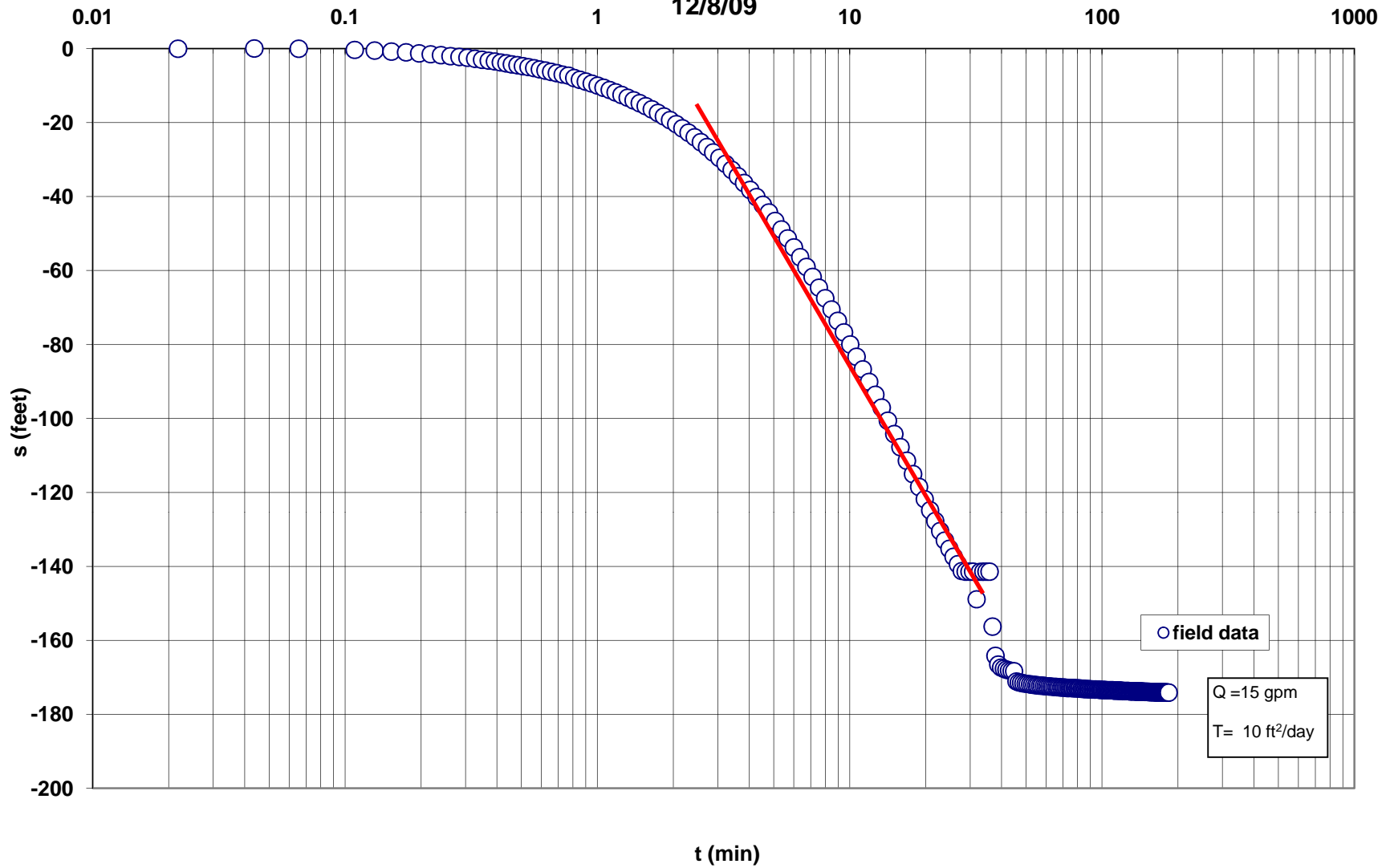
Appendix R

City of Hialeah
IW-1 Packer Test No. 1 (1,839-1,856 feet bpl)
12/8/09

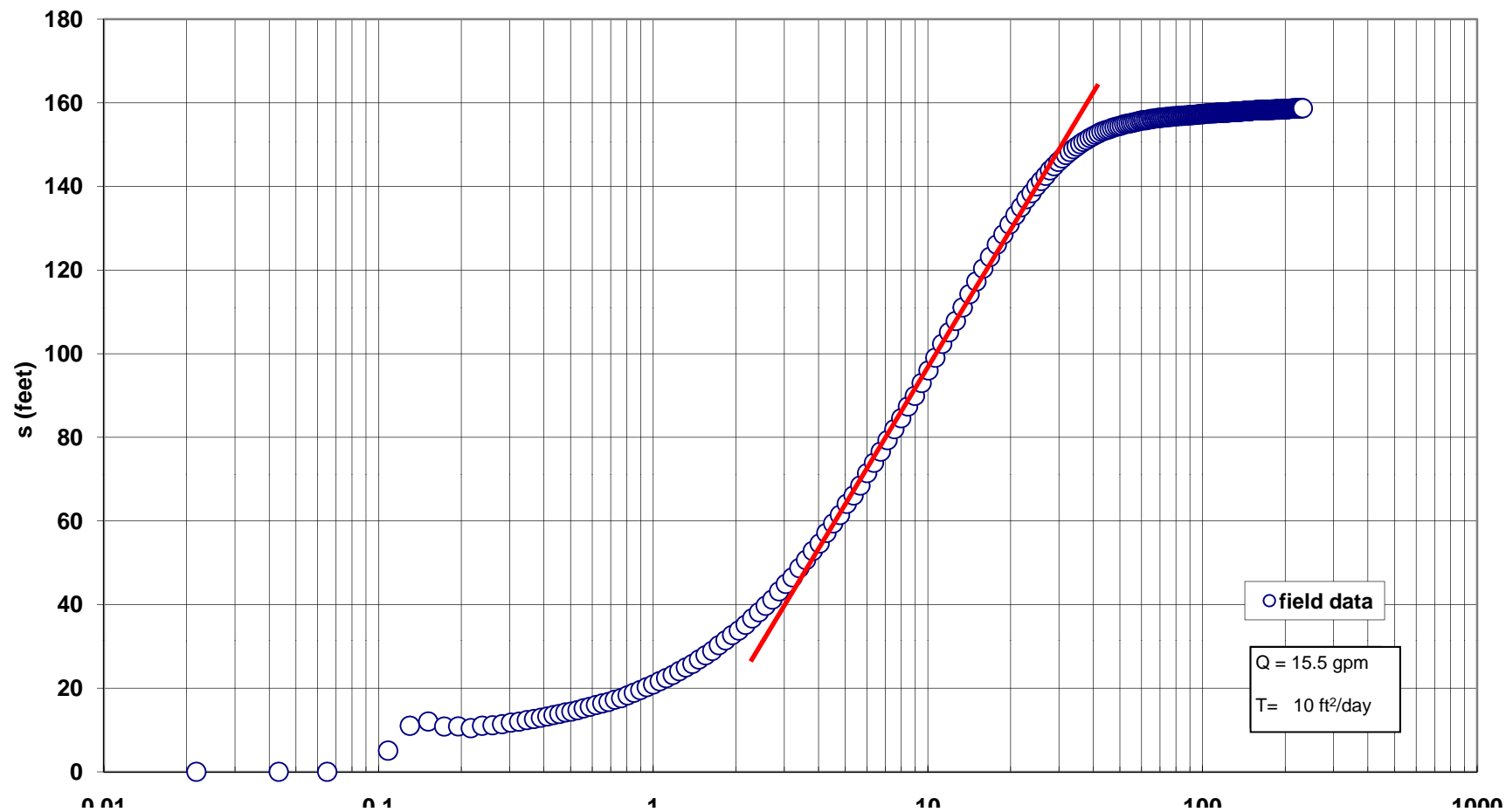


City of Hialeah
IW-1 Packer Test No. 1 (1,839-1,856 feet bpl)

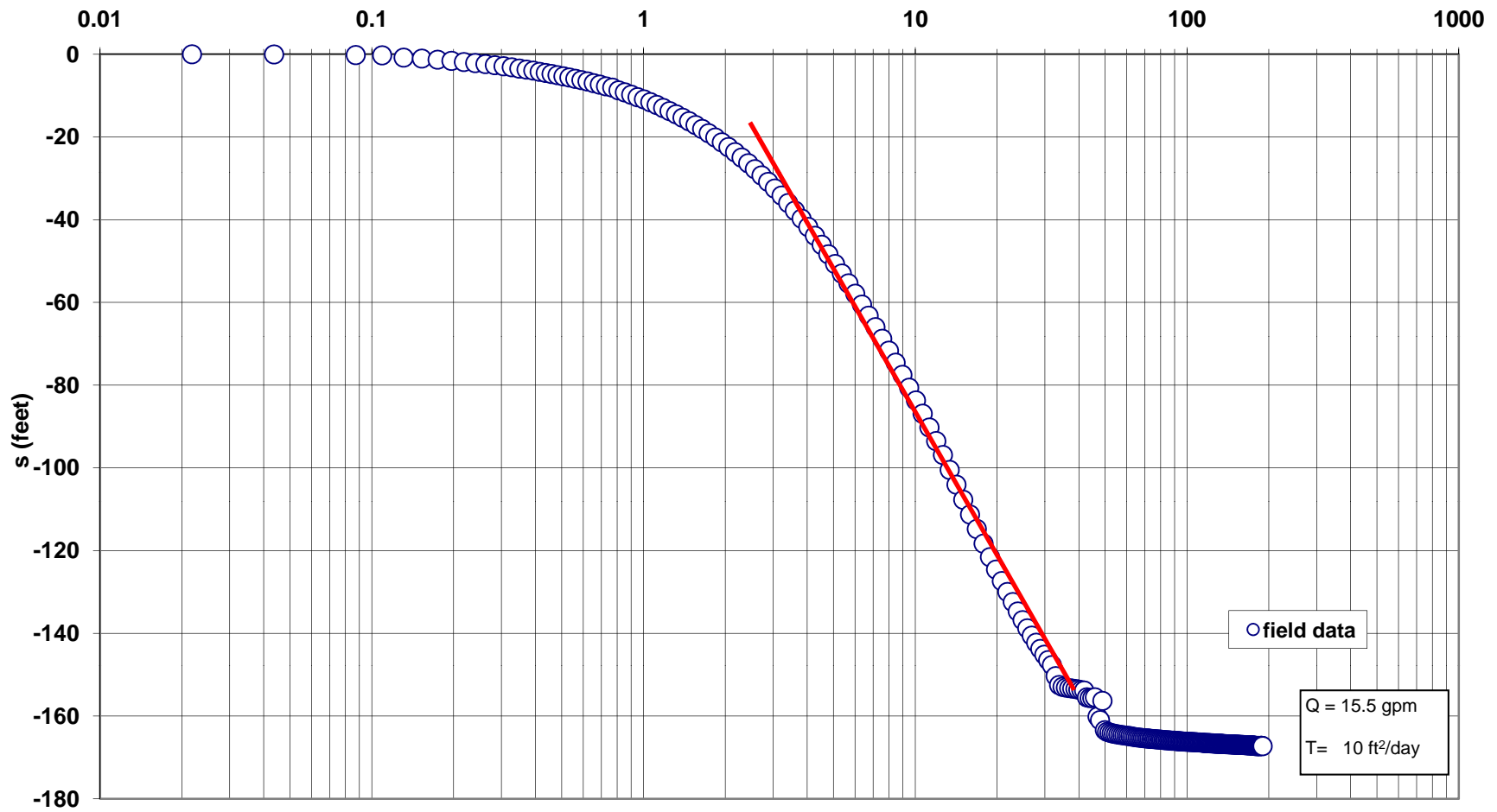
12/8/09



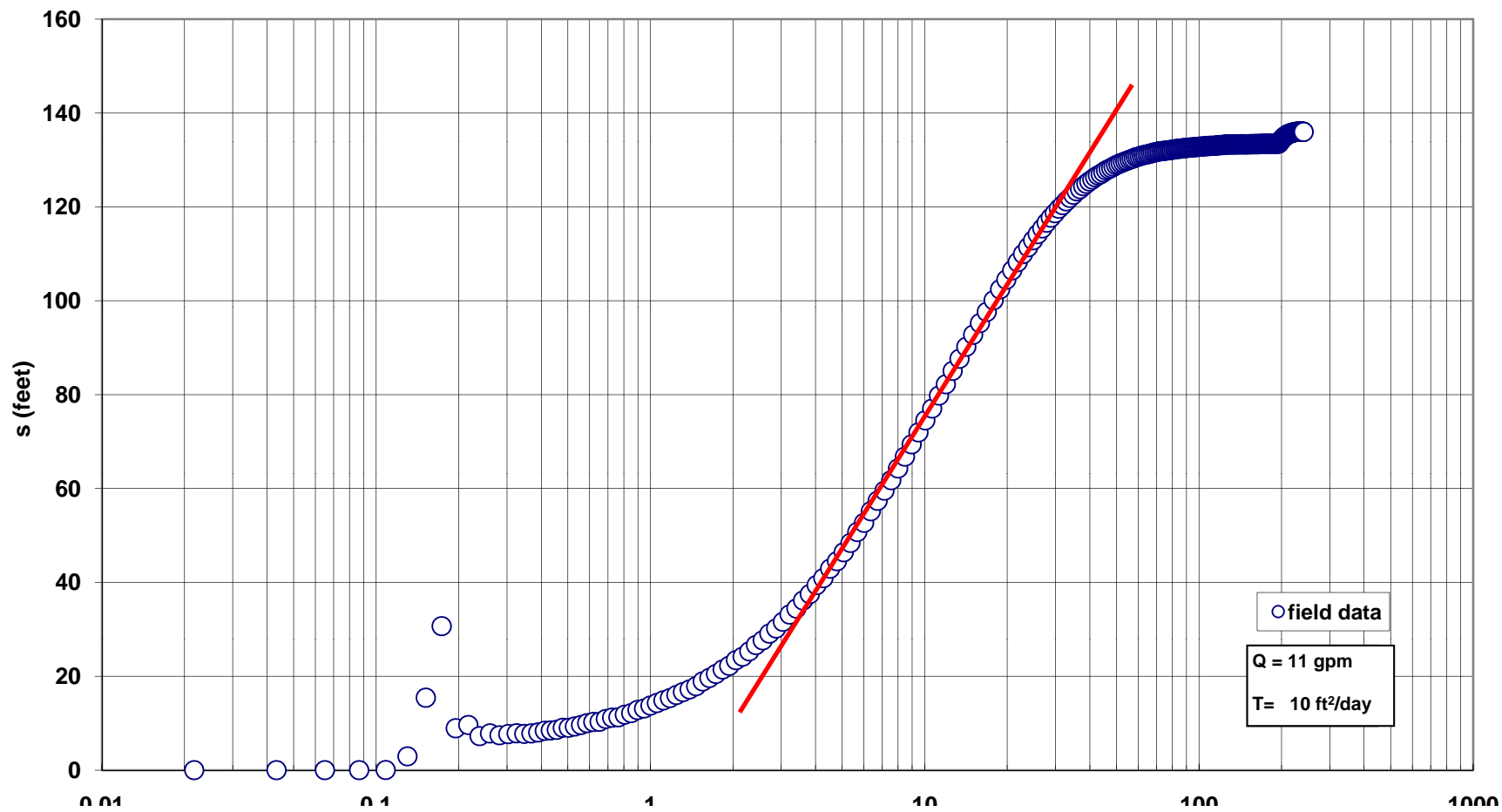
City of Hialeah
IW-1 Packer Test No. 2 (1,899-1,916 feet bpl)
12/9/09



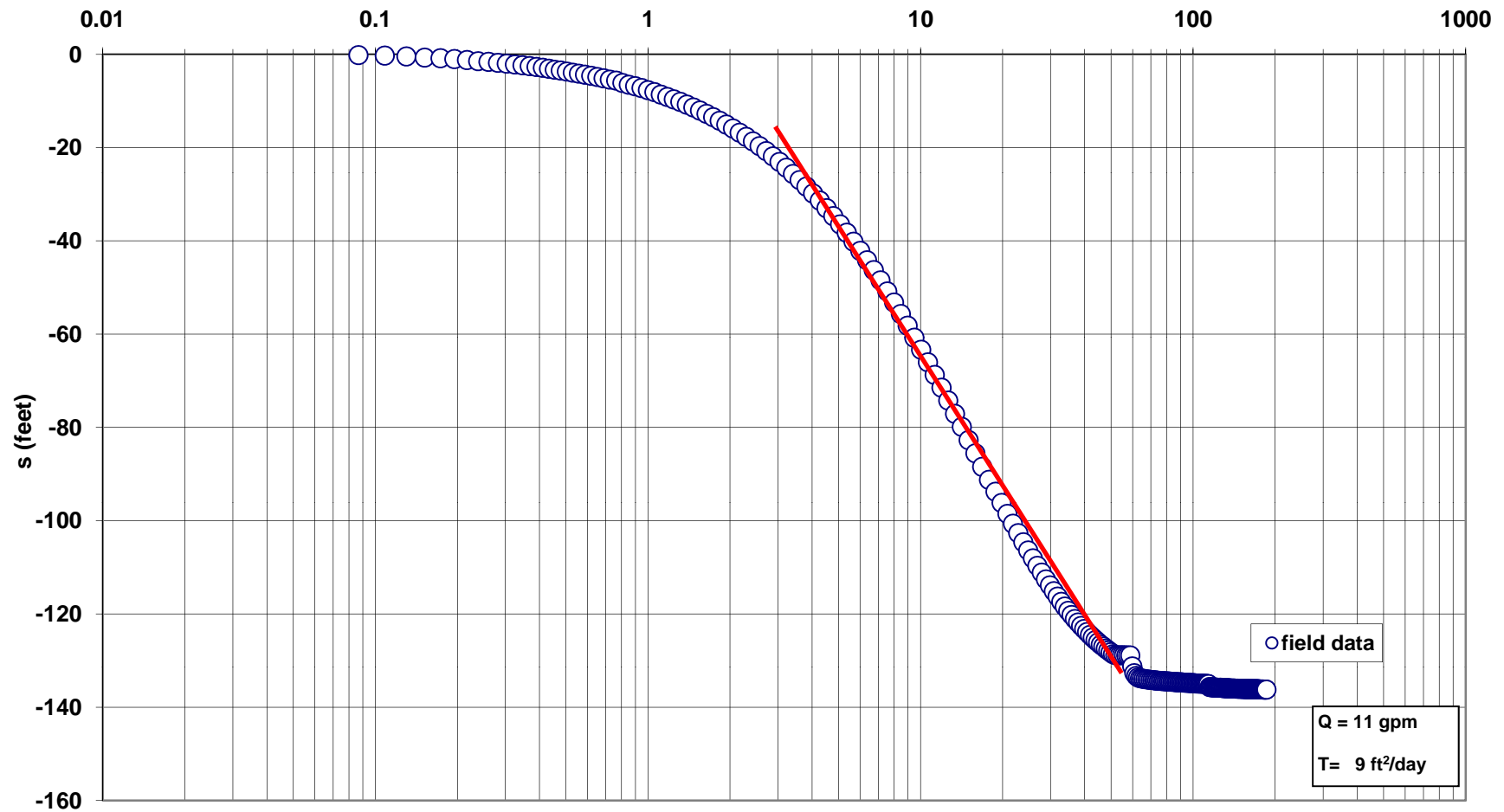
City of Hialeah
IW-1 Packer Test No. 2 (1,899-1,916 feet bpl)
12/9/09



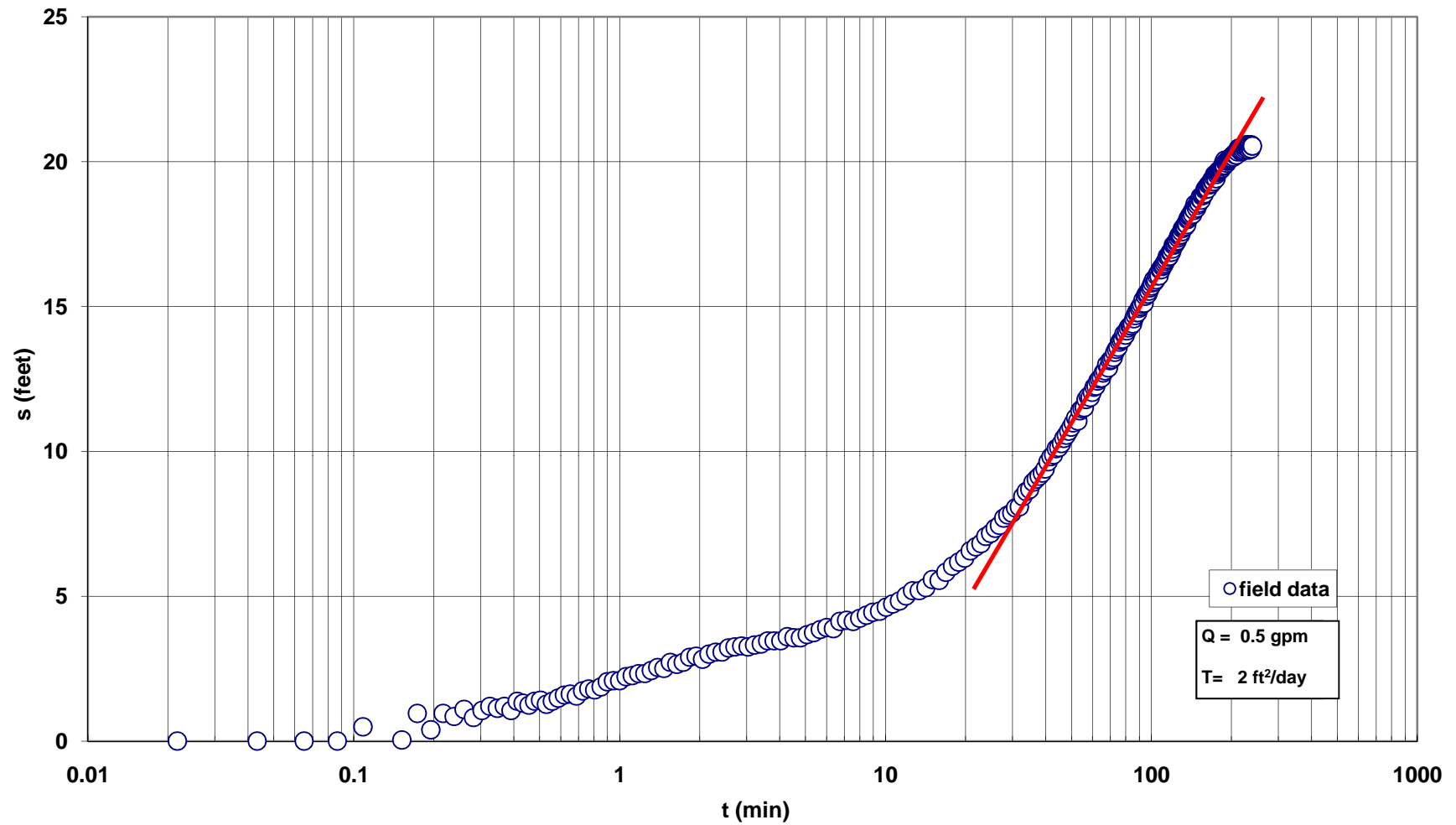
City of Hialeah
IW-1 Packer Test No. 3 (1,974-1,991 feet bpl)
12/12/09



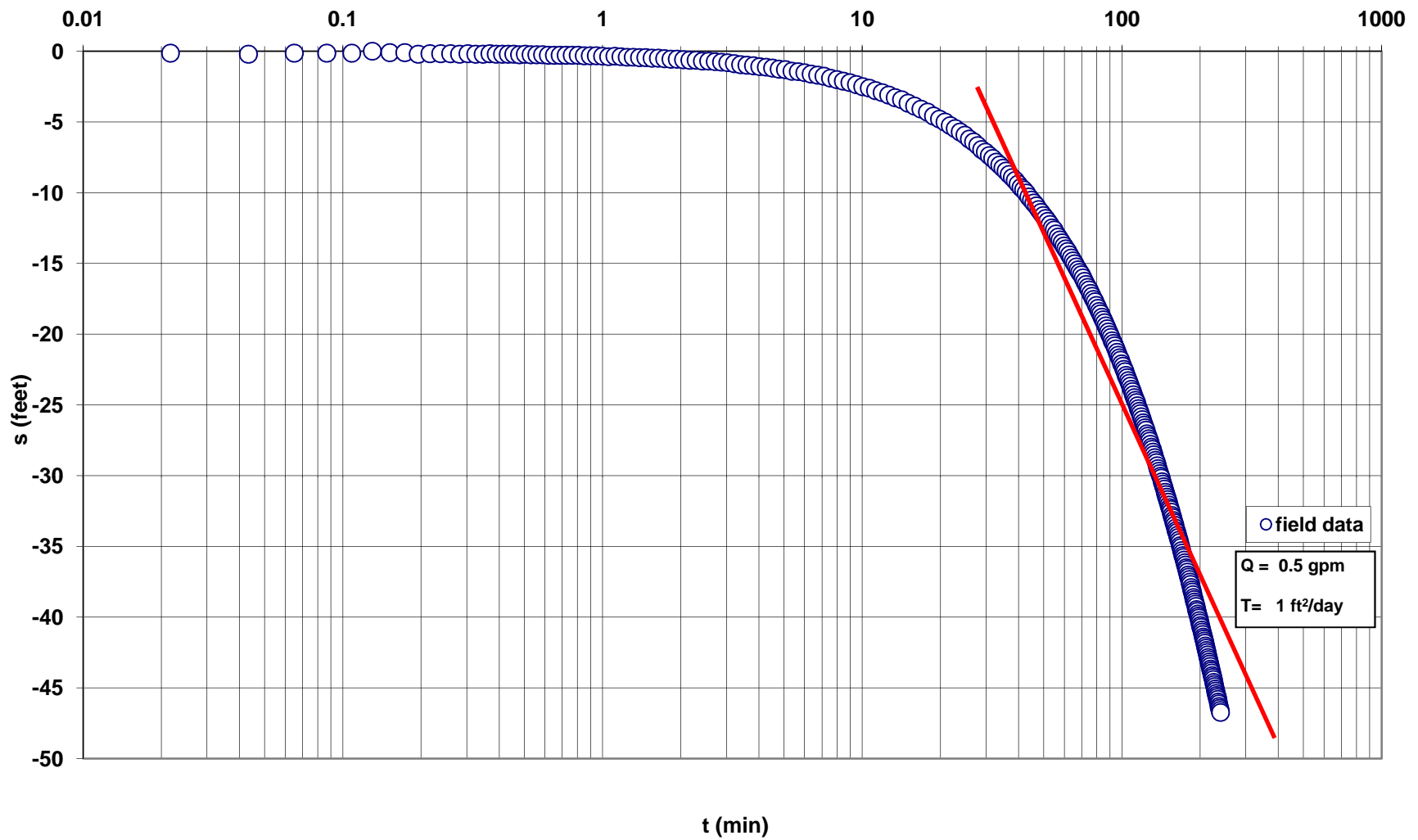
City of Hialeah
IW-1 Packer Test No. 3 (1,974-1,991 feet bpl)
12/12/09



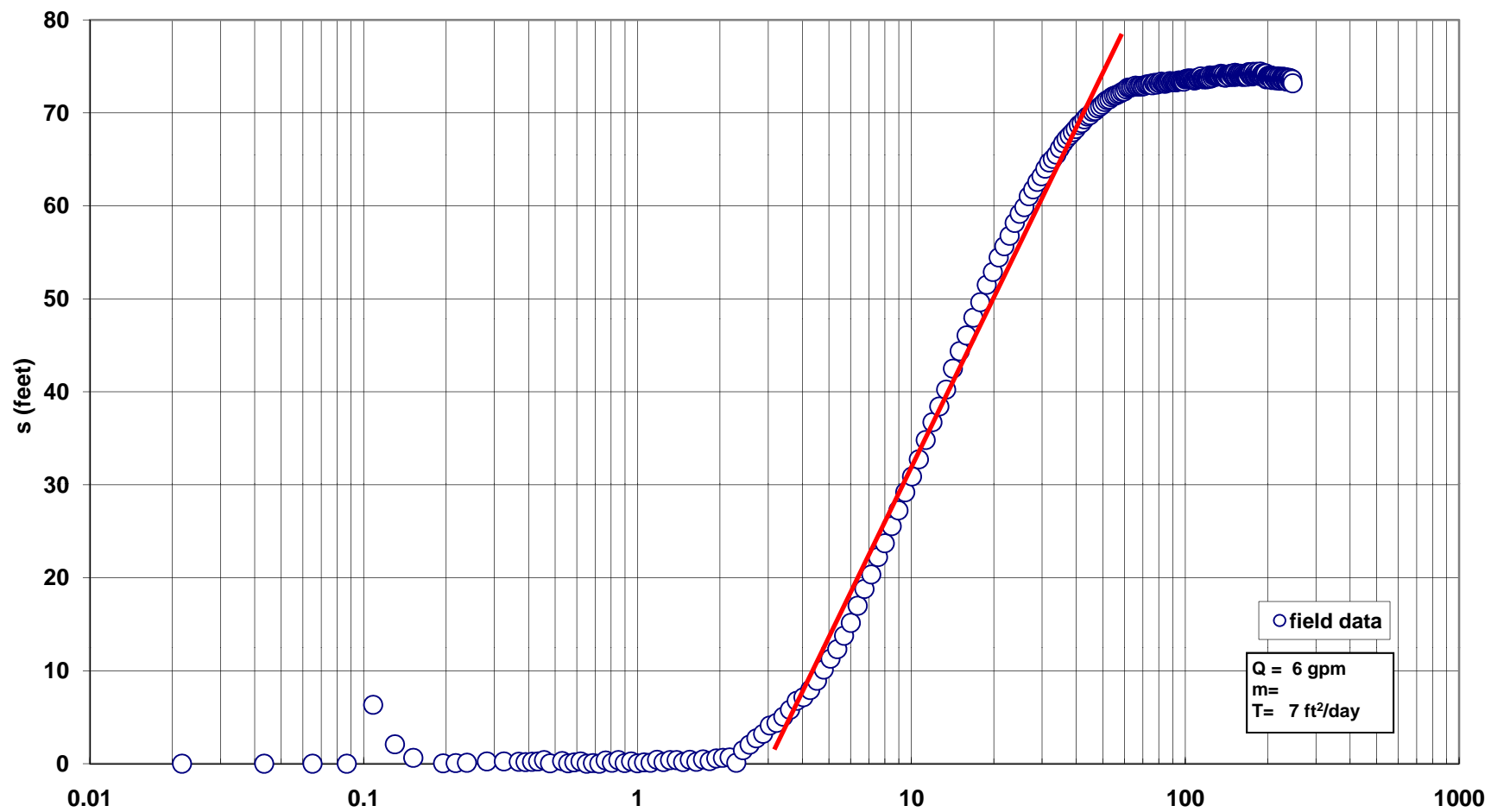
City of Hialeah
IW-1 Packer Test No. 4 (2,234 - 2,252 feet bpl)
1/26/10-1/27/10



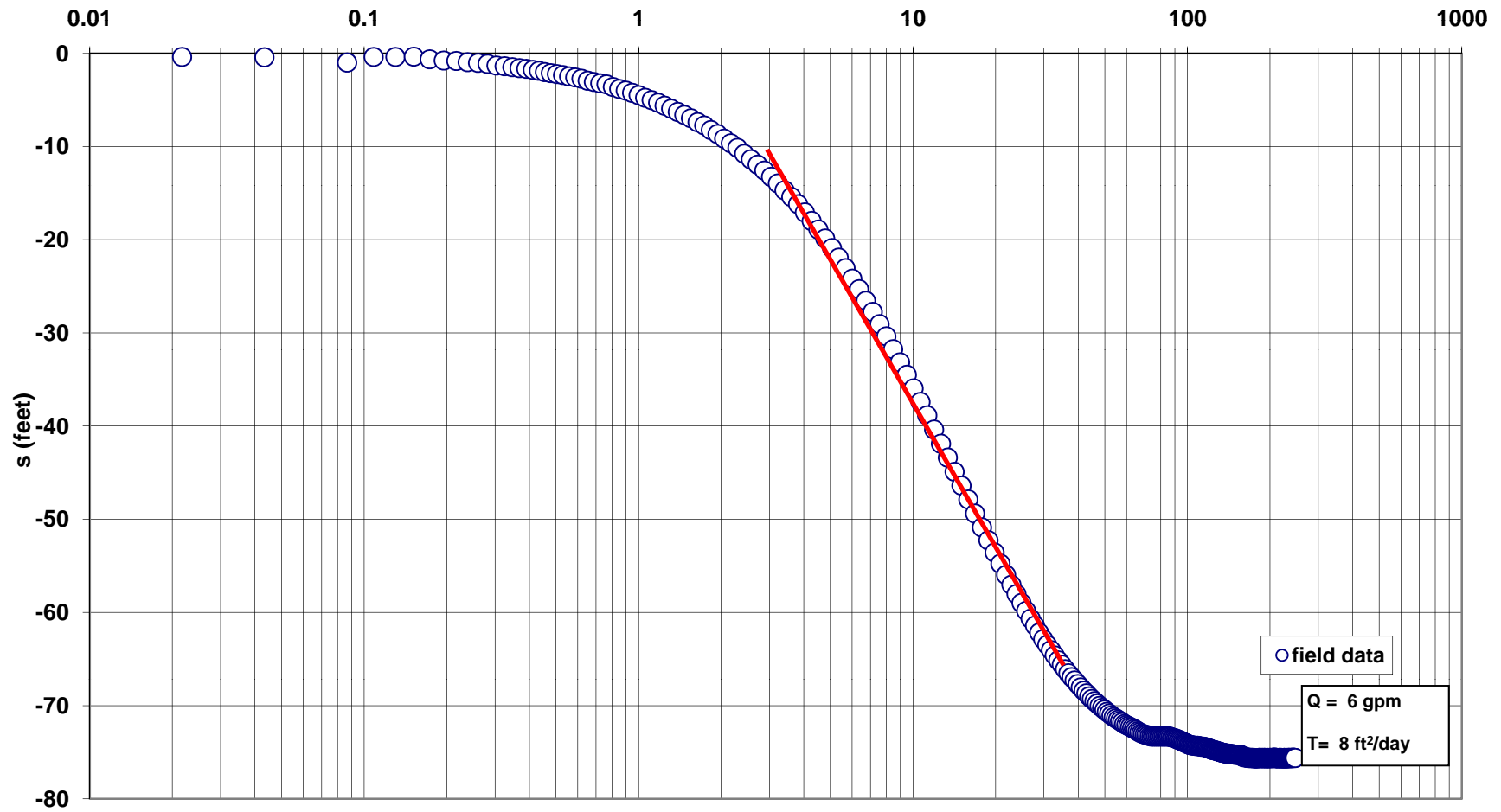
City of Hialeah
IW-1 Packer Test No. 4 (2,234 - 2,252 feet bpl)
1/26/10-1/27/10



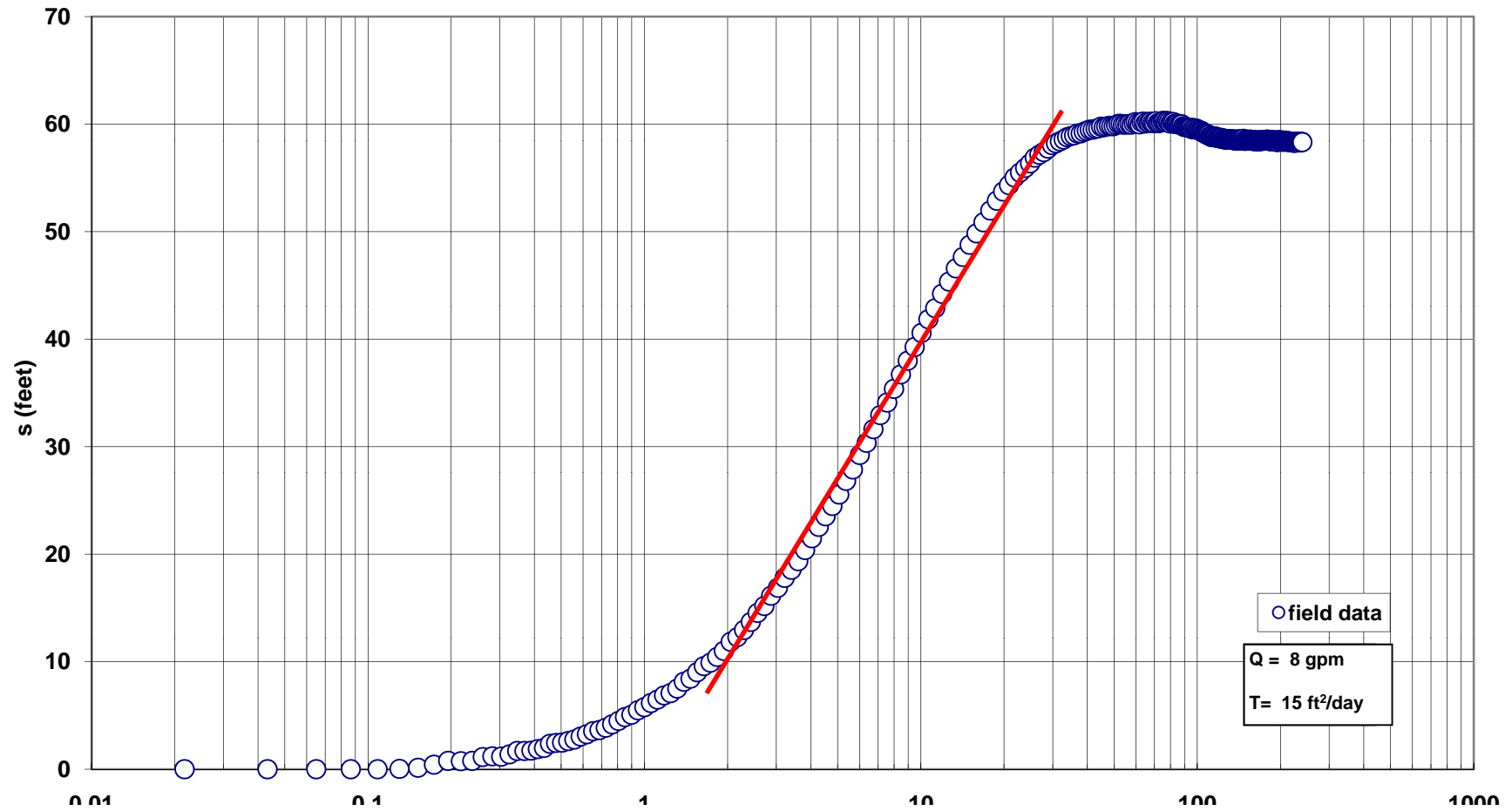
City of Hialeah
IW-1 Packer Test No. 5 (2,399 - 2,417 feet bpl)
1/28/10



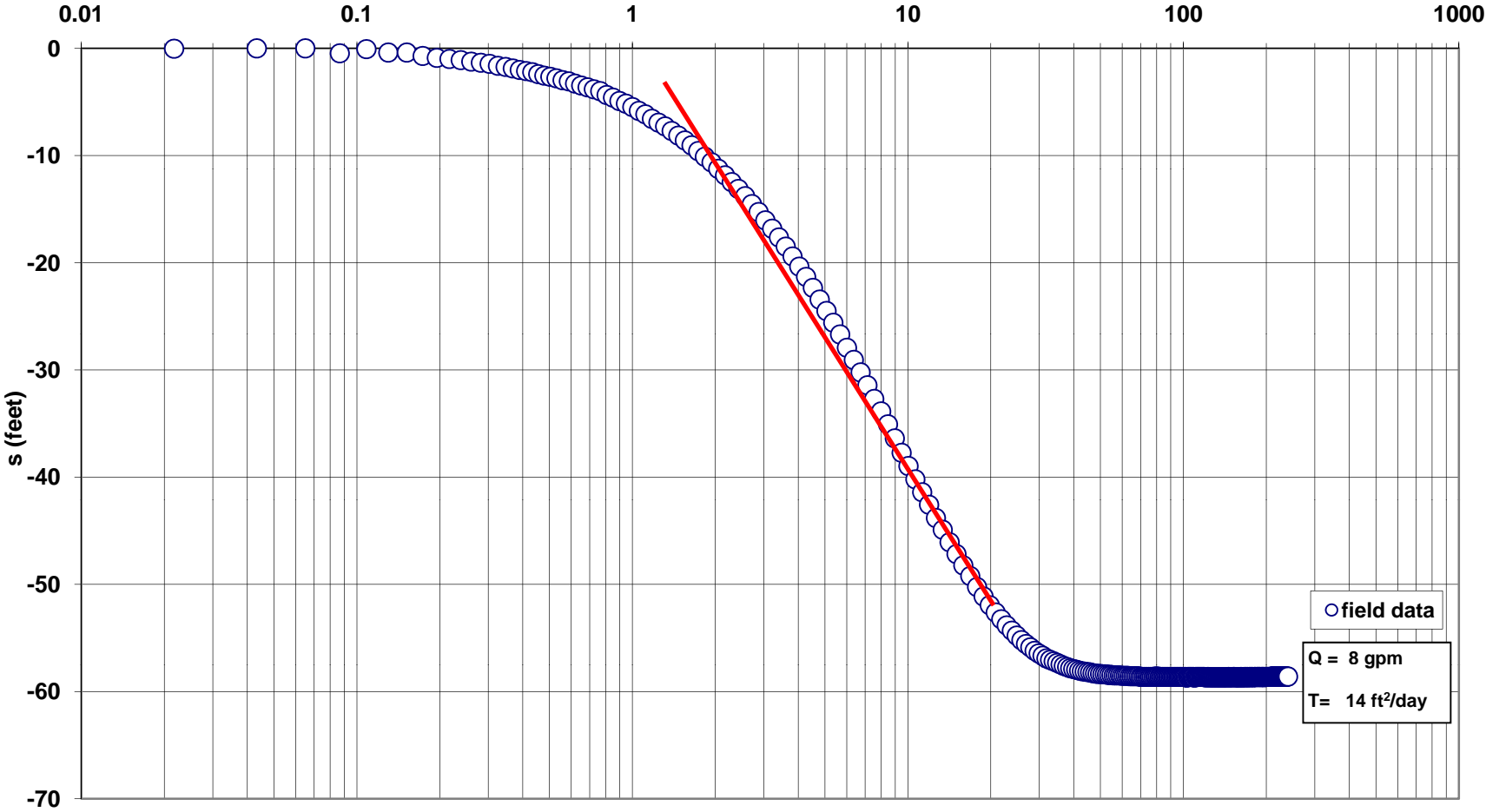
City of Hialeah
IW-1 Packer Test No. 5 (2,399 - 2,417 feet bpl)
1/28/10



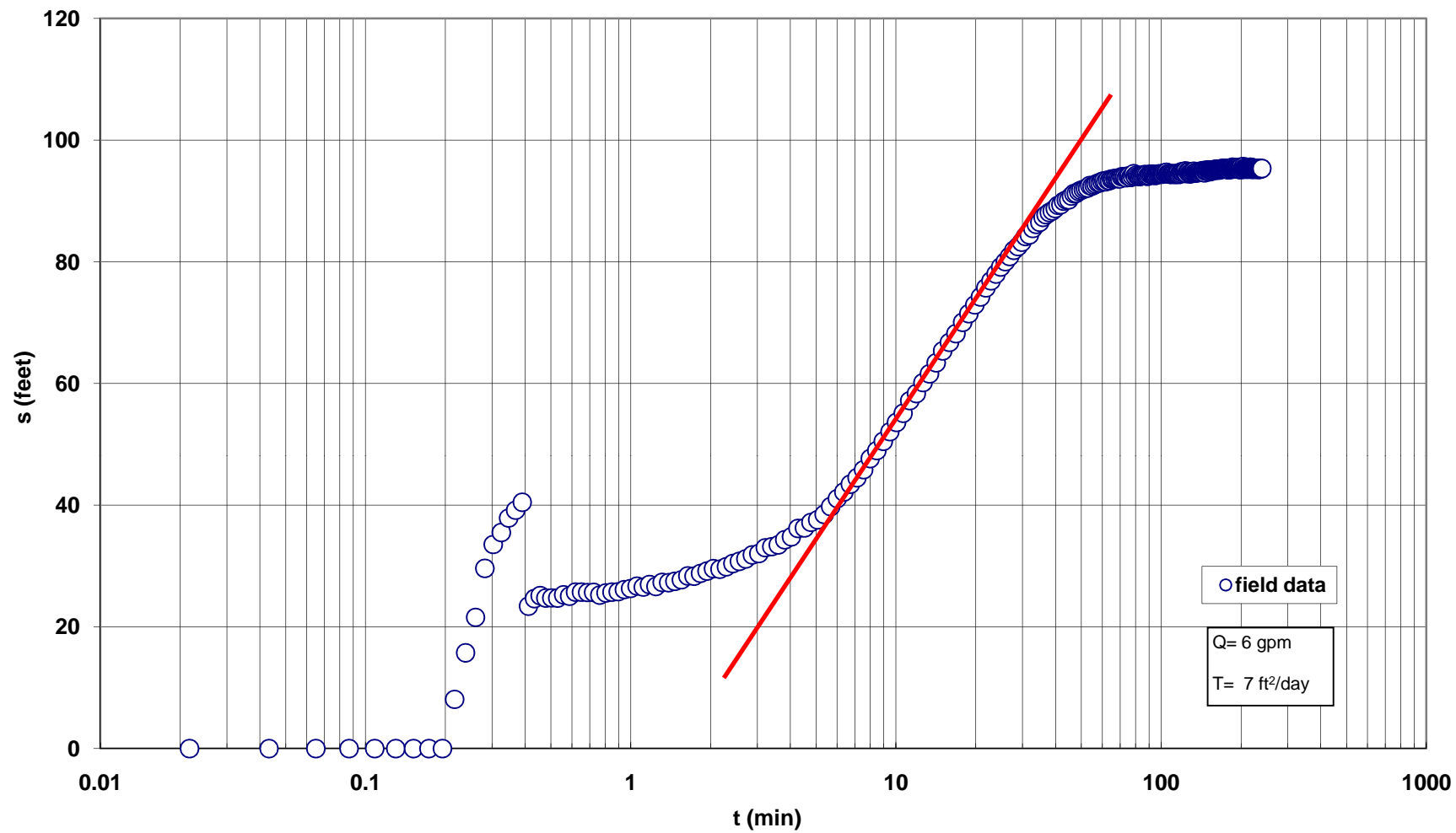
City of Hialeah
IW-1 Packer Test No. 6 (2,639 - 2,656.5 feet bpl)
1/29/10



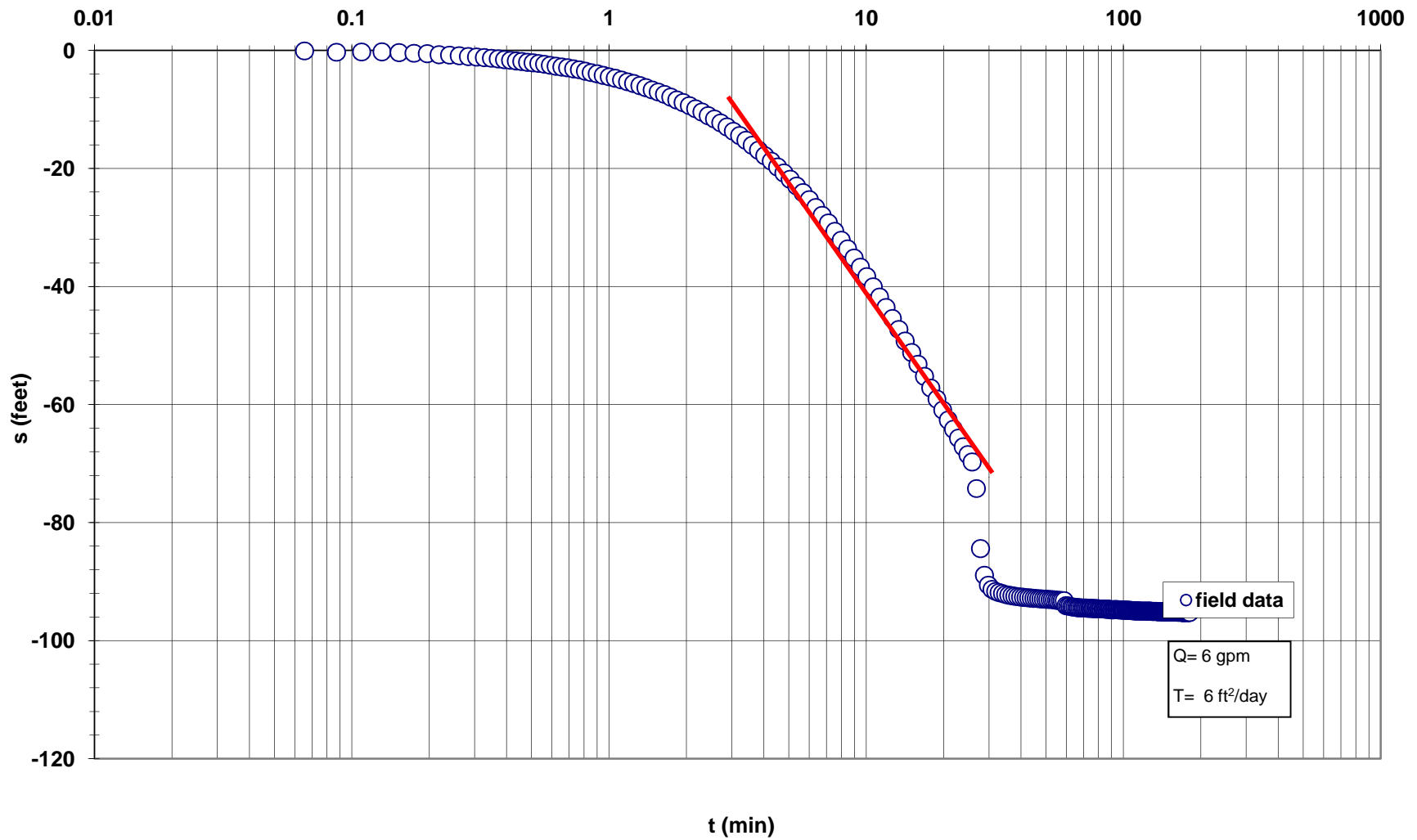
City of Hialeah
IW-1 Packer Test No. 6 (2,639 - 2,656.5 feet bpl)
1/29/10



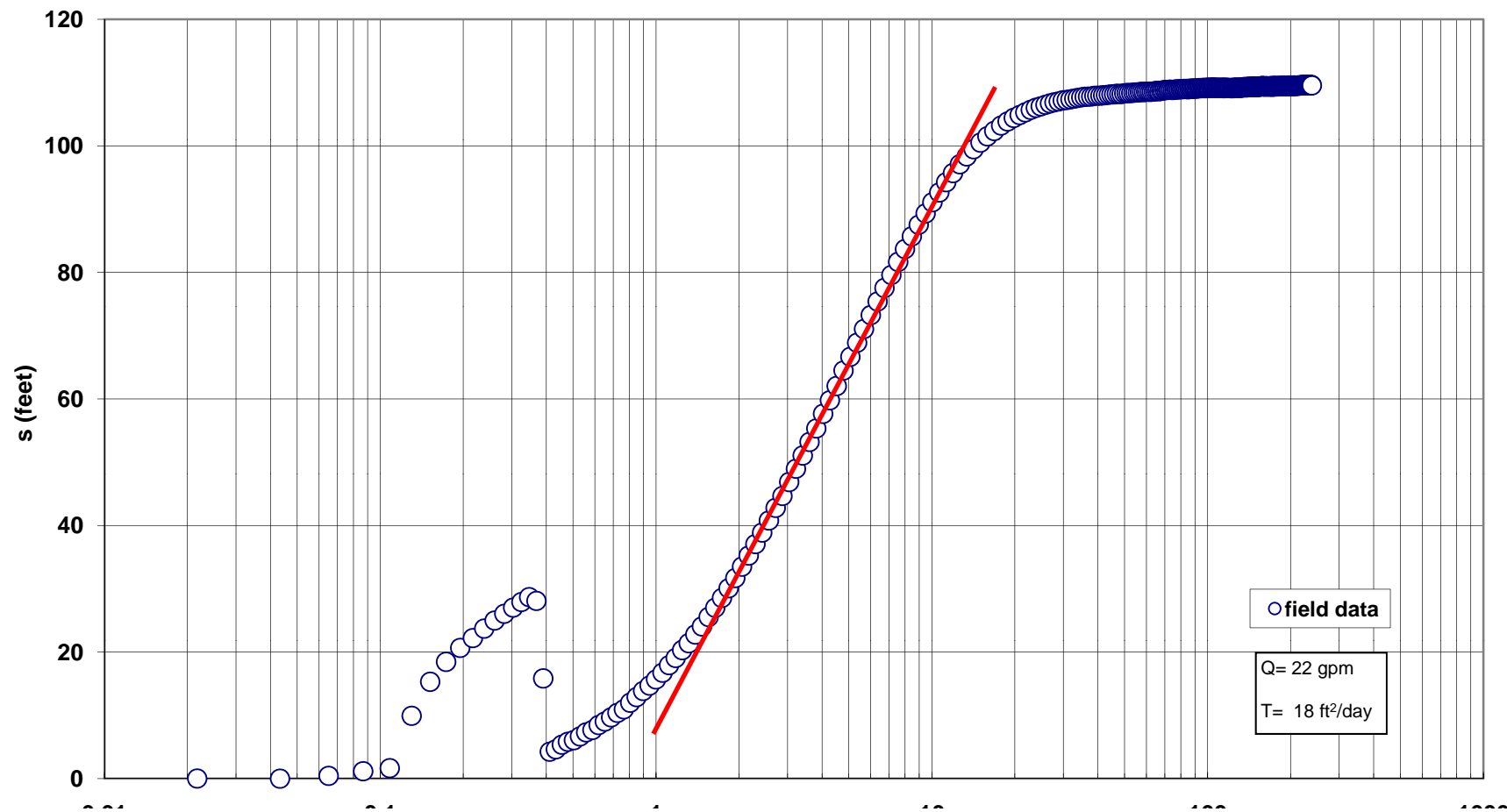
City of Hialeah
IW-2 Packer Test No. 1 (1,883.5-1,901 feet bpl)
12/21/09



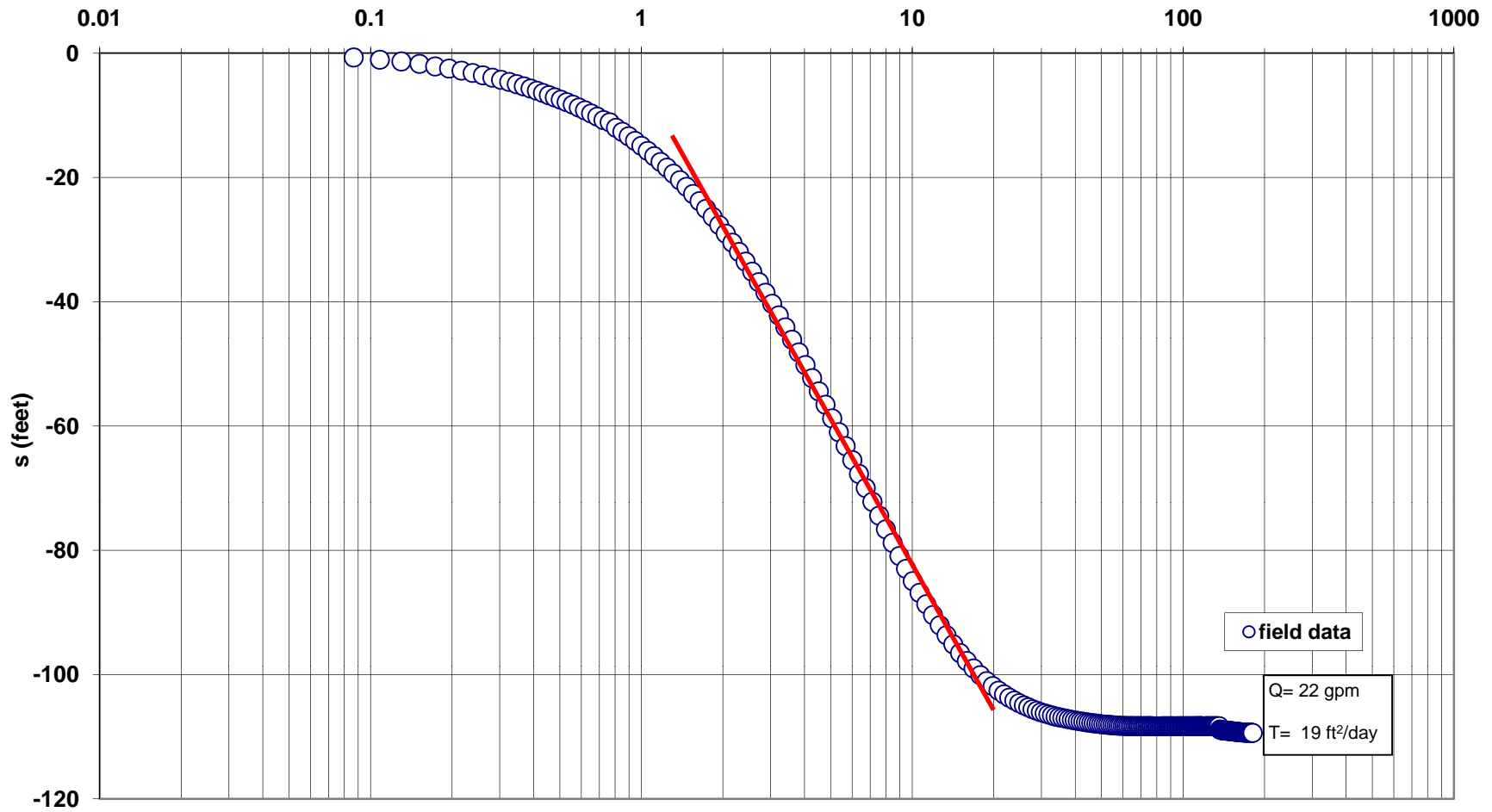
City of Hialeah
IW-2 Packer Test No. 1 (1,883.5-1,901 feet bpl)
12/21/09



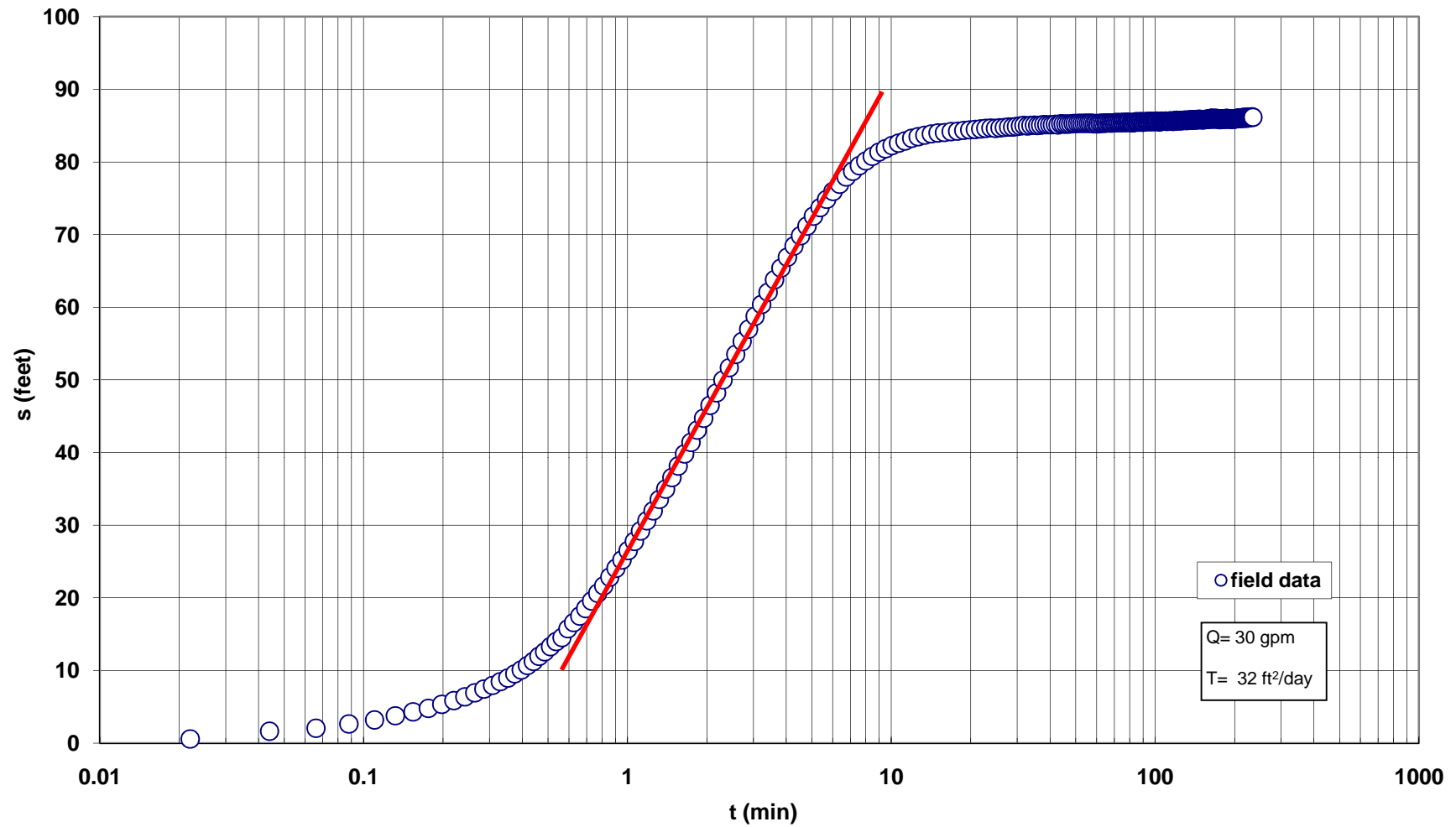
City of Hialeah
IW-2 Packer Test No. 2 (2,049-2,066.5 feet bpl)
02/08/10-02/09/10



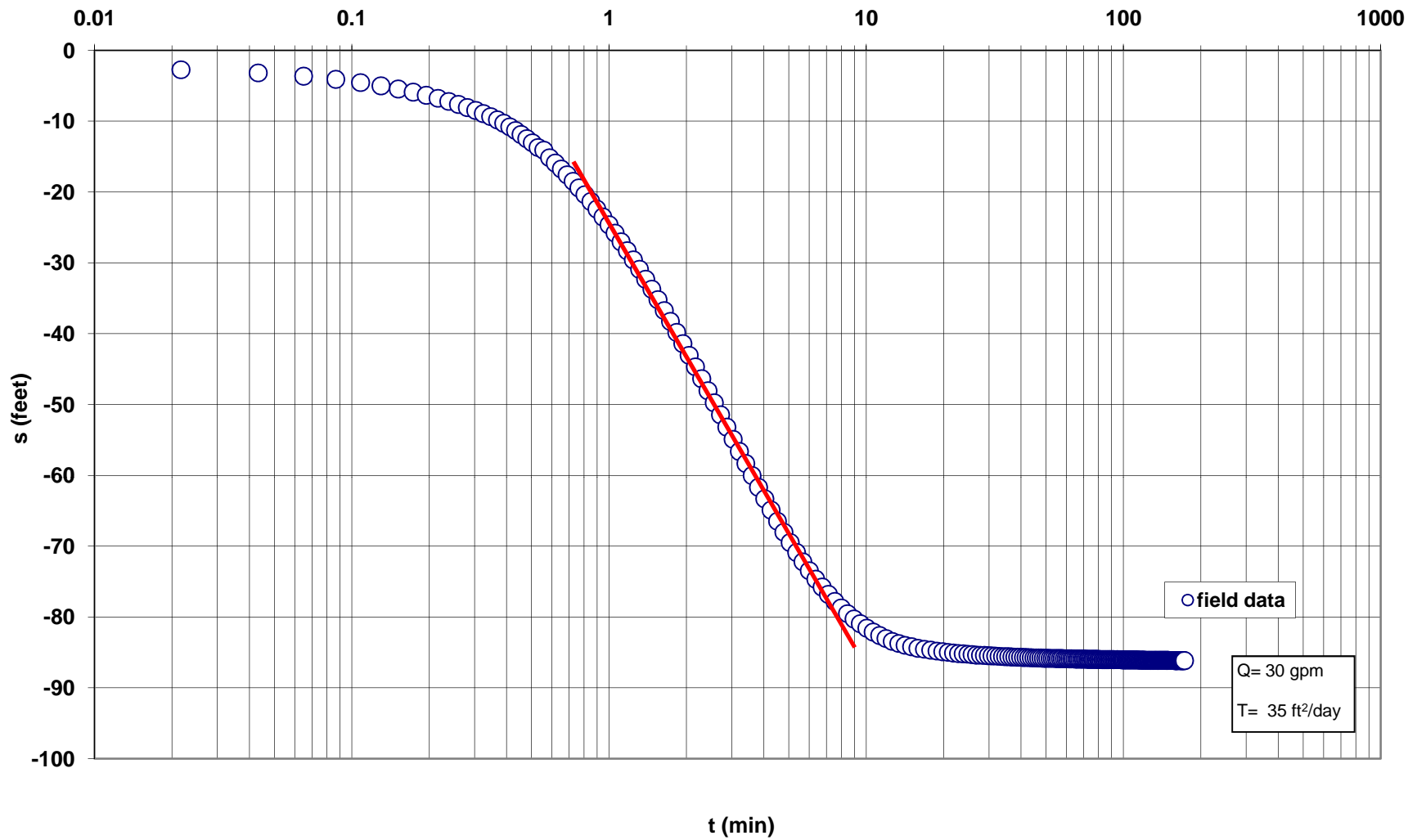
City of Hialeah
IW-2 Packer Test No. 2 (2,049-2,066.5 feet bpl)
02/08/10-02/09/10



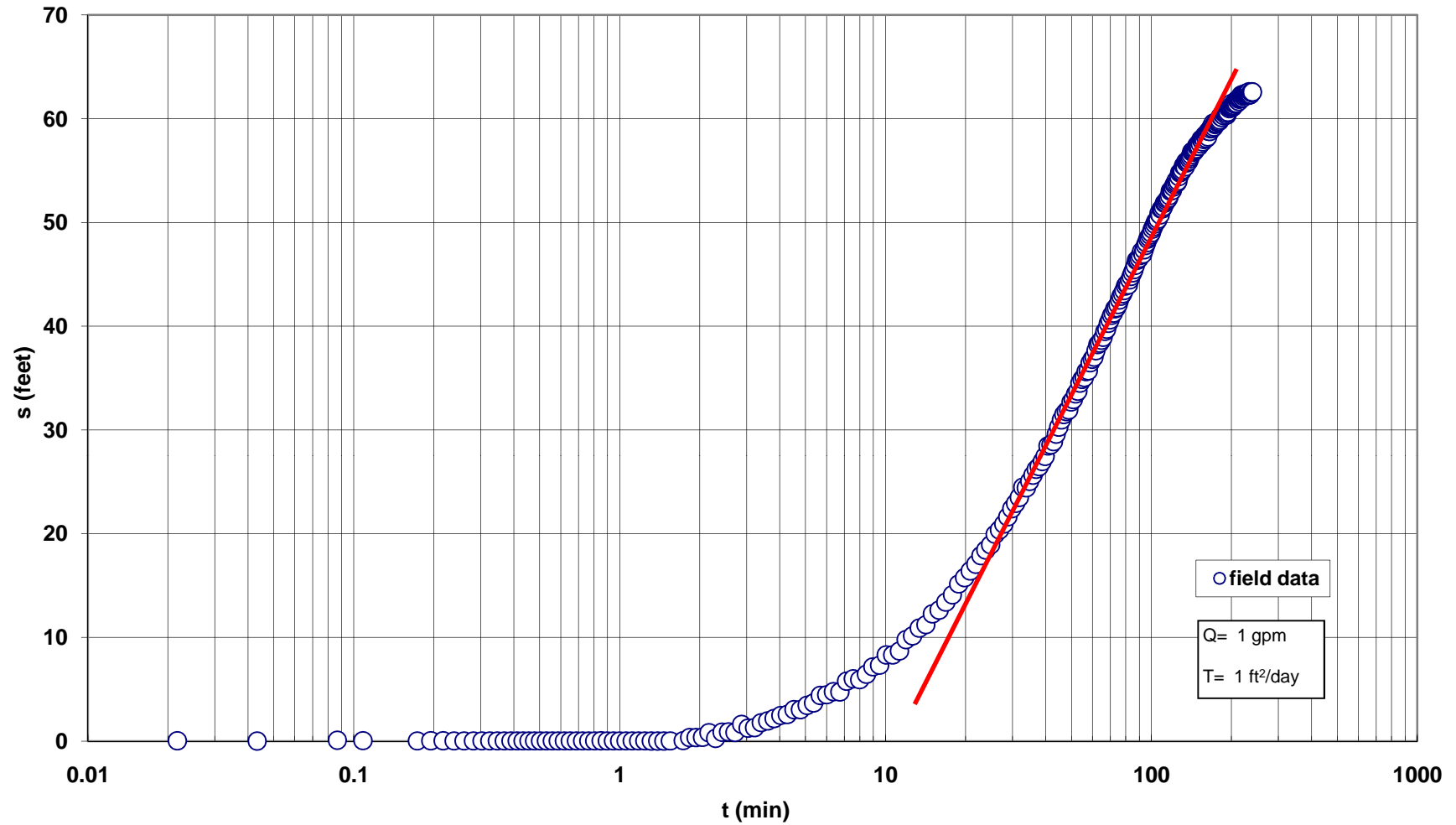
City of Hialeah
IW-2 Packer Test No. 3 (2,724-2,741.5 feet bpl)
02/09/10-02/10/10



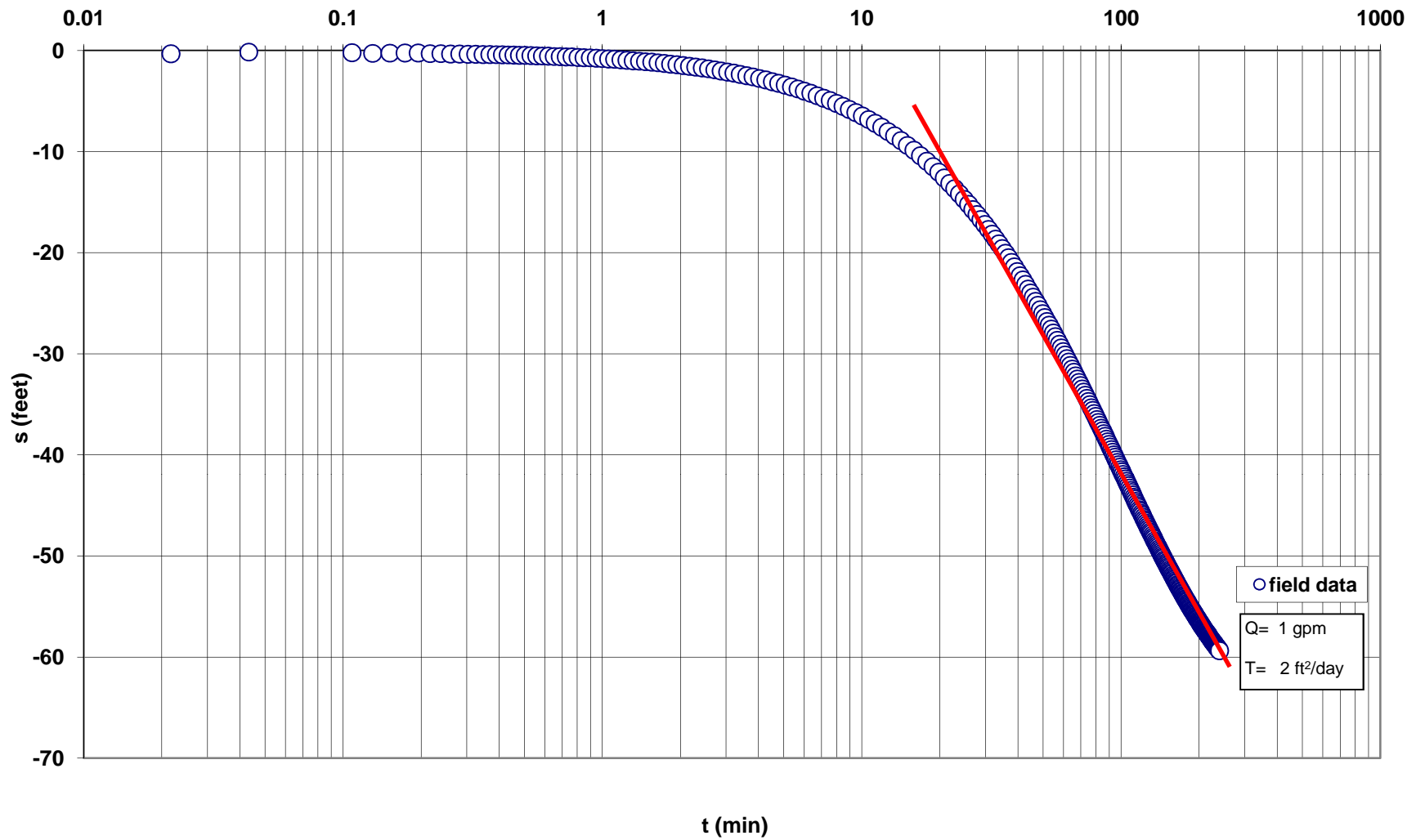
City of Hialeah
IW-2 Packer Test No. 3 (2,724-2,741.5 feet bpl)
02/09/10-02/10/10



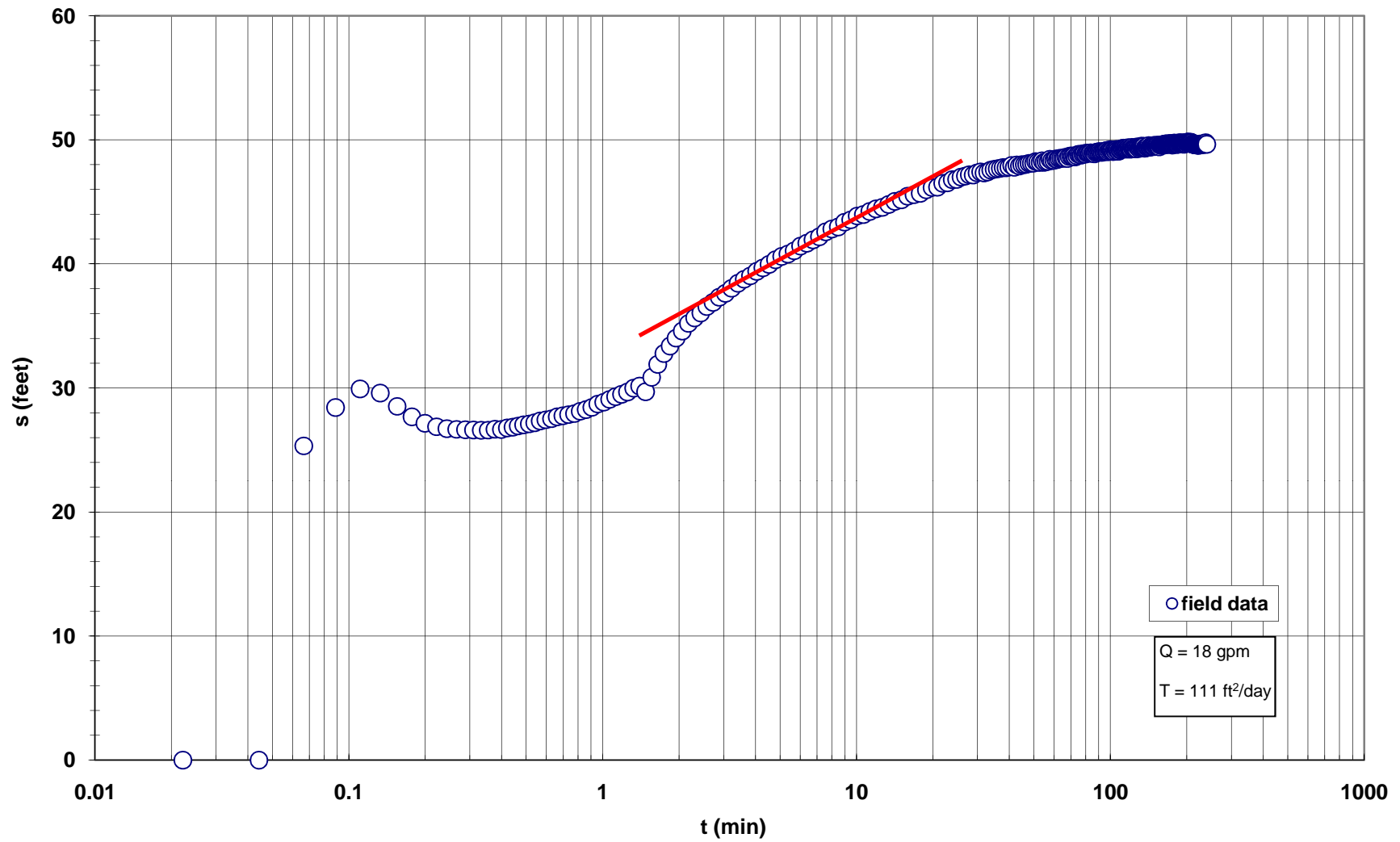
City of Hialeah
IW-2 Packer Test No. 4 (2,259-2,277 feet bpl)
02/11/10



City of Hialeah
IW-2 Packer Test No. 4 (2,259-2,277 feet bpl)
02/11/10

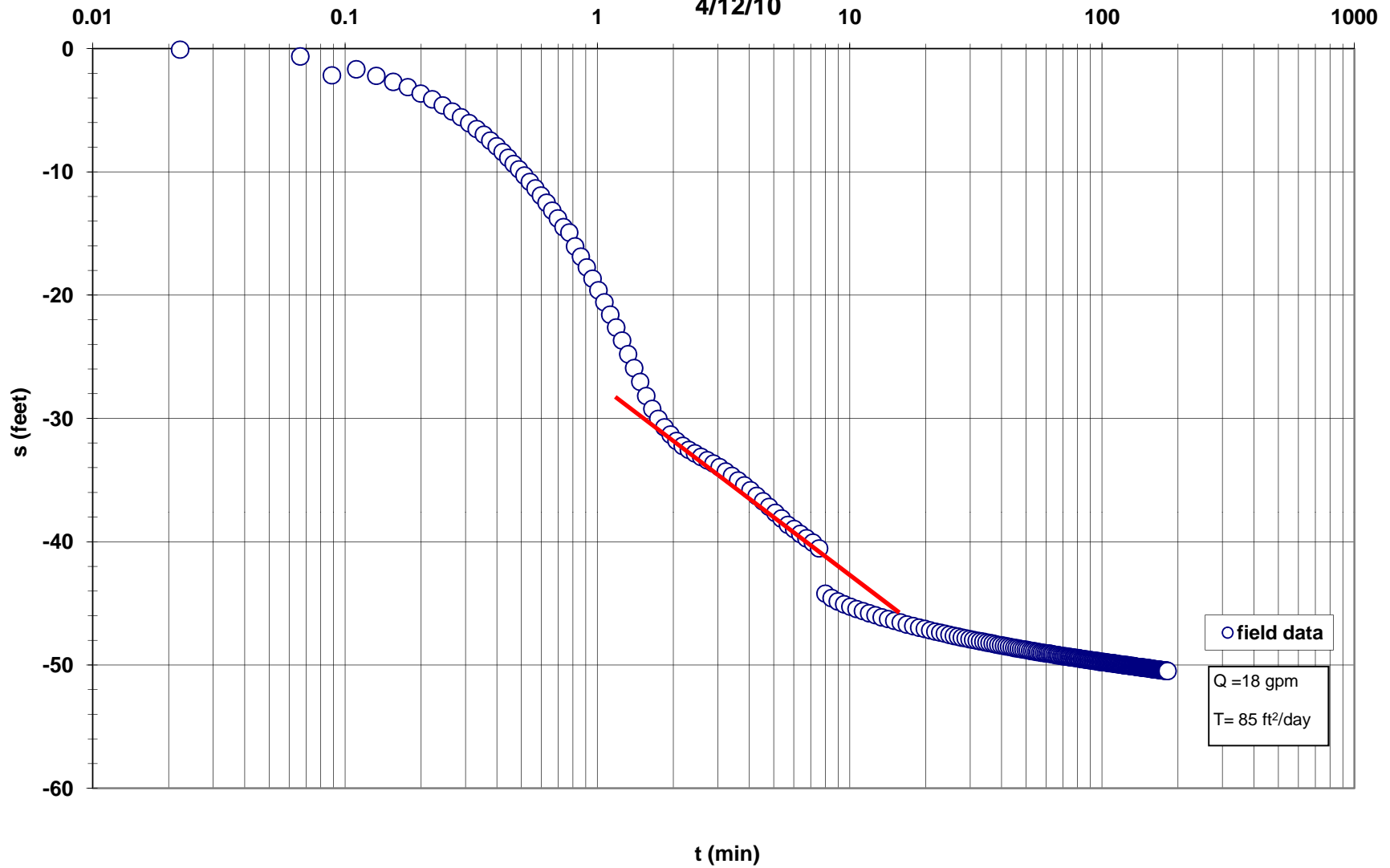


City of Hialeah
DZMW-1 Packer Test No. 1 (1,900-1,940 feet bpl)
4/12/10

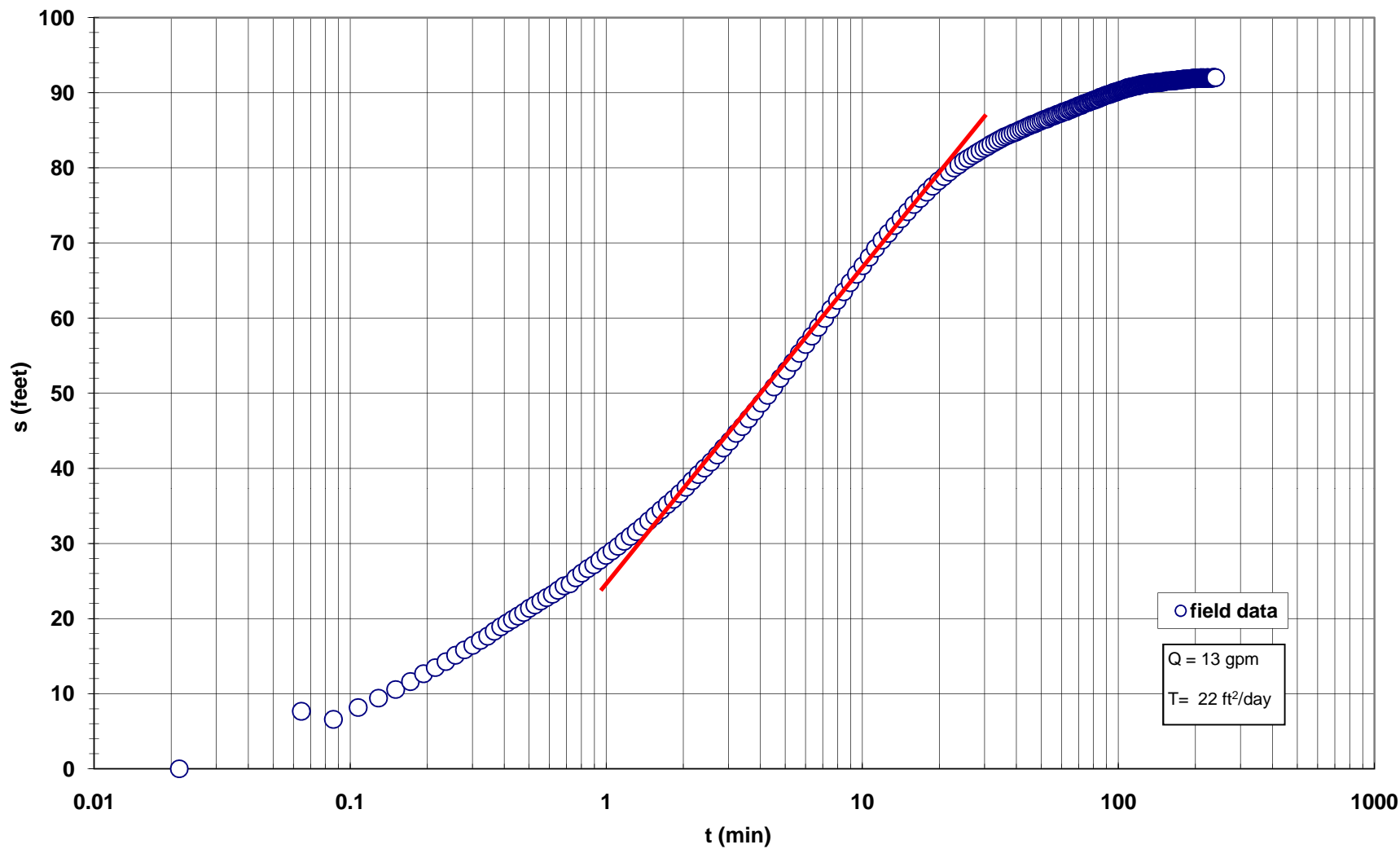


City of Hialeah
DZMW-1 Packer Test No. 1 (1,900-1,940 feet bpl)

4/12/10

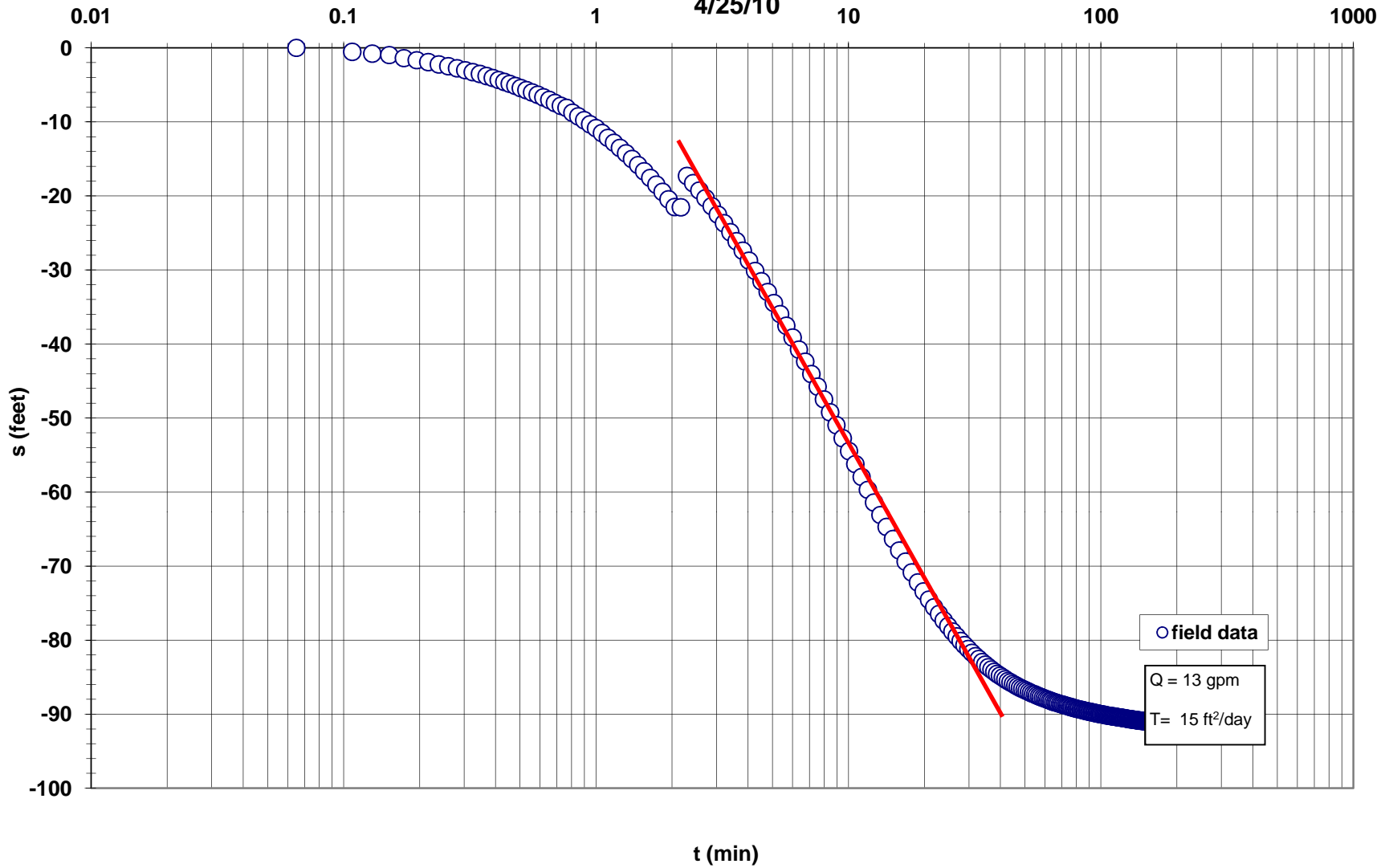


City of Hialeah
DZMW-1 Packer Test No. 2 (2,210 - 2,260 feet bpl)
4/25/10



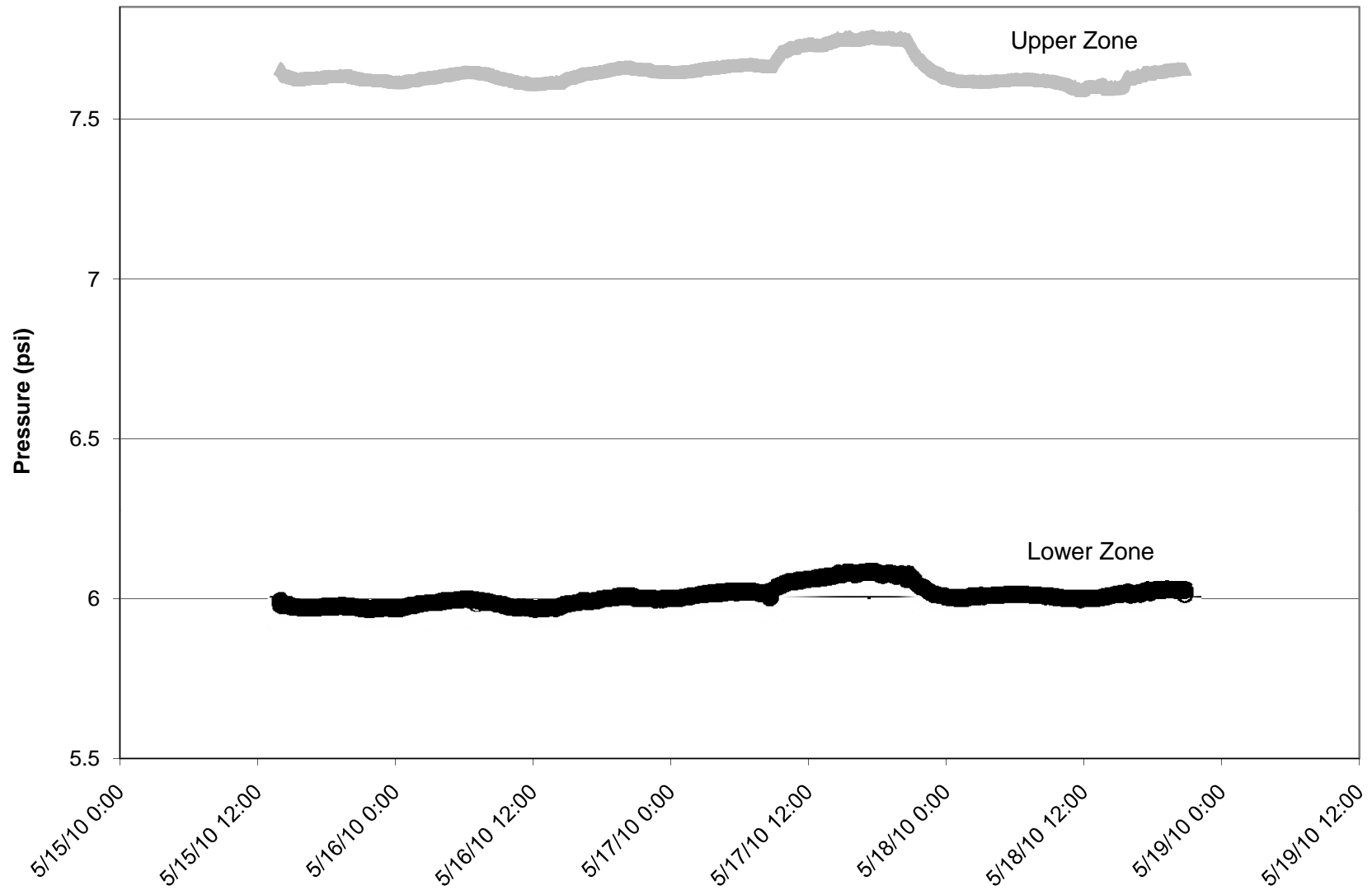
City of Hialeah
DZMW-1 Packer Test No. 2 (2,210-2,260 feet bpl)

4/25/10

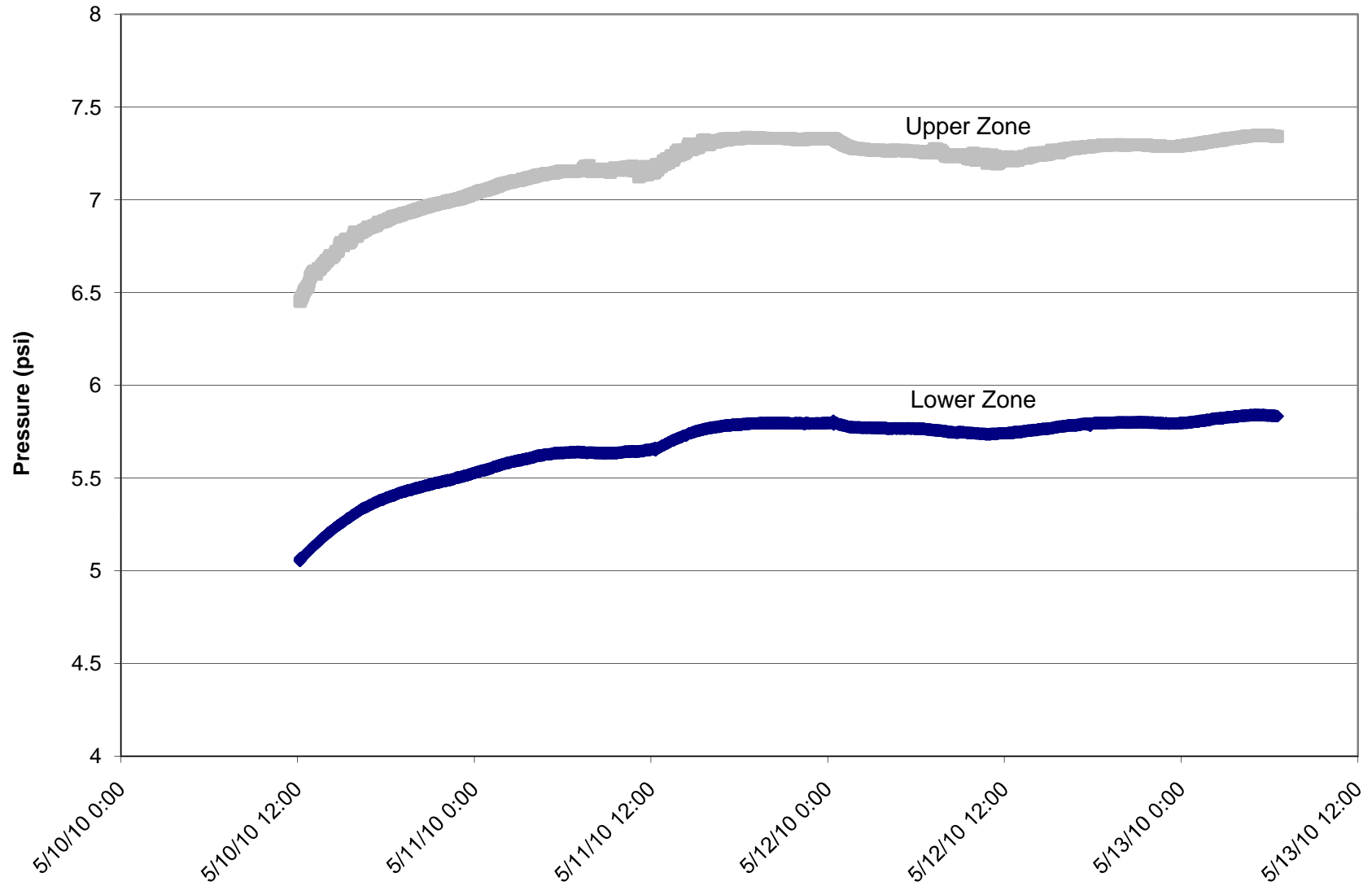


Appendix S

Pressure in Lower and Upper Zones of DZMW-1
during Injection Test of IW-1



Pressure in Lower and Upper Zones of DZMW-1
during Injection Test of IW-2



Pressure at IW-1 wellhead during Injection Test of IW-1

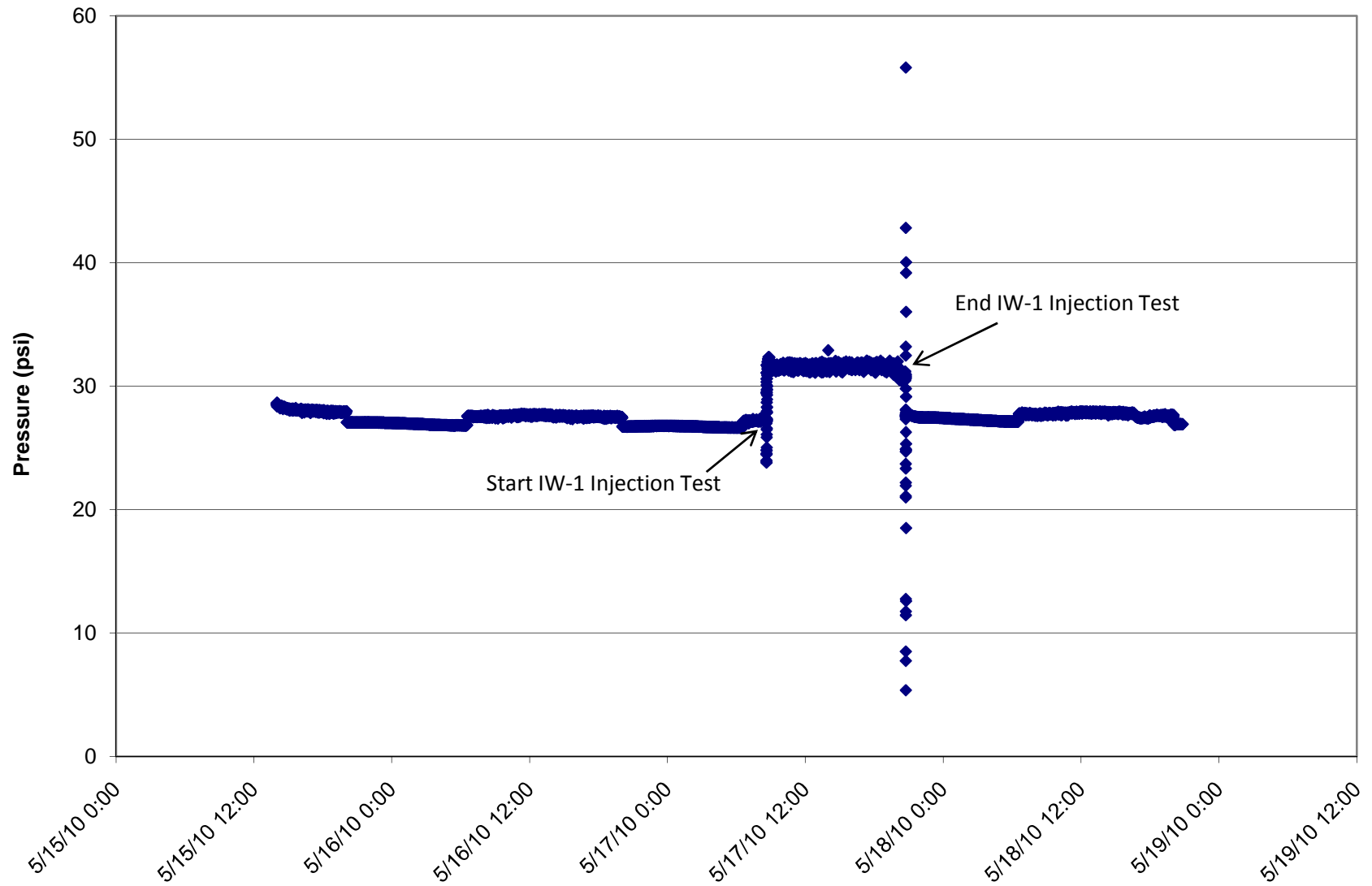
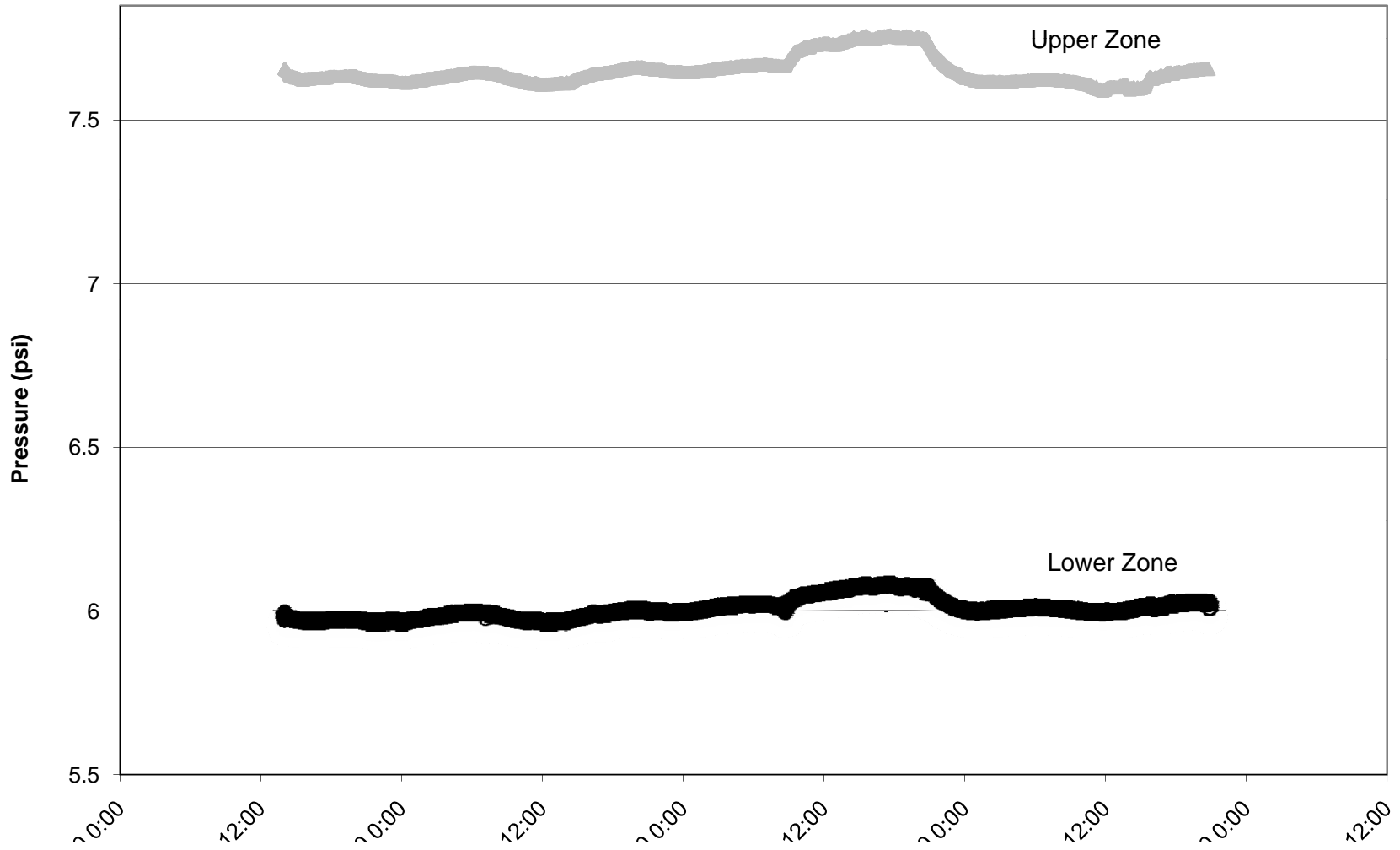
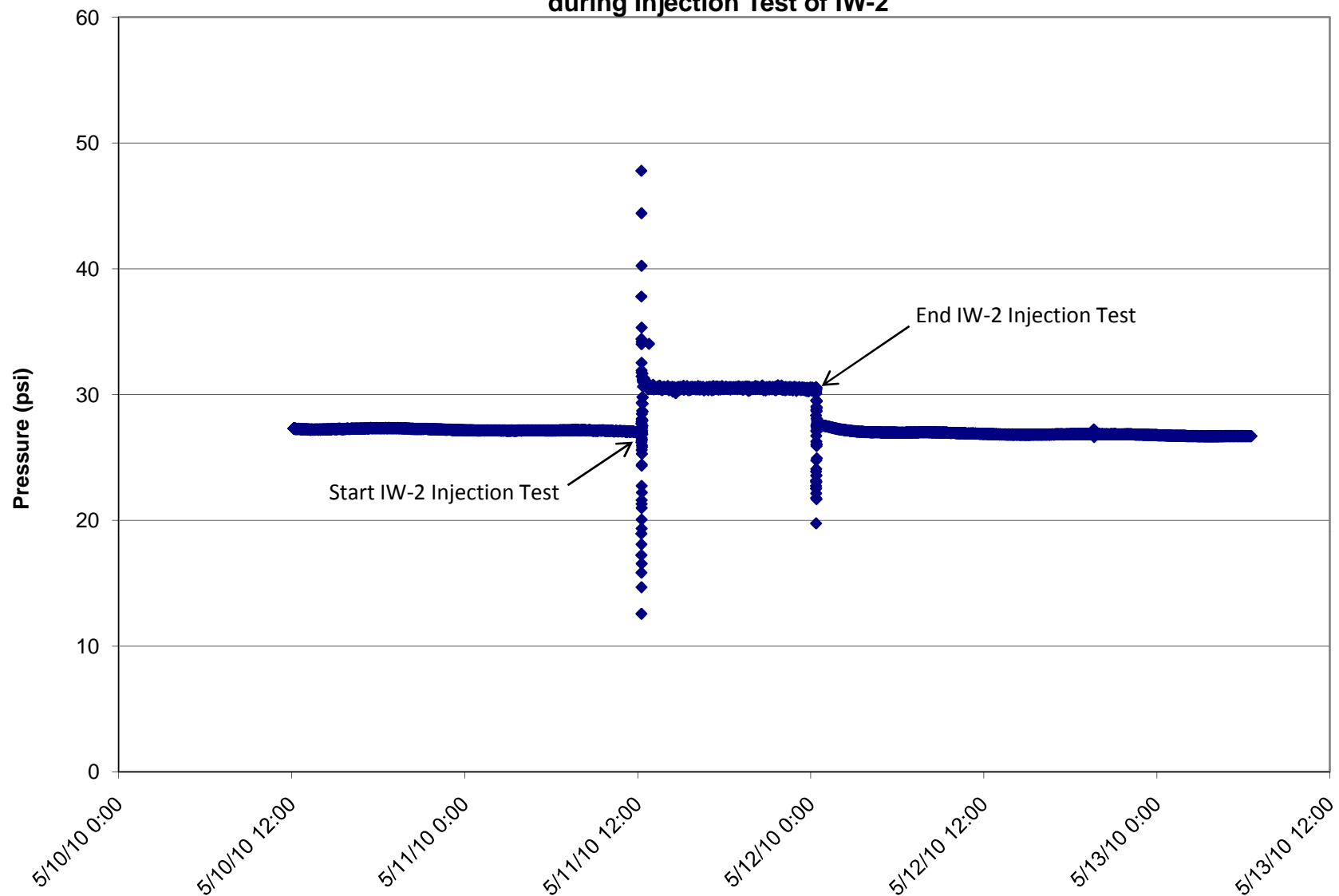


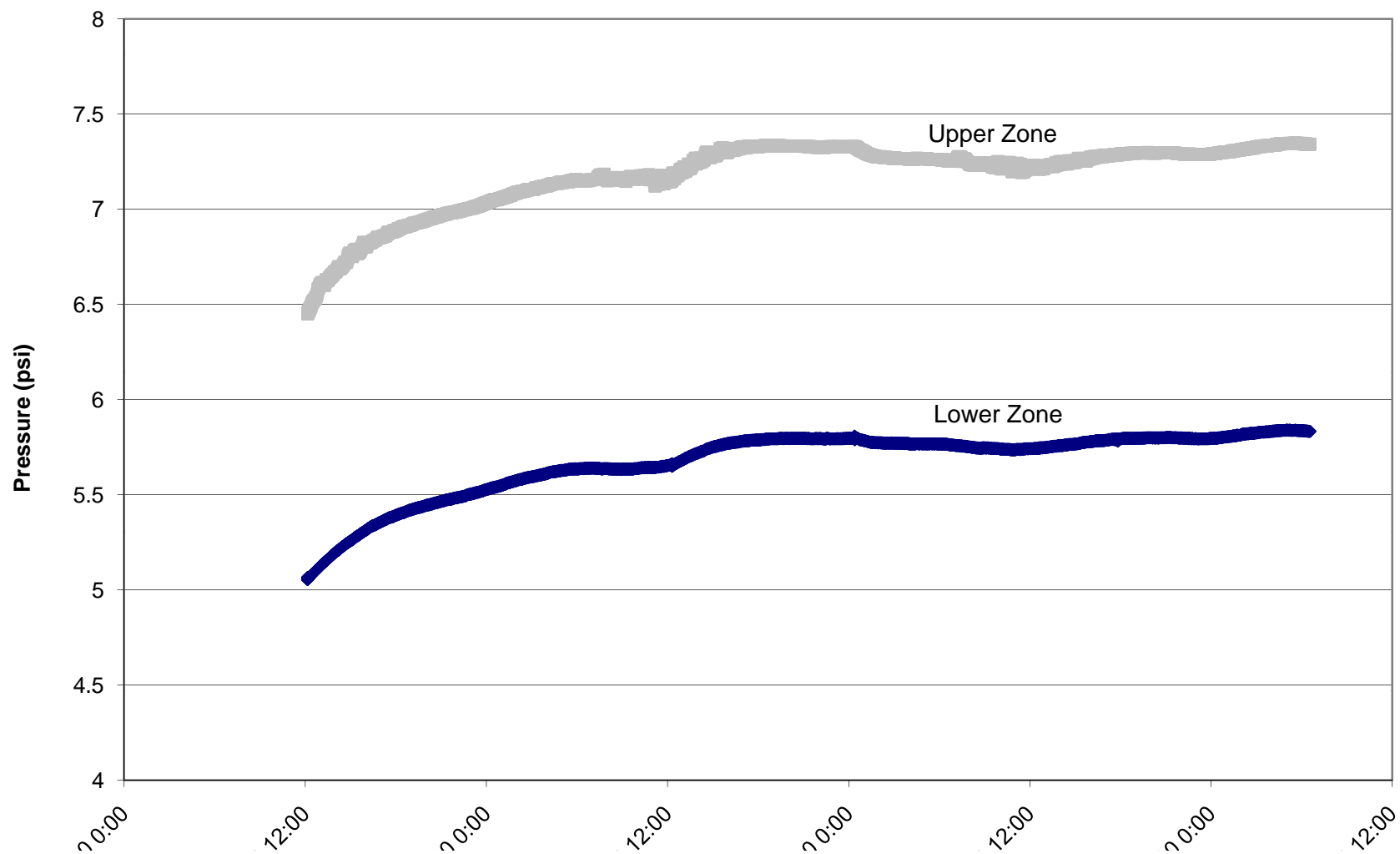
Figure 10 is a line graph showing the variation of water level (m) versus time (h) for the Upper and Lower Zones. The x-axis represents time in hours, with labels every 12:00. The y-axis represents water level in meters, ranging from 5.5 to 7.5. The Upper Zone (grey line) fluctuates between approximately 7.55m and 7.85m. The Lower Zone (black line) fluctuates between approximately 5.95m and 6.15m. Both zones show a similar trend with a slight increase in the middle of the period.



Pressure at IW-2 Wellhead
during Injection Test of IW-2



Pressure in Lower and Upper Zones of DZMW-1
during Injection Test of IW-2





CERTIFIED TEST REPORT

CUSTOMER: YOUNGQUIST BROTHERS
MODEL NO: ML03-12
METER SERIAL NO: 962070

CONFIGURATION

METER INSIDE DIAMETER: 12.2
DIAL: GAL X 1000 256/1
GEARS: 38 / 23
ACTUAL METER INDEX: 0.8628
TEST DATE: 4/22/2010
TEST FACILITY: Volumetric

As Calibrated

CALIBRATION DATA

	FLOW RATE GPM	% ACCURACY
1	3015.50	100.61
2	2567.00	100.17
3	297.71	98.71

CERTIFIED BY: Paul Hobbs DATE: 4/22/2010

This calibration was performed on a gravimetric or volumetric test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Gravimetric +/- 0.15% Volumetric +/- 0.5%



McCROMETER

3255 WEST STETSON AVENUE
HEMET, CA 92545 USA

PHONE (951) 652-6811 / FAX (951) 652-3078

WEB SITE: <http://www.mccrometer.com> E-MAIL: info@mccrometer.com



962070

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Version 1.0 (3/9/2007)

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 1

1W1

Purchase Order #

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-100

Serial Number: 10302

Customer I.D.:

Cust. Barcode: N/A

Cust. Location: N/A

Specifications: +/- 0.25% FS

Cal Date: 5/6/2010

Cal. Due Date: 11/6/2010

Cal. Interval 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR

Last Cal.

11/24/2009

Cal. Due Date

11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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Date of issue: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CONTROL NO: 15551

CUSTOMER: YBI15465

PH: 239-433-3400

FAX: 239-489-3877

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	10302	CAL. DATE:	5/6/2010
CUST. ID:	YBI	DUE DATE:	11/6/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE 0-100PSI				
NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5		4.8	5.2
10	9.95		9.8	10.2
25	25.02		24.8	25.2
50	50.04		49.8	50.2
75	74.877		74.8	75.2
100	99.875		99.8	100.2

Calibration Coefficients:

Linearity	0.1889
Scale	99.5374
Offset	0.2562

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Certificate of Calibration

OZONE
INDUSTRIES
CORPORATION
15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 2
1W-1

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-100

Serial Number: 10169
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order #**For:**

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 5/6/2010

Cal. Due Date: 11/6/2010

Cal. Interval 6 months

Received: OUT OF TOLERANCE / New Coeff.

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/ CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR	11/24/2009	11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CONTROL NO: 15465

CUSTOMER: YBI15465

PH : 239-433-3400

FAX: 239-489-3877

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	10169	CAL. DATE:	5/6/2010
CUST. ID:	YBI	DUE DATE:	11/6/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE 0-100PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	4.664	4.93	4.8	5.2
10	9.67	9.91	9.8	10.2
25	24.68	25.05	24.8	25.2
50	49.8	50.1	49.8	50.2
75	74.8	75.04	74.8	75.2
100	99.79	100.02	99.8	100.2

Calibration Coefficients:

Linearity	0.2417
Scale	102.0041
Offset	0.1532

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 1
1W2

Purchase Order #

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-100

Cal Date: 5/5/2010
Cal. Due Date: 11/5/2010
Cal. Interval 6 months
Received: IN TOLERANCE
Calibration Result: PASS
Environmental Conditions: 79 DEG F /95% H
Performed By: CODY WHITE

Serial Number: 5592
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR	11/24/2009	11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CONTROL NO: 3947142

CUSTOMER: YBI15465

PH : 239-433-3400

FAX: 239-489-3877

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	5592	CAL. DATE:	5/5/2010
CUST. ID:	YBI	DUE DATE:	11/5/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE 0-100PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5.13		4.8	5.2
10	10.16		9.8	10.2
25	25.14		24.8	25.2
50	49.98		49.8	50.2
75	74.97		74.8	75.2
100	100.02		99.8	100.2

Calibration Coefficients:

Linearity	0.3431
Scale	98.5703
Offset	-0.672

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 2
1W2

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-100

Serial Number: 8848
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 5/6/2010

Cal. Due Date: 11/6/2010

Cal. Interval: 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR

Last Cal.

11/24/2009

Cal. Due Date

11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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FORT MYERS, FL 33908

PH : 239-433-3400
FAX: 239-489-3877

CONTROL NO: 27-0443

CUSTOMER: YBI15465

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	8848	CAL. DATE:	5/6/2010
CUST. ID:	YBI	DUE DATE:	11/6/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE 0-100PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5.01		4.8	5.2
10	10.09		9.8	10.2
25	24.95		24.8	25.2
50	50.11		49.8	50.2
75	75.15		74.8	75.2
100	99.98		99.8	100.2

Calibration Coefficients:

Linearity	0.3602
Scale	99.499
Offset	0.0787

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Tel: 239-433-3400 - Fax: 239-489-3877

Date of issue: 5-6-10

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Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 1
DZMW Lower Zone

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-30 psi

Serial Number: 9243
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 5/6/2010

Cal. Due Date: 11/6/2010

Cal. Interval: 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc. Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR

Last Cal.

11/24/2009

Cal. Due Date

11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

PH: 239-433-3400
FAX: 239-489-3877

CONTROL NO:

CUSTOMER: YBI15465

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	9243	CAL. DATE:	5/6/2010
CUST. ID:	YBI	DUE DATE:	11/6/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE: 0-30 PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5.12		4.8	5.2
10	10.01		9.8	10.2
15	15.05		14.8	15.2
20	20.11		19.8	20.2
30	29.97		29.8	30.2

Calibration Coefficients:

Linearity	0.2695
Scale	29.6832
Offset	-0.2114

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 2
DZMW Lower Zone

Purchase Order #

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-30 psi

Serial Number: 10318

Customer I.D.:

Cust. Barcode: N/A

Cust. Location: N/A

Specifications: +/- 0.25% FS

Cal Date: 5/5/2010

Cal. Due Date: 11/5/2010

Cal. Interval 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR

Last Cal.
11/24/2009

Cal. Due Date
11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

PH: 239-433-3400
FAX: 239-489-3877

CONTROL NO: 239-433-3400

CUSTOMER: YBI15465

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	10318	CAL. DATE:	5/5/2010
CUST. ID:	YBI	DUE DATE:	11/5/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE: 0-30 PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5.18		4.8	5.2
10	10.17		9.8	10.2
15	14.99		14.8	15.2
20	20.02		19.8	20.2
30	29.99		29.8	30.2

Calibration Coefficients:

Linearity	0.2261
Scale	29.7787
Offset	0.3893

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 1
DZMW Upper Zone

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-30 psi

Serial Number: 10137
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 5/5/2010

Cal. Due Date: 11/5/2010

Cal. Interval 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/ CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR	11/24/2009	11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

PH: 239-433-3400
FAX: 239-489-3877

CONTROL NO: 211-211

CUSTOMER: YBI15465

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	10137	CAL. DATE:	5/5/2010
CUST. ID:	YBI	DUE DATE:	11/5/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE: 0-30 PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	4.97		4.8	5.2
10	9.99		9.8	10.2
15	15.01		14.8	15.2
20	20.11		19.8	20.2
30	30.1		29.8	30.2

Calibration Coefficients:

Linearity	0.2584
Scale	29.6223
Offset	-0.0802

Certificate of Calibration



15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

Ozone Industries, Inc.
Precision Measurement Equipment Division

Box 2
DZMW Upper Zone

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: TRANSDUCER
Manufacturer: In-Situ Inc.
Model Number: PXD-261
Part Number: N/A
Range: 0-30 psi

Serial Number: 10210
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order #

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 5/6/2010

Cal. Due Date: 11/6/2010

Cal. Interval 6 months

Received: IN TOLERANCE

Calibration Result: PASS

Environmental Conditions: 79 DEG F /95% H

Performed By: CODY WHITE

Procedure: STANDARD/COEFFICIENT

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION. PERFORMED ROUTINE CALIBRATION/
CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR	11/24/2009	11/24/2010

Signatures:

Certified by:

Print: CODY WHITE

Date: 5-6-10

Approved by:

Print: CODY WHITE

Date: 5-6-10

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Tel: 239-433-3400 - Fax: 239-489-3877

Date of issue: 5-6-10

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

PH: 239-433-3400
FAX: 239-489-3877

CONTROL NO: 202100000

CUSTOMER: YBI15465

CALIBRATION DATA FORM

MFR:	In-Situ	DESCRIPTION	Transducer
MODEL NO:	PXD-261	TECHNICIAN:	0030
SERIAL NO:	10210	CAL. DATE:	5/6/2010
CUST. ID:	YBI	DUE DATE:	11/6/2010

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE: 0-30 PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
5	5.19		4.8	5.2
10	10.12		9.8	10.2
15	15.01		14.8	15.2
20	20.02		19.8	20.2
30	30.1		29.8	30.2

Calibration Coefficients:

Linearity	0.256
Scale	30.2511
Offset	0.399

Appendix T

Certificate of Calibration



Ozone Industries, Inc.
Precision Measurement Equipment Division

Calibration Performed By:

OZONE INDUSTRIES, INC.
15551 PINE RIDGE RD.
FORT MYERS, FL 33908

EQUIPMENT INFORMATION:

Description: PRESSURE GAUGE
Manufacturer: MCDANIELS
Model Number: 300PSI
Part Number: N/A
Range: 0-300 PSI

Serial Number: 052206-1
Customer I.D.:
Cust. Barcode: N/A
Cust. Location: N/A
Specifications: +/- 0.25% FS

Purchase Order

For:

YOUNGQUIST BROTHERS, INC.
15465 PINE RIDGE RD.
FORT MYERS, FL 33908

Cal Date: 3/5/2010
Cal. Due Date: 6/5/2010
Cal. Interval 3 MONTHS
Received: IN TOLERANCE
Calibration Result: PASS
Environmental Conditions: 65 DEG F / 20% H
Performed By: CODY WHITE

Procedure: STANDARD

This is to certify that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure at the points tested (unless otherwise noted). It has been Calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration is in accordance with Ozone Industries, Inc Quality Assurance Manual. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired.

Calibration Remarks:

THIS UNIT WAS FOUND TO BE IN TOLERANCE AT THE TIME OF CALIBRATION.
PERFORMED ROUTINE CALIBRATION / CERTIFICATION

Standards Used to Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
OZONE	A1731	EATON UPC5000 PNEUMATIC CALIBRATOR	11/24/2009	11/24/2010

Signatures:

Certified by:

Print: Cody White
Date: 03/05/10

Approved by:

Print: Cody White
Date: 03/05/10

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Date of issue: 03/05/2010

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15465 PINE RIDGE ROAD
FORT MYERS, FL 33908

CONTROL NO: 100809-7

CUSTOMER: YBI15465

PH: 239-433-3400

FAX: 239-489-3877

CALIBRATION DATA FORM

MFR:	UNKNOWN	DESCRIPTION	PRESSURE GAUGE
MODEL NO:	300 PSI .25%	TECHNICIAN:	0030
SERIAL NO:	052206-1	CAL. DATE:	03/05/10
CUST. ID:	N/A	DUE DATE:	06/05/10

* IF NO "AS LEFT" READING IS SHOWN ON THIS CHART, IT MEANS THE UNIT WAS IN TOLERANCE AND THERE WERE NO ADJUSTMENTS MADE TO IT.

RANGE: 0-300 PSI

NOMINAL	AS FOUND	AS LEFT *	LOW LIMIT	HIGH LIMIT
50	49.4		49.25	50.75
100	99.5		99.25	100.75
150	149.6		149.25	150.75
200	199.5		199.25	200.75
300	299.6		299.25	300.75

ANNULAR PRESSURE TEST RESULTS

WELL: IW-1

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: May 13, 2010

INJECTION CASING SIZE: 24 INCH

RECORDED BY: David Barnes

INJECTION TUBING SIZE: 16 INCH

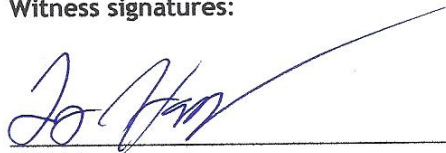
WITNESSED BY: Gardner Strasser (FDEP)


YBI PACKER DEPTH: 2933 ft bpl

Les Haney YBI

TIME (HOURS)	ELAPSED TIME (MINUTES)	CASING PRESSURE (PSI)	PRESSURE CHANGE (PSI)
0900	0	160.0	0
0905	5	160.0	0
0910	10	160.0	0
0915	15	160.0	0
0920	20	160.0	0
0925	25	160.0	0
0930	30	160.0	0
0935	35	160.0	0
0940	40	160.0	0
0945	45	160.0	0
0950	50	160.0	0
0955	55	160.0	0
1000	60	160.0	0
Total Bleed-off volume: 53 gals		Net change	0.0

Witness signatures:



 05.13.2010



ANNULAR PRESSURE TEST RESULTS

WELL: IW-2

PROJECT NO.: 0044-0122

PAGE: 1 of 1

SITE LOCATION: Hialeah RO

PERMIT NO.: 0289249-001-UC

DATE: May 5, 2010

INJECTION CASING SIZE: 24 INCH

RECORDED BY: Joseph Abbott

INJECTION TUBING SIZE: 16 INCH

WITNESSED BY: Gardner Strasser

YBI PACKER DEPTH: 2933 ft bpl

TIME (HOURS)	ELAPSED TIME (MINUTES)	CASING PRESSURE (PSI)	PRESSURE CHANGE (PSI)
0910	0	159	0
0920	10	159	0
0930	20	159	0
0945	35	159	0
0950	40	159	0
0955	45	159	0
1000	50	159	0
1005	55	159	0
1010	60	159	0

Witness signatures:

Gardner Strasser 05.05.2010

* 60 gallons were drained from casing annulus while depressurizing to zero psi.

[Signature]

Chris Huf