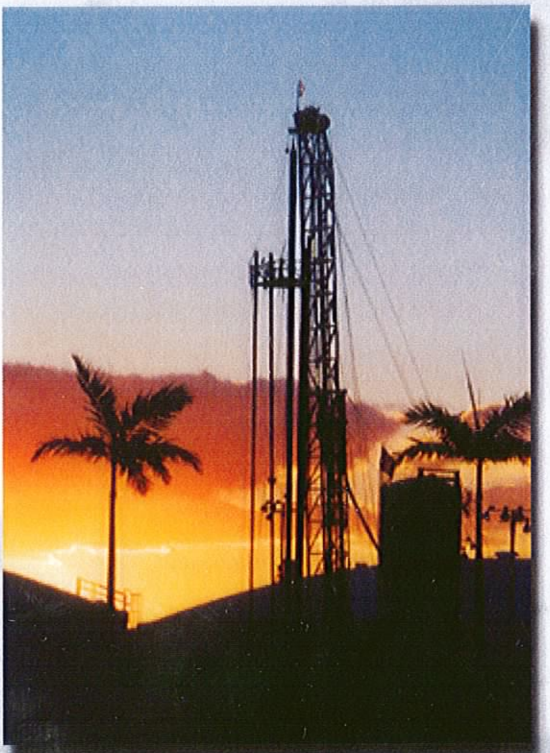
City of
Pompano Beach

Engineering Well Completion Report
Concentrate Disposal System

Prepared for:
City of Pompano Beach
City Project No. 99-747
Bid No. K-17-01



Prepared by:
Hazen and Sawyer, P.C.
In association with
Water Technology Associates, Inc.
Project No. 40368

May 2002

IW= G-2942

MW = POMP_CMW1

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HAZEN AND SAWYER
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May 31, 2002

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Groundwater Section – U. I. C. Permitting
400 North Congress Avenue
West Palm Beach, FL 33401

City of Pompano Beach
UIC Class I Injection Well
Permit Number 0167214-001-UC
Engineering Well Completion Report

Dear Mr. May:

In fulfillment of the above-reference permit and Florida Administrative Code 62-528, Hazen and Sawyer is pleased to submit the attached Well Completion Report on behalf of the City of Pompano Beach. The concentrate disposal well and monitor well are both located at the City of Pompano Beach Water Treatment Plant. This report presents the results of the construction and testing performed during the drilling of the concentrate disposal well and the associated monitor well.

As always, please feel free to call should you have any questions.

> 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.

5-31-02

Albert Muniz
Albert Muniz, P.E.
No. 35587

William F. Flaherty
William F. Flaherty
Utility Director

Very truly yours,

HAZEN AND SAWYER, P.C.

Albert Muniz

Albert Muniz, P.E.
Project Manager

c: *See distribution list*

H&S – 40174 / 40368

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Table of Contents

Chapter 1.0 - Injection Well Program

Chapter 2.0 - Well Drilling and Construction

Chapter 3.0 - Subsurface Conditions

Chapter 4.0 - Final Testing

Chapter 5.0 - Findings and Recommendations

Tables

Figures

Appendices

1.0 Injection Well Program

1.1 Introduction

On March 22, 2001, the City of Pompano Beach was issued Permit No. 0167214-001-UC by the Florida Department of Environmental Protection (FDEP) for the construction of one 16-inch diameter Class-1 injection well (IW-1) and associated dual-zone deep monitor well (MW-1). A copy of the permit is included in Appendix A. The wells are located at the City of Pompano Beach Water Treatment Plant (WTP). A location map of the project site is presented in Figure 1.

The wells were constructed in accordance with contract documents prepared by Hazen and Sawyer (H&S) entitled Contract Documents for the Construction of the Concentrate Disposal Well, dated September 13, 2000. These plans and specifications for drilling one injection well and one dual-zone monitor well formed the basis of a contract between the City of Pompano Beach and Youngquist Brothers, Inc. (referred to hereinafter as "the Contractor").

H&S was retained by the City of Pompano Beach (City) to provide construction management services for the project. H&S utilized the services of Water Technologies Associates, Inc. (WTA) to provide partial field observation and hydrogeologic services. The H&S and WTA team is hereinafter referred to as "the Engineer". On-site supervision was provided by the Engineer during testing, geophysical logging, casing installation, and cementing operations. Construction phase responsibilities of the Engineer included obtaining FDEP approval on key elements of the project and reporting project progress weekly to the Technical Advisory Committee (TAC), which included members from the FDEP, the Broward County Department of Planning and Environmental Protection (BCDPEP), the South Florida Water Management District (SFWMD) and the United States Geological Society (USGS). The United States Environmental Projection Agency (EPA) is copied on TAC correspondence, but is not a member of the TAC.

1.2 Purpose

The purpose of this report is to summarize the information obtained during the construction and testing of IW-1 and MW-1. The following information is included in this report:

- Description of methods used to analyze the data
- Documentation of the approved casing setting depths and monitoring zones for MW-1
- Demonstration of mechanical integrity of the injection well
- Identification of confinement above the injection zone

- Verification that the well is suitable for the designed pumping rates to allow long term operational testing of the injection well.

1.3 Elements of the Injection Well Contract

The project specifications contained provisions for the construction and testing of the one injection well and the associated monitor well. The well design was based on the data obtained from other wells in the area. The 16-inch diameter injection well was constructed to approximately 3,000 feet below land surface. The deep dual-zone monitor well (also called the monitor well) was constructed to a total depth of 1,950 feet.

Provisions of the contract included:

- Monitoring depth, weight on bit, rate of penetration, inclination and drilling fluid during the drilling of the wells;
- Collecting and logging geologic cuttings (samples), to confirm lithologic boundaries and gross lithologic properties;
- Collecting and analyzing conventional cores to complement the geologic logging and to identify hydrologic properties of the lithologic formations;
- Conducting the following geophysical logs at various points during the well construction: X-Y caliper, gamma ray, fluid conductivity, dual induction, borehole compensated sonic/VDL, fluid resistivity, temperature, flowmeter and borehole televiewer;
- Conducting open hole video (television) survey;
- Conducting straddle packer and single packer tests in discrete zones of the injection well pilot hole to determine the hydrologic properties of lithologic units;
- Collecting and analyzing of water samples taken during the packer tests to determine water quality variations with depth;
- Conducting casing cement top temperature logs and cement bond logs on various casing strings during the cementing operations;
- Collecting and analyzing background water samples from the monitoring zones and the injection zones;

- Conducting a hydrostatic pressure test, video survey and radioactive tracer survey on the final casing string to determine mechanical integrity of the injection well; and
- Conducting a short-term injection test in the completed injection well to demonstrate the ability of the injection well system to accept concentrate at the design flow rate.

2.0 Well Drilling and Construction

2.1 Well Construction

The injection well was constructed prior to the construction of the dual-zone monitor well (i.e., IW–1 constructed prior to MW-1). The monitor well was constructed approximately 70 feet northwest of IW-1. Well locations are presented in Figure 2. During the drilling of the wells, geophysical logging and testing were performed. Well construction was in accordance with the FDEP construction permit. Refer to Appendix A for a copy of the permit.

The drilling of IW-1 and MW-1 proceeded generally as identified in the project specifications with modifications approved by FDEP. The project specifications identified an outline of a drilling plan with the intention of making modifications to the plan as site specific conditions warranted. The plan included setting steel casing at selected depths to maintain the formation during drilling and to facilitate the proposed testing.

To consistently record downhole depth, all well measurements are recorded in terms of depth below pad level (bpl). Actual depths of casings are identified in the profile of the completed well IW-1 and MW-1 presented in Figures 3 and 4, respectively. The injection well was constructed as generally follows:

- Drill a nominal 58-inch diameter borehole to approximately 125 feet bpl using the mud rotary method.
- Set and cement 50-inch diameter steel casing to a depth of 121 feet bpl.
- Drill a nominal 50-inch diameter borehole to approximately 1,030 feet bpl using the mud rotary method.
- Set and cement 42-inch diameter steel casing to a depth of 1,020 feet bpl.
- Drill a nominal 12¼-inch diameter pilot hole to approximately 2,030 feet bpl using the reverse air method and core at depths selected by the Engineer.
- Backplug pilot hole with cement.
- Drill a nominal 42-inch diameter borehole to approximately 1,955 feet bpl using the reverse air method.
- Set and cement 34-inch diameter steel casing to a depth of 1,950 feet bpl

- Drill a nominal 12¼-inch diameter pilot hole to approximately 3,000 feet bpl using the reverse air method and core at depths selected by the Engineer.
- Set cement plug at 2,525 feet bpl and back plug pilot hole with cement.
- Drill a nominal 34-inch diameter pilot hole to approximately 2,925 feet bpl using the reverse air method.
- Abandon lost nominal 34–inch diameter bottom hole assembly and 12¼–inch diameter bit. Top of bottom hole assembly located at 2,901 feet bpl.
- Set and cement 24-inch diameter steel casing to a depth of 2,293 feet bpl.
- Set and cement a 16-inch diameter steel tubing and packer assembly at 2,273 feet bpl.

The drilling of MW-1 proceeded generally as identified in the project specifications. The depth of the monitor zones was based on the data collected during the drilling and testing of IW-1. The selection of the monitor zone depths is discussed later in the report. MW-1 was generally constructed as follows:

- Drill a nominal 32-inch diameter borehole to approximately 165 feet bpl using the mud rotary method.
- Set and cement in place 24-inch diameter steel casing at 160 feet bpl.
- Drill a nominal 24-inch diameter borehole to approximately 1,525 feet bpl using the mud rotary method.
- Set and cement in place 16-inch diameter steel casing at 1,520 feet bpl.
- Drill a nominal 16-inch diameter borehole to approximately 1,950 feet bpl using the reverse air method.
- Set and cement in place 6⅝-inch diameter steel casing at 1,900 feet bpl using cement baskets, filling the annular space of the final casing with cement from 1,900 to 1,550 feet bpl.

The upper monitor zone (UMZ) was established between 1,520 and 1,550 feet bpl and the lower monitor zone (LMZ) between 1,900 and 1,950 feet bpl. The upper outside 1,600 feet of the 6⅝-inch diameter casing was coated with a corrosion resistant epoxy-phenolic compound. An as-built profile of the completed MW-1 is presented in Figure 4.

Pilot hole drilling at the Pompano Beach injection well site posed some construction challenges due to the fractured nature of the Boulder Zone and the cave–ins that occurred. For example, after completing the 12¼–inch diameter pilot hole to a depth of 3,000 feet bpl geophysical logging was commenced. During the X–Y caliper/gamma ray logging on August 23, 2001 the geophysical logging tool became stuck at approximately 2,580 feet bpl, the depth where caverns were first encountered. The logging tool was successfully recovered on August 24, 2001, but on August 25, 2001, the flowmeter tool became stuck at a depth of approximately 2,620 feet bpl. The contractor was unable to retrieve the tool and a portion of the fishing tool was also lost during a recovery attempt. The flowmeter tool and fishing tool were both drilled out while reaming IW–1 to a nominal 34–inches in diameter.

In addition to the above, other challenges were presented while completing the well. In accordance with FDEP's request to set the 24–inch diameter casing at a depth of 2,920 feet bpl, the contractor began reaming the borehole to a nominal diameter of 34–inches. Due to the fractured and unstable nature of the formations encountered construction was slow with reaming and dredging operations continuing for a period of 29 working days. Reaming of the nominal 34–inch diameter continued until the bit was lost at a depth of approximately 2,714 feet bpl. Fishing operations enabled the contractor to recover and extract the bit from the borehole. A new nominal 34–inch diameter bottom hole assembly (BHA) was then constructed and the contractor resumed reaming operations.

The borehole was then reamed to a depth of 2,925 feet bpl. The contractor noticed resistance while tripping out the nominal 34–inch diameter bit. This resistance was likely the result of sloughing material in the upper portion of the borehole. While attempting to pull the drill string free the drill pipe parted from the bottom hole assembly at a depth of 2,730 feet bpl. The BHA dropped back to the bottom of the borehole (2,925 feet bpl) placing the top of the stabilizer at approximately 2,901 feet bpl. Unstable hole conditions necessitated that the borehole be re–reamed and dredged for approximately 23 working days before recovery operations could be initiated. A 12¼–inch diameter bit was tripped in to clean fallen material from the top of and alongside the BHA. Upon removing the drill pipe from the borehole it was discovered that the 12¼–inch bit, bit subs and approximately 13 feet of drill pipe had been lost in the borehole. The total length of the lost 12¼–inch assembly was approximately 18 feet. The top of the assembly was located at 2,890 feet bpl. After several unsuccessful attempts to recover them, the lost nominal 34–inch BHA and 12¼–inch bit were abandoned in place.

In accordance with FDEP's request the 24–inch diameter casing was to be set at a depth of 2,920 feet bpl. As described above, extensive time was required to stabilize the borehole to this depth. A review of drilling operations, the video survey and geophysical logs revealed that the formations from approximately 2,580 feet bpl to the total depth of the borehole were highly fractured. In addition the reamed borehole diameter between 2,300 and 2,580 feet bpl was generally greater than 70 inches with few ledges approaching the nominal bit diameter of 34 inches. These types of conditions are not amenable for obtaining a proper casing seat seal or casing cement bond. Thus a request to set the 24–inch diameter casing to 2293 feet bpl was made to and approved by FDEP. At 2,300 feet bpl the borehole diameter was approximately equal to the bit diameter, offering a suitable location for the installation of a bridge plug. After the bridge plug was installed, the 24–inch casing was successfully cemented in place. The cement bond log confirmed the cement seal. The 24–inch diameter casing was set to a depth of 2,293 feet bpl.

2.2 Data Collection

Data was collected during the construction of the wells using various methods and procedures as described in this Section. Independent testing and laboratory analyses performed by subcontractors of Youngquist Brothers, Inc. included the following: geophysical logging was performed by Florida Geophysical Logging, Inc., water quality analyses were performed by Sanders and Severn Trent Laboratories, and testing of rock cores was performed by Ardaman & Associates, Inc. and Core Labs.

Except as noted, measurements of footage in the wells are referenced to the pad level. The National Geologic Vertical Datum (NGVD) elevation of IW-1 and MW-1 are 19.67 and 19.67 feet, respectively. As-built elevations are shown on Figure 2 (see Appendix P for well head elevations and site survey).

Daily progress and activities were monitored and recorded. The Engineer prepared daily progress reports during well construction. The Contractor prepared independent daily reports. In addition to recording daily drilling progress, the reports included other pertinent drilling information such as drilling speed, weight on the drill bit, penetration rates, and relative hardness of the formations. Problems encountered during drilling were observed and noted. All activities related to the installation of well casings, cementing or other materials, as well as their quantities, were recorded. Detailed descriptions of test procedures and data collection, including results of inclination surveys to verify hole straightness, were recorded. The length and configuration of tools introduced into the borehole were noted. Copies of the daily and weekly progress reports were transmitted to the TAC members on a weekly basis. Graphs of the drilling weight on bit (WOB) and rate of penetration (ROP) are presented in Appendix B.

An inclination survey was conducted every 90 feet in the pilot and reamed holes to confirm plumbness requirements for the wells. The results from the inclination surveys are presented in Appendix C.

2.3 Geologic Samples

Samples of drilled cuttings were collected and analyzed from the drilling of the injection well and monitor well pilot holes. Circulation time (the time required for drilled cuttings to reach the surface) was calculated regularly to ensure that accurate sample depths were recorded. After initial examination, the Engineer's on-site personnel described the samples. A geologic description of each sample was entered into a log. The cuttings from the confining interval were classified in accordance with the scheme of Dunham (1962). These logs are presented in Appendix D. Two sets of drill cuttings were bagged in 10-foot intervals. After the wells were completed, the Contractor sent one set of these samples to the Florida Bureau of Geology in Tallahassee, Florida.

2.4 Cores

During the drilling of the injection well pilot hole, conventional core samples were collected. These samples were reviewed and select samples were sent to an independent laboratory for analysis. The results of the analyses are used to demonstrate confinement. Core depths were selected by the Engineer primarily on the basis of reviewing and interpreting information from other nearby wells, information obtained during the drilling of the injection well including weight on bit, rate of penetration, and lithology. The Contractor used 4-inch inside diameter core barrels for this project. Each core was approximately ten feet long. Cores from IW-1 were taken at the depths identified in Table 1.

Samples from each core were selected and sent for analysis to an independent laboratory, Ardaman and Associates. These samples were tested for several parameters including permeability, porosity and specific gravity. Core laboratory analysis results and geologic core descriptions are presented in Appendix E. A summary of the hydraulic conductivity from the laboratory analyses of the cores is presented in Table 2.

2.5 Geophysical Logs

At the completion of each stage of hole drilling, geophysical logs were conducted. The purpose of these logs was to assist in casing seat selection, identify confining sequences and to help identify the location of monitoring zones. The geophysical logs performed, including a brief description of the information provided by the logs, are as follows:

- X-Y Caliper - Identification of hole diameter and hole geometry.
- Gamma Ray - Measurement of the natural gamma ray radiation of the formation, used as a tie-in between logs.
- Dual Induction Log - A resistivity log. Identifies differentiation between limestone and dolomite beds, and, along with the gamma ray log, is useful in the correlation of lithologic units.

- Borehole Compensated Sonic Variable Density Log (VDL) - Identification of the confining sequences, as well as identification of zones that could cause problems during cementing.

- Flow Meter Surveys - Determination of where fluid may be entering or exiting the borehole.

- Temperature - Provides a profile of static and dynamic temperature of the borehole, may be useful in determining changes in fluid movement.

- Borehole Televiewer (BHTV) - Determination of where structural features (bedding planes, fractures, vugs and voids) are located.

- Cement Top Temperature - Verification of the annular space fill-up after each cementing stage.

- Cement Bond Log - Used to assess the quality of the bond between the inner casing and the cement grout around the casing. The resulting curve of the log is a function of casing size and thickness, cement strength and thickness, degree of cement bonding and tool centering.

Geophysical logs, which were transmitted to TAC members on a weekly basis during construction, are presented in Appendix F, and are boxed separately. Box 1 contains logs from IW-1 and Box 2 contains logs from MW-1. For convenience, many of the same type of logs were merged together (e.g., the dual induction log for MW-1 presented in Box 2 is continuous from 251 to 1,850 feet bpl). Also in Appendix F is an index of the logs performed and a tabulation of the logs included in each box.

During the geophysical logging and testing of the well, the Engineer was on site to witness the logging and verify quality control procedures. The quality control maintained during the testing program was, to a large extent, provided by Florida Geophysical Logging, Inc. Industry standard quality control measures were observed and are documented on the logs. Detailed information of the tool calibration program utilized by Florida Geophysical Logging is also included in attached Appendix F.

2.6 Video Surveys

Video surveys were conducted and recorded in VHS format in the injection well pilot holes from 1,000 to 1,871 feet bpl, in the injection well pilot and reamed holes from 1,956 to 2,901, and in the injection tubing from land surface to 2,273 feet bpl. Video surveys were also performed on the dual-zone monitoring well from 1,520 to 1950 feet bpl. Color video surveys were made with the camera lens in two positions - downhole with a radial view and uphole with a horizontal rotating position. Air development was used to displace suspended solids from the well prior to performing the television survey. The open hole survey allowed the reviewer to visually inspect the formations encountered in the borehole, as well as to observe potential fractures and water-producing zones. Acceptable picture clarity was obtained in the surveys. A log describing the formation and structural features observed in the open hole of the injection well and monitor well are presented in Appendix G. A copy of videotape survey is also included in Appendix G, however, for convenience, the tapes are boxed separately with the geophysical logs. Injection well IW-1 tapes are included in Box 1, and MW-1 tapes are included in Box 2.

2.7 Packer Tests

Straddle packer tests were performed after pilot hole construction of the injection well. Two inflatable packers (plugs) are set in the borehole and water is pumped from between the packers. Packer tests were conducted at intervals to either support demonstration of confinement, to determine water quality so as to define the base of the Underground Source of Drinking Water (USDW), or to identify potential monitoring zones. The packers were used to isolate zones to perform drawdown and recovery tests. The straddle packer intervals were selected based on reviewing and interpreting information from geophysical logs, lithology, cores and other packer tests. Six straddle packer tests were performed in IW-1. Two of the straddle packer tests performed in the injection well identified acceptable monitoring zones for MW-1

The packers were typically lowered into the pilot hole to the selected interval on the 7⅝-inch (outside) diameter drill pipe, inflated and seated against the formation. A 4-inch diameter submersible pump was lowered into the drill pipe approximately 200 feet to introduce stress on the isolated interval. Prior to starting the tests, each zone was developed free of any drilling fluids by means of air lifting and pumping until the specific conductance stabilized. Development time is identified in Table 3. The isolated zone was then allowed to recover from development before beginning the pumping test. During drawdown and recovery, water level measurements were obtained using a data logger attached to a pressure transducer (In-situ Hermit 2000-C). In addition to the hermit data logger, a battery-operated downhole pressure recorder was used for backup and quality control. The pressure transducer was lowered to a known depth. The method of analysis used on the data collected and recorded during the packer tests was the Modified Non-Equilibrium Formula derived by Cooper and Jacob (1946). The equation of the Cooper-Jacob method is as follows:

$$T = \frac{264Q}{\Delta s}$$

T = coefficient of transmissivity (gpd/ft)
Q = pumping rate (gpm)
Δs = change in drawdown over one log cycle (ft)

The calculated hydraulic conductivity from the packer tests are presented in Table 4. The raw packer test data and data plots are presented in Appendix H. Based on the stabilization of the fluid specific conductance prior to starting the packer tests and the drawdown characteristics of the data shown in this Appendix, all of the hydraulic conductivity values presented from the packer tests are considered valid.

2.8 Packer Test Water Quality

Water samples obtained during the packer tests were analyzed in the field for temperature and conductivity. These water samples were collected during the drawdown phase of the packer test and sent to an independent laboratory for additional analysis. The samples were analyzed and the results are presented in Appendix I. A compilation of the packer test water quality data is presented in Table 5. Log derived water graphs were prepared to compare to the packer test water quality data. This graph shows good correlation, and is presented in Appendix J.

2.9 Casing

Casing heat numbers stamped on the casing were verified with the mill certificates prior to running casing in the hole. Copies of the casing mill certificates are presented in Appendix K. Cementing plans for each casing string were proposed by the Contractor and reviewed by the Engineer prior to cementing. After accepting the proposed plan, casing was set and cemented. A copy of the cement reports for each casing run is presented in Appendix L.

Final casing installations were pressure tested for the injection well and the dual-zone monitor well. The 24-inch injection well casing was pressure tested first. The 16-inch injection well tubing was pressure tested next as part of the demonstration of mechanical integrity and is described in Section 4, Final Testing. The monitor well 16 and 6⅝-inch casings were then pressure tested.

On December 31, 2001, the injection well 24-inch casing was internally pressurized to 152.0 psi. A pressure increase of 0.25 psi was observed over the 60-minute test period. This increase represents a 0.2 percent change in the original pressure, which is within the allowable variance of 5 percent. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M.

On January 11, 2002, the injection well 16-inch injection well tubing was internally pressurized to 153.0 psi. A pressure increase of 6.0 psi was observed over the 60-minute test period. This increase represents a 3.9 percent change in the original pressure, which is within the allowable variance. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M.

On February 11, 2002, the monitor well 16-inch casing was internally pressurized to 151.0 psi. A pressure increase of 0.0 psi was observed over the 60-minute test period. This increase represents a 0.0 percent change in the original pressure, which is within 5.0 percent maximum allowable change. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M.

On February 19, 2002, the monitor well 6⅝-inch injection well casing was internally pressurized to 156.0 psi. A pressure increase of 2.5 psi was observed over the 60-minute test period. This increase represents a 1.6 percent change in the original pressure, which is within 5.0 percent maximum allowable change. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M.

2.10 Cement Bond Logs

Cement bond logs are used to assess the quality of the bond between the casing and the cement grout. The resulting curve of the log is a function of casing size and thickness, cement strength and thickness, degree of cement bonding and tool centering.

The travel time curve (left log track) is run to determine if the tool is properly centered. The critical travel time is the time recorded when the tool is centralized. Factors affecting the travel time curve are cycle skipping that can be caused by fast formation arrivals and formations that are so dense they actually have a faster transit time than the casing. The basic transit time of steel is slower than some dolomites and limestones. On the amplitude curves (center log track), a time gate is set at the time corresponding to the expected arrival of the casing signal, and the amplitude of the signal in that gate is recorded. A high amplitude indicates a larger casing signal, and therefore a poorer cement bond; a low amplitude indicates a good bond.

The variable density display (left log track) displays the entire wave signal. If there is no bond, an arrival is seen at the time corresponding to the casing velocity. As the cement becomes thicker and stronger (compressive strength), the casing signal becomes weaker.

On December 28, 2001, a cement bond log was performed in the injection well 24-inch casing. From the travel time log it can be seen that good tool centralization was maintained for the entire log. The variable density display shows no strong casing signal on any section of the 24-inch casing. The cement bond log conducted in IW-1 demonstrated that there is a good cement seal around the 24-inch diameter casing, and that there are no channels or conduits that would allow fluid movement adjacent to the casing.

On January 7, 2002, a cement bond log was performed in the monitor well 16-inch casing. From the travel time log it can be seen that good tool centralization was maintained for the entire log. The variable density display shows no strong casing signal on any section of the 16-inch casing. The cement bond log conducted in MW-1 demonstrated that there is a good cement seal around the 16-inch diameter casing, and that there are no channels or conduits that would allow fluid movement adjacent to the casing.

On February 18, 2002, a cement bond log was performed in the monitor well 6⅝-inch casing. From the travel time log it can be seen that good tool centralization was maintained for the entire log. The variable density display shows no strong casing signal on any section of the 6⅝-inch casing. The cement bond log conducted in MW-1 demonstrated that there is a good cement seal around the 6⅝-inch diameter casing, and that there are no channels or conduits that would allow fluid movement adjacent to the casing.

2.11 Tubing and Packer

A positive seal packer was installed in the 24-inch casing at a depth of 2,273 feet bpl. The 16-inch injection tubing is seated on the packer and is centered by centralizers. The 16–inch tubing was then cemented in place to surface. A copy of the packer specifications is presented in Appendix N. An as-built profile of IW-1 is presented in Figure 3.

2.12 Monitor Zone Depths

The selection of monitor zones for MW-1 was established based on information available from the drilling and testing of IW-1, and was approved by FDEP. The upper monitor zone was established between 1,520 and 1,550 feet bpl and the lower monitor zone between 1,900 and 1,950 feet bpl. An as-built profile of MW-1 is presented in Figure 4.

3.0 Subsurface Conditions

3.1 Background

This section presents the site-specific geologic and hydrogeologic information obtained during this project and the results of various tests made during construction of IW-1 and MW-1.

3.2 Generalized Geologic Setting

A well-defined, extensive sequence of carbonate sediments is present at the City of Pompano Beach WTP site. This is consistent with information obtained from other projects in the area. The geologic units found during construction of the monitoring well satisfy the requirements of FAC Rule 62-528. Geophysical logging and testing confirmed the presence of a suitable confining sequence and suitable monitor zones. A brief description of the various geologic units follows.

From land surface to approximately 380 feet bpl, the sediments are comprised of limestone, sandy limestone, limey sandstone, sandy clay and varying amounts of unconsolidated shell and sand. The limestone and sandy limestone are a light gray to grayish olive packstone and grainstone. The limey sandstone is generally light gray to grayish yellow and olive, fine to medium-grained and slightly phosphatic. The sandy clay is grayish olive, soft, plastic and slightly calcareous with very fine to fine-grained quartz sand. Various amounts of shell and quartz sand are also present in these sediments.

The dissolution features and generally poor cementation apparent in the upper 380 feet of sediments give this unit the high permeability characteristic of the Biscayne Aquifer. These sediments are Pleistocene to Miocene in age and correspond to descriptions of the Anastasia and Plamico Sand formations.

From approximately 380 to 500 feet bpl, the sediment is predominantly composed of light olive gray, limestone and sandstone with abundant plastic clay. From 500 to about 1,000 feet bpl, the sediment is predominantly yellowish gray to olive plastic clay with very fine grained quartz sand with interbedded limestone occasionally present throughout the interval. The limestone varies from yellowish gray wackestone from 730 to 750 feet bpl to yellowish gray sandy clayey wackestone from 940 to 970. The sediments in the interval between approximately 380 and 1,000 feet bpl are Miocene to Late Eocene in age and correspond to the Hawthorn Formation.

From about 1,000 to 1,840 feet bpl, the sequence is composed almost entirely of limestone, typically a pale orange to grayish orange, fine to medium grained packstone. The limestone in this sequence is Middle to Late Eocene age and is delineated as part of the Avon Park Limestone.

Between 1,840 and 2,925 feet bpl, dolomite is interbedded with limestone, light to moderate yellowish-brown and fine to medium grained to cryptocrystalline. The limestone in this interval is generally very pale orange, pellodial or micritic, fine to medium grained and soft. The television surveys indicate that the dolomite in this zone exhibits extensive dissolution cavities as well as fracturing. The section is comprised of sediments of Early to Middle Eocene Age of the Avon Park Limestone.

The various formations penetrated by IW-1 and MW-1 correlate closely with those encountered in the other wells in the area, demonstrating the continuity and uniformity of the beds. A hydrogeologic cross section of the wells on site is presented in Appendix D.

3.3 Hydrogeologic Setting

The upper 380 feet of rock and sediments are Pleistocene and Upper Miocene sandstone, limestone, clay and unconsolidated sand and shell. These sediments comprise the Biscayne Aquifer that is used as a source of drinking water throughout South Florida.

Underlying the Biscayne Aquifer are approximately 610 feet of Miocene clay and limestone of the Hawthorn Formation that form a confining bed between the Biscayne Aquifer and the Oligocene to Eocene limestones and dolomites of the Floridan Aquifer. The clay and limestone confining sequence is called the Hawthorn Formation. Water from the Floridan Aquifer in South Florida contains concentrations of dissolved solids that exceed drinking water standards. The aquifer is not currently used as a main source of drinking water in Broward County; however, some water utilities have begun to use it.

Within the Eocene limestones, a confining sequence has been identified between 1,570 and 2,293 feet bpl as discussed later in Section 3.5. It consists of a thick sequence of dense limestone with some interbedded layers of dolomite and is discussed in greater detail later in this report. A hydrogeologic column is presented at the end of Appendix D.

3.4 Water Quality

Water samples were collected from isolated sections of the borehole during the straddle packer tests. The water samples from the packer tests were analyzed for selected parameters to establish background water quality and to identify the depth at where there is 10,000 mg/L of total dissolved solids (TDS).

The tests were conducted in intervals considered suitable as confining zones and intervals suitable as monitor zones. During the packer tests, a sample of the formation water from the tested interval was collected just prior to shutting off the pump, after significant development time. Water samples from the packer tests were analyzed for TDS, chloride, sulfate, specific conductivity, ammonia as nitrogen, nitrate as nitrogen, nitrite as nitrogen, total kjeldahl nitrogen, and total organic nitrogen.

Results of the laboratory analyses are presented in Appendix I. Table 5 summarizes the results of the laboratory analyses from the packer tests.

The base of the USDW is defined as water having less than 10,000 mg/l TDS. The base of the USDW was identified by performing water quality analysis on samples obtained from packer tests and geophysical log interpretation. Based on the water quality testing, the base of the USDW currently occurs 1,570 feet bpl. Also used in determining TDS is the dual induction geophysical log. From this log water quality can be derived. The log derived water quality data places the base of the USDW at 1,570 feet. This data is confirmed by the water quality results of the packer test conducted in IW-1 between 1,763 and 1,779 feet bpl, which yielded 10,500 mg/L total dissolved solids. A copy of the log derived water quality graph from IW-1 is attached and is presented in Appendix J.

3.5 Confinement Analysis

The approach to the evaluation of vertical confinement at the City of Pompano Beach WTP is as follows. Available borehole geophysical, geological data and open hole testing data were used to identify intervals from 1,570 (base of the USDW) to 3,000 feet bpl that exhibit confining properties. The vertical confinement provided by each interval was then evaluated. Particular attention was paid to locating beds of limestone, dolomite, clay or marl that have low matrix vertical hydraulic conductivities and are not penetrated by fractures and/or solution cavities. Such tight beds provide the primary vertical confinement of the injected concentrate.

3.5.1 Identification of Confining Units

The presence of satisfactory confining sequences between 1,570 and 3,000 feet bpl was established at the WTP during the drilling of IW-1. A letter previously submitted to the TAC documented the presence of this confinement on site. This letter from the Engineer is dated August 30, 2001 and is referred to as the "24-inch Casing Seat Request".

3.5.2 Geophysical Logs

The wire line geophysical logs for IW-1 were examined in detail for the presence of units of rock that could provide vertical confinement for injected fluids. A combination of sonic, caliper and resistivity logs was used to identify well-cemented limestone and/or dolomite beds that would be expected to have low matrix porosities and hydraulic conductivities. Borehole video surveying logs were used to locate fractures and/or cavernous zones that could be conduits for vertical fluid flow. Information on the orientation and thickness of beds was also obtained from the borehole video survey logs.

The development and conditioning of the wells prior to logging is not an issue for the sonic, caliper, gamma ray, temperature, resistivity and borehole video survey logs as these logs were designed to and are often run in mudded boreholes. Fine scale features, such as bed contacts, are readily distinguishable on the borehole video survey log, which indicates that borehole conditions did not have a significant adverse effect on log quality.

Flowmeter, temperature, and fluid resistivity/conductivity logs provide information on the location of flow zones into wells and on changes in the salinity of formation water. Temperature and fluid resistivity/conductivity logs did not provide useful information concerning vertical confinement in the 2,000 to 3,000 feet bpl interval. Flowmeter logs are of limited value for identifying individual beds with low vertical hydraulic conductivities because a single zone of high hydraulic conductivity very often dominates the flow for the entire tested interval.

3.5.3 Characterization of Well Cuttings

Cuttings collected during the pilot hole drilling of in IW-1 (land surface to 3,000 feet bpl) were examined in detail for lithology, macroporosity (visible porosity) and apparent matrix hydraulic conductivity using a stereomicroscope. A copy of the geologic log is attached. The cuttings were grab samples collected at 10-foot intervals during the construction of the well. The lithology of the limestone cuttings was characterized using the limestone classification scheme of Dunham (1962). The most common grain types were silt to fine-sand sized rounded carbonate grains that are described as either peloids (fecal pellet-shaped grains of indeterminate origin) or as bioclasts (transported fossil fragments). The mineralogy of the samples (calcite versus dolomite) was confirmed by reaction with dilute hydrochloric acid. Dolomite was classified according to crystal size as being either cryptocrystalline (crystals are not visible with the low powered microscope) or microcrystalline (crystals are visible with the low-powered microscope), finely crystalline (1/64 to 1/16 mm) or medium crystalline (1/16 to 1/4 mm).

The macroporosity (visible porosity) of the samples was characterized as being either very low (< 2%), low (2-5%), moderate (5-15%), high (15-25%), or very high (>25%). The apparent matrix hydraulic conductivity was qualitatively evaluated as being very low to high based on the porosity, size of the pores, and likely degree of interconnection of the pores. Geological logs for each well are contained in Appendix D.

3.5.4 Core Examination and Data Analysis

The eight cores were taken from 1,725 to 2,030 feet bpl in IW-1. The lithology of the cores was evaluated to determine if there were any significant biases in the cutting samples. The well cuttings appeared to have somewhat less intergranular carbonate mud than the cores. In some limestone cuttings, the carbonate mud appeared to have been washed out of the samples during drilling. Some limestone cuttings, particularly grainstone and packstone lithologies, thus appear to be more porous than they actually are. The cores were also examined for the presence of fractures or solution features (vugs) that might be conduits for vertical fluid flow. A copy of the core descriptions is contained in Appendix E. Sections of each core were selected and submitted for laboratory analysis for hydraulic conductivity. Results from the laboratory core analysis are summarized in Table 2. The complete laboratory analysis is presented in Appendix E.

3.5.5 Packer Test Data

Straddle packer test data collected during the drilling of IW-1 were analyzed for information on the hydraulic conductivity of potential confining units. The straddle packer data were analyzed using the Cooper and Jacob (1946) modification of the Theis (1935) non-equilibrium equation (i.e., the straight-line method). The transmissivity values calculated from both the pumping and recovery phase data for each test were similar.

It should be noted that the transmissivity and average hydraulic conductivities values calculated from the packer test data are largely a function of horizontal hydraulic conductivities. Packer test data thus tend to overestimate vertical hydraulic conductivities. For example, a packer test performed on an interval containing one or more high hydraulic conductivity beds interbedded between very low hydraulic conductivity beds would give a high transmissivity and average hydraulic conductivity value whereas the interval would have a very low vertical hydraulic conductivity. The results from each packer test are contained in Appendix H. A summarization of the results of the packer tests is shown in Table 4.

Two laboratory analyses were conducted on water samples collected from the packed off interval between 1,861 and 1,877 feet bpl. Although the test results indicated a zone of TDS, the water quality reported was greater than 10,000 (mg/L) Total Dissolved Solids. More specifically, the TDS results of 20,200 mg/L and 20,374 mg/L are well above the 10,000 mg/L threshold. Table 5 illustrates that water samples collected during the four packer tests conducted between 1,631 and 1,827 feet bpl yielded higher analytical values for TDS than did the interval between 1,861 and 1,877 feet bpl. The log derived water quality plot corroborates the laboratory results. In addition, the video survey of this zone indicated a horizontal fluid flow that is also evident on the flow meter log.

3.5.6 Stratigraphic Correlation

The geologic and geophysical logs of IW-1, and MW-1 indicates excellent correlation as would be expected from wells in such close proximity. An example of this excellent correlation can be seen when the dual induction logs from IW-1 and MW-1 are placed side by side. With the logs in this position, it can be seen that the logs are nearly identical. Examples of this can be seen on the gamma ray log with peaks at 1,520 feet bpl are at the same depth and of the same magnitude. This correlation can also be seen on the VDL and dual induction logs.

3.5.7 Testing Quality Control Quality Assurance

For each of the testing procedures conducted, quality control and quality assurance procedures were implemented and documented. A copy of the calibration theory and practice for the geophysical logs conducted are contained in Appendix F. Quality control procedures for the packer testing are contained in Appendix H.

3.5.8 Criteria for Identification of Confinement Intervals

Beds or intervals of rock that are likely to offer good vertical confinement were identified using the following criteria:

- Low sonic transit times and derived sonic porosities.
- Variable density log (VDL) pattern consisting of either straight parallel vertical bands, where lithology is relatively uniform, or a "chevron" pattern of continuous parallel bands, where the formation consists of interbedded rock with differing densities and/or degrees of consolidation. Fractured rock typically has an irregular VDL log pattern.
- Low hydraulic conductivities calculated using packer pump test data.
- Low macroporosity (i.e., visible pore spaces) and a high degree of cementation (hardness) as observed in microscopic examination of cuttings and core samples.
- Borehole diameters on caliper logs close to the bit size. Fractured dolomite and limestone is commonly manifested by an enlarged borehole.
- Relatively high resistivities, which in the middle and lower Floridan Aquifer System are often indicative of tight dolomite and or limestone beds.
- Absence of evidence of fractures on the video survey and borehole televiewer log.

3.6 Confinement Intervals

The confinement properties of the strata between the base of the USDW (+/- 1,570 feet bpl) and 3,000 feet bpl was evaluated using the above criteria and data. The confining intervals are discussed below.

3.6.1 Interval From 1,680 to 1,830 Feet BPL

This interval consists predominantly of light-colored limestone and dolomitic limestones. Grainstones and packstones are the most common lithologies. The grainstones and packstones are interbedded with subsidiary beds of carbonate-mud rich lithologies (fossiliferous mudstones and wackestones). The borehole televiewer log indicates that the beds are horizontal and range in thickness from approximately 0.5 to 10 feet. The bedding appears to consist of stacked sequences of carbonate sand-rich (grainstones and packstones) and carbonate mud-rich (packstones to mudstones) limestones. The mudstone and wackestone beds, which have low macroporosities and are well cemented, can provide better vertical confinement than the thicker grainstone and packstone beds.

A packer tests was performed over the interval 1,679-1,695, 1,731-1,747 and 1,811-1,827 feet bpl within this confinement interval and yielded hydraulic conductivities ranging from 1.4 x 10 $^{-4}$ to 2.3 x 10 $^{-4}$ cm/sec. Laboratory analyses of hydraulic conductivities of cores collected over this interval ranged from 4.6 x 10 $^{-5}$ to 2.5 x 10 $^{-8}$ cm/sec. No evidence of vertical fractures or solution cavities was visible on the borehole televiewer log or the television survey video. The geological and geophysical data for this interval are characteristic of good vertical confinement.

3.6.2 Interval From 1,900 to 2,025 Feet BPL

This interval consists of interbedded light-colored limestones and dolomites. Grainstones and packstones are the most common lithologies. The grainstones and packstones are interbedded with subsidiary beds of carbonate-mud rich lithologies (fossiliferous mudstones and wackestones). The borehole televiewer log indicates that the beds are horizontal and range in thickness from approximately 0.5 to 10 feet. The bedding appears to consist of stacked sequences of carbonate sand-rich (grainstones and packstones) and carbonate mud-rich (packstones to mudstones) limestones. The mudstone and wackestone beds, which have low macroporosities and are well cemented, can provide better vertical confinement than the thicker grainstone and packstone beds.

A packer test was performed over the interval 1,931-1,947 feet bpl within this confinement interval and yielded hydraulic conductivities ranging from 3.7 x 10 $^{-5}$ to 4.1 x 10 $^{-5}$ cm/sec. Laboratory analyses of hydraulic conductivities of cores collected over this interval ranged from 1.1 x 10 $^{-3}$ to 6.0 x 10 $^{-10}$ cm/sec. No evidence of vertical fractures or solution cavities was visible on the borehole televiewer log or the television survey video. The geological and geophysical data for this interval are characteristic of good vertical confinement.

3.6.3 Confinement Summary

During the drilling and testing of these wells at the City of Pompano Beach WTP, an extensive program was implemented to identify confinement between the base of the USDW and the depth 3,000 feet bpl. A number of cores and packer tests were performed over a relatively small depth interval.

The limestones and dolomites present from 1,680 to 2,025 feet bpl in IW-1 have geological and geophysical characteristics indicative of good confinement. The available borehole televiewer and television surveys show no evidence of fractures or cavernous zones that could be conduits for the upward migration of injected concentrate. The majority of the 1,680 to 2,025 feet bpl interval consists of horizontally bedded, fossiliferous limestone. The limestones have visible porosities (i.e. macroporosities) estimated to range mostly between 0 and 15%. Sonic and core sample total porosities range mostly between 33 and 45%. The majority of the porosity of the limestones is microporosity (microporosity = total porosity minus macroporosity). Microporosity rocks, where unfractured, typically have low hydraulic conductivities. The vertical hydraulic conductivity of core samples range from 3.5×10^{-10} to 2.5×10^{-3} cm/sec.

The combined hydrogeological, geological and geophysical data provide reasonable assurance that confinement exists below the USDW.

4.0 Final Testing

4.1 General

After the injection well construction was completed, the injection well was tested for mechanical integrity, which also included collection of background water samples from MW-1, and performance of a short-term injection test on IW-1. The mechanical integrity testing (MIT) includes a hydrostatic pressure test of the injection casing, a temperature log, a video survey and a radioactive tracer survey (RTS). The short-term injection test consisted of injecting raw groundwater from the City's western wellfield into the well for a twenty four-hour period.

4.2 Background Water Quality

Water samples were obtained from both the upper and lower monitor zones of MW-1, and from the IW-1 injection zone. Prior to sampling, the wells were developed by using the reverse air procedure then allowing the well to flow naturally for a minimum of three well volumes. The samples were analyzed for a variety of constituents to establish the "natural" or background quality of the water. Background water quality laboratory analytical results from the injection zones of IW-1 and the upper and lower monitor zones of MW-1 are presented in Appendix O.

Water samples of the western wellfield, and the reclaimed water treatment facility was also analyzed, and the results of the analyses are presented in Appendix O.

4.3 Mechanical Integrity Testing

In accordance with FAC Rule 62-528, the injection well was tested for mechanical integrity. Testing consisted of a hydrostatic pressure test of the injection casing, a temperature log, a television survey and a RTS. The hydrostatic pressure test, which was conducted at a pressure at least 50 percent greater than the maximum allowable operating pressure, identifies internal casing integrity. The temperature log identifies temperature variations in the well. The television survey provides visual verification of internal casing integrity. The radioactive tracer survey provides data on the external mechanical seal of the casing. The following describes the testing methods, results of the testing and presents the interpretation of the data collected during the mechanical integrity tests.

4.3.1 Casing Pressure Test

On December 31, 2001, the injection well 24-inch casing was internally pressurized to 152.0 psi. A pressure increase of 0.25 psi was observed over the 60-minute test period. This increase represents a 0.2 percent change in the original pressure, which is within the allowable change of 5 percent. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M. Albert Muniz, P. E., and Dan Phelps, P.G. (FDEP) witnessed the casing pressure test.

On January 11, 2002, the injection well 16-inch injection well tubing was internally pressurized to 153.0 psi. A pressure increase of 6.0 psi was observed over the 60-minute test period. This increase represents a 3.9 percent change in the original pressure, which is within the allowable change of 5 percent. A copy of the test gauge certification records and certified results of the hydrostatic pressure test are contained in Appendix M. Albert Muniz, P. E., and Dan Phelps, P.G. (FDEP) witnessed this test.

4.3.2 Injection Well No. 1 Temperature Log

On March 22, 2002, Florida Geophysical Logging, Inc. conducted a temperature log on IW-1 from the surface to a total depth of 2,901 feet bpl. The temperature log showed a decline from about 75 degrees Fahrenheit to about 69 degrees Fahrenheit to a depth of 2,404 feet bpl. Below this point, the temperature decreases to about 57 degrees Fahrenheit to a total depth of 2,901 feet. James A. Wheatley, P.G. witnessed the test. A copy of the temperature log is contained in Appendix F.

4.3.3 Injection Well No. 1 Television Survey

Video surveys of IW-1 were performed on January 6, 2002, and January 11, 2002. The surveys were performed from pad level to a depth of 2,895 feet bpl. Water clarity was good, enabling the camera to capture clear images of the tubing interior, packer assembly, casing seat and open-hole section. The survey revealed that the tubing was in excellent condition. A video copy of the television survey is included in Appendix G.

4.3.4 Injection Well No. 1 Radioactive Tracer Survey

On March 22, 2002, a RTS was conducted on IW-1. A schematic of the logging tool is shown in Figure 5. The test began with Florida Geophysical Logging, Inc., conducting a background gamma ray log (GRL) and a casing collar locator (CCL). The background GRL was "memorized" and subsequently reprinted on each out-of-position logging run to serve as a means of comparison. Each logging run is identified by its name presented at the top of the log. After the completion of the background GRL, the logging tool ejector was calibrated to a 0.25 millicurie (mCi) per second discharge, and the reservoir was loaded with 10 mCi of radioactive Iodine 131. James A. Wheatley, P.G., and Dan Phelps, P.G. (FDEP) witnessed the RTS test.

The first test conducted was a dynamic test (TEST #1). An injection rate of 45 gpm was established using potable water. For this test, the tracer ejector port was positioned five feet above the bottom of the casing (2,288 feet) and 1 MCi slug of tracer material was released under pumping conditions. Time drive monitoring was started upon release of the tracer. At about the 20-second mark, the middle detector (located 3.1 feet below the ejector) showed evidence of the slug dispersing downward from the ejector. At about the 4-minute mark, the bottom gamma ray detected the tracer slug. No increase in gamma detection by the top gamma ray detector was seen during the 60-minute monitoring period. The tools were then logged out of position (LOG OUT OF POSITION #1) to a depth of 2,077 feet bpl. Results of the log out position showed no indication of tracer material movement up hole, however a small amount of residual tracer material released from the ejector port was detected at 2,230 feet bpl. The injection casing was then flushed with approximately 25,000 gallons of western well field raw water. Following the flushing, an out of log position was conducted (LOG AFTER FLUSH #1) from below the casing to 2,083 feet bpl. This log shows no indication of tracer material movement up hole. These results are interpreted as providing evidence that the casing integrity is sound and there are no channels behind the casing.

The next test conducted was a second dynamic test (TEST #2). An injection rate of 98 gpm was established using potable water. For this test, the tracer ejector port was positioned five feet above the bottom of the casing (2,288 feet) and 1 MCi slug of tracer material was released under pumping conditions. Time drive monitoring was started upon release of the tracer. At about the 20-second mark, the middle detector (located 3.1 feet below the ejector) showed evidence of the slug dispersing downward from the ejector. At about the 2-minute mark, the bottom gamma ray detected the tracer slug. No increase in gamma detection by the top gamma ray detector was seen during the 60-minute monitoring period. The tools were then logged out of position (LOG OUT OF POSITION #2) to a depth of 2,078 feet bpl. Results of the log out position showed no indication of tracer material movement up hole. The injection casing was then flushed with approximately 30,000 gallons of western well field raw water. Following the flushing, an out of log position was conducted (LOG AFTER FLUSH #2) from below the casing to 2,084 feet bpl. This log shows no indication of tracer material movement up hole. These results are interpreted as providing evidence that the casing integrity is sound and there are no channels behind the casing.

The third and final test conducted was also a dynamic test (TEST #3). An injection rate of 6,000 gpm was established using western well field raw water. For this test, the tracer ejector port was positioned five feet above the bottom of the casing (2,288 feet) and 4 MCi slug of tracer material was released under pumping conditions. Time drive monitoring was started upon release of the tracer. At about the 2-second mark, the middle detector (located 3.1 feet below the ejector) showed evidence of the slug dispersing downward from the ejector. At about the 4-second mark, the bottom gamma ray detected the tracer slug. No increase in gamma detection by the top gamma ray detector was seen during the 60-minute monitoring period. The tools were then logged out of position (LOG OUT OF POSITION #3) to a depth of 2,097 feet bpl. Results of the log out position showed no indication of tracer material movement up hole. These results are interpreted as providing evidence that the casing integrity is sound and there are no channels behind the casing.

Following the LOG OUT POSITION #3, the logging tool was lowered to a depth of 2,400 feet bpl and the remainder of the tracer material was released. The tools were then lowered to 2,600 feet and a final background log was conducted.

4.3.5 MIT Conclusions

Based on the results of the temperature log, hydrostatic pressure tests, video survey and radioactive tracer survey, IW-1 has demonstrated to have mechanical integrity.

4.4 Injection Test

On March 21, 2002, a controlled injection test was conducted on IW-1 utilizing raw groundwater from the City's western wellfield as the source of water for testing. The test consisted of a 24-hour background period, during which transducers were placed at a depth of 2,263 feet bpl in IW-1 to monitor bottom hole pressure changes. Transducers were also placed such that wellhead pressure changes of IW-1 and both zones of MW-1 could be monitored. After performing background monitoring, the 12-hour test was started. The injection test was conducted at two different injection rates. The first rate of 5,540 gpm (10.1 ft/sec) lasted 11 hours, while the injection rate was increased during the last hour of the test the rate was increased to 6,800 gpm (12.3 ft/sec). These injection rates represent the maximum anticipated flows when the water treatment plant is fully operational. Maximum injection pressures are estimated to be less than 90 psi. The maximum wellhead pressure during the test was 48 psi, which is well within the allowable 2/3 of the pressure test conducted on the annulus. Wellhead shut-in pressure is approximately 17 psi. A copy of the data obtained during the injection test as well as a site survey and wellhead elevations are presented in Appendix P. A summary of the injection rates and wellhead pressure is presented below:

Injection Rate (gpm)	Wellhead Pressure (psi)	Specific Injectivity (gpm/psi)
5,540	39.0	142.05
6,800	48.0	141.67

5.0 Findings and Recommendations

5.1 Findings

The following list summarizes the findings identified during the construction of the injection and monitor wells:

- The base of the USDW, the point where the water contains 10,000 mg/L TDS, occurs at 1,570 feet bpl.
- The confining sequence generally occurs between 1,570 feet and 2,293 feet bpl.
- Vertical hydraulic conductivity determined from core testing within the confining sequences ranged from 5.9×10^{-10} to 1.1×10^{-3} cm/sec.
- Hydraulic conductivity was determined from packer testing within the confining sequences ranging from 4.1×10^{-5} to 2.1×10^{-4} cm/sec.
- The data demonstrates the existence of an extremely transmissive injection zone below 2,293 feet bpl saturated with saline water (containing more than 10,000 mg/L TDS).
- The injection zone is capable of accepting the maximum design flowrate equivalent to a velocity of 12 feet per second in the wells at a reasonable injection pressure that will not promote fractures in the injection zone or confining sequences.
- IW-1 was successfully pressure tested at 153 psi (24-inch casing) and at 152 psi (16-inch tubing).
- The testing program has demonstrated that IW-1 has mechanical integrity.
- One dual-zone monitor well was drilled with the upper lower monitor zone located from 1,520 to 1,550 feet bpl, and the lower zone from 1,900 to 1,950 feet bpl.

5.2 Conclusions

The presence of favorable geologic conditions, a highly transmissive injection zone filled with water having greater than 10,000 mg/L TDS, suitable confining sequence, and suitable monitor zones will permit the use of injection wells for disposal. This well will be used to dispose concentrate from the nanofiltration WTP and backwash filter water from the reclaimed water facility at the City of Pompano Beach WTP in accordance with existing state and federal underground injection control regulations.

Based on the results of the geophysical logging and testing performed at the City of Pompano Beach WTP, IW-1 has mechanical integrity and is ready to begin operational testing.

5.3 Recommendations

Operation of the monitor well is to begin within one month after the construction of the surface facilities is complete. Injection well operation may begin operating under the construction permit after operational testing approval is issued by FDEP.

The following recommendations are in accordance with requirements of FAC Rule 62-528 for the safe operation of an injection well system. These procedures should be carried out conscientiously to ensure compliance with the injection well construction permit (refer to Appendix A) and all regulatory requirements and to ensure successful operation of the well. Additional information on monitoring and reporting data is discussed in Section 5.4.

- Dual-zone monitor well pressure is to be continuously monitored.
- Injection wellhead pressure is to be continuously monitored.
- Flow to injection well is to be continuously monitored.
- Dual zone monitor well water quality is to be monitored weekly.
- Waste stream (plant concentrate) water quality is to be monitored monthly.
- Injection well injectivity tests are to be performed quarterly.
- A complete analysis of the waste stream is to be performed yearly.
- Injection well mechanical integrity tests are to be performed every five years.
- The six shallow pad wells are to be maintained for future use.

5.4 Well Operation, Maintenance and Future Testing

When the injection well is operational, a variety of data will be collected to satisfy statutory/permit requirements and to assist in managing the system. This section discusses the basic requirements for data collection to maintain permit compliance during both the initial testing and long-term operation of the injection well system. Initially, the injection wells will be operating under the construction permits. Six months of operation are required before the City can apply for an operating permit. The construction permit for IW-1 expires March 21, 2006. It is essential that the performance data collection begin upon operational startup to establish baseline information that both satisfies regulatory requirements and serves for future data comparison and performance analyses. These records should be permanently maintained.

5.4.1 Monitor Well Data Collection

The purpose of monitor zone data collection is to detect changes in water quality attributable to the injection of treated concentrate into the nearby injection well. To collect the water quality samples, the monitor zones at the dual-zone monitoring well will be equipped with two sampling pumps, one for each zone. Interconnection of piping from the different zones and wells is not permitted by FDEP. Prior to collecting water samples for analysis, at least three well volumes have to be pumped from the monitor zones. Well water is pumped to the sample sinks in the injection well pump station. Excess well water is discharged into the injection well pump station wetwell, and is pumped down the injection wells.

Dual-zone monitor well water quality is to be monitored through weekly samples from the two dual-zone monitor well zones which are to be collected and analyzed weekly for TOC, TDS, chloride, fluoride, ammonia, TKN, nitrate, nitrite, pH, specific conductance, total phosphorous, sulfate, temperature. Monthly sampling is required for gross alpha, radium 226, and radium 228. The results of these analyses are to be sent to the FDEP monthly.

Dual-zone monitor well water quality is to be monitored through monthly samples from the lower monitor well zone which are to be collected and analyzed monthly for calcium calculated hardness, calcium and magnesium calculated hardness, total hardness as CaCO3, iron, and gross alpha. The results of these analyses are to be sent to the FDEP monthly.

The pressure in both zones of the dual-zone monitor well is to be continuously monitored and recorded. Daily and monthly average, maximum and minimum pressures are to be reported to FDEP monthly.

5.4.2 Injection Well Data Collection

Beginning with the start of the use of injection well, injection records should be maintained to evaluate injection well performance.

The pressure at the injection wellhead is to be continuously monitored and recorded. Daily monthly average, maximum and minimum pressures are to be reported to FDEP monthly.

The flowrate into the injection well is to be continuously monitored and recorded. Daily average, maximum, and minimum flow rates, as well as the total volume of concentrate pumped into the well are to be reported to the FDEP on a monthly basis.

5.4.3 Injectivity Testing

Periodic determination of the injectivity of a well is used as a measure of the efficiency of a well and is a permit requirement as a management tool for the injection well system. The injectivity test involves injecting concentrate into a well at three (or more) injection rates and recording the injection pressure for each rate. The shut-in pressure of the injection well is to be measured before each different injection rate. The injectivity is calculated by dividing the injection rate by the required injection pressure (wellhead injection pressure minus shut-in wellhead pressure). The result is expressed as gallons per minute per pounds per square inch (mgd/psi).

Factors affecting the injection wellhead pressure are a function of:

- The density differential between concentrate and the formation water in the injection zone;
- The friction loss in the casing; and
- The bottom hole pressure (injection zone transmissivity).

The latter is fairly constant as long as the temperature and density of the injection and formation fluids remain constant. Friction loss in the casing and bottom hole pressure can vary as a result of changes in the flowrate, physical condition of the injection zone and physical condition of the pipe. In general, pressure builds slowly with time (for a given pumping rate) as the casing "ages". Similarly, plugging of an injection zone can cause a gradual pressure build-up over time. Testing is required to be conducted quarterly for the life of the well. The testing rates for injectivity testing should be established as soon as the well is placed in operation. The test procedure should be easily repeatable.

A specific injectivity test is required to be performed quarterly. The pumping rates should be established after the well is in operation. Flow to the wells and wellhead pressures are to be recorded during this period. Test results are to be reported to the FDEP upon completion of the testing.

5.4.4 Mechanical Integrity Testing

An injection well has mechanical integrity when there is no leak in the casing and no fluid movement into the underground source of drinking water through channels adjacent to the well bore. Mechanical integrity testing includes a pressure test, a radioactive tracer survey, a high resolution temperature log and a television survey. This testing will be used, along with the monitoring data of the upper and lower monitor zones, to demonstrate the absence of fluid movement above the injection zone.

An interim internal mechanical test consisting of a pressure test pursuant to Rule 62-528 is to be conducted half way between the standard five-year mechanical integrity test. Based on the date of testing during construction, the next interim internal mechanical test is to be performed on IW-1 on September 22, 2004. This interim test shall consist of pressure testing of the tubing (i.e., 16-inch diameter casing).

The injection well is to be tested for mechanical integrity every five years in accordance with FAC Rule 62-528. Based on the date of testing during construction, the next MIT to be performed on IW-1 is March 22, 2007. The proposed MIT plan must be approved by FDEP prior to performing mechanical integrity testing. Request for approval should be made approximately six months prior to the required completion date.

5.4.5 Waste Stream Analysis

Samples from the waste stream are to be collected and analyzed monthly for TOC, TDS, TSS, chloride, fluoride, ammonia, TKN, nitrate, nitrite, pH, specific conductance, total phosphorous, sulfate, temperature, gross alpha, radium 226, and radium 228. The results of these analyses are to be sent to the FDEP monthly. During operational testing and quarterly thereafter samples from the waste stream are to be collected and analyzed monthly for calcium calculated hardness, calcium and magnesium calculated hardness, total hardness as CaCO3, iron, and gross alpha.

5.5 Plugging and Abandonment Plan

In the event that an injection well has to be abandoned, the well must be effectively sealed (or plugged) to prevent upward migration of the injection zone fluid or the interchange of formation water through the borehole or along the casing. The plugging program will require the services of a qualified drilling contractor with equipment capable of installing drill pipe to a depth of 2,901 feet and pumping neat cement.

The following procedures would be followed to abandon an injection well:

- Obtain a permit from the FDEP.
- Suppress the wellhead pressure with drilling mud.
- Remove the wellhead assembly.
- Fill the open hole with crushed limestone.
- Place a sand cap on the crushed limestone to the bottom of the 24-inch casing.
- Fill the 24-inch casing with neat cement.

The following procedures would be followed to abandon the dual-zone monitor well:

- Obtain a permit from the FDEP.
- Suppress the wellhead pressure with drilling mud.
- Remove the wellhead assembly.
- Fill the deep zone and the 6⅝ -inch diameter casing with neat cement grout.
- Fill the shallow zone and the 16-inch diameter casing with neat cement grout

TABLES

Table 1

Core Depths for Concentrate Disposal Well IW-1
City of Pompano Beach

Core #	Depth (feet bpl)	Date
1	1,725 - 1,735	06/13/01
2	1,795 -1,805	06/14/01
3	1,876.5 - 1,887.5	06/16/01
4	1,920 - 1,930	06/18/01
5	1,960 - 1,970	06/19/01
6	1,975 - 1,985	06/19/01
7	2,000 - 2,010	06/20/01
8	2,020 - 2,030	06/21/01

Table 2
Hydraulic Conductivity Derived from Cores
City of Pompano Beach

Core	Interval	Vertical (cm/sec)	Horizontal (cm/sec)
Core #2	1,795.8 – 1,796.3	4.6 X 10^{-5}	6.8 X 10^{-5}
	1,796.3 – 1,796.9	4.8 X 10^{-5}	5.6 X 10^{-5}
	1,801.9 – 1,802.6	2.5 X 10^{-5}	9.8 X 10^{-6}
Core #3	1,878.5 – 1,879.1	2.8 X 10^{-8}	3.5 X 10^{-10}
	1,880.1 – 1,880.7	1.1 X 10^{-9}	3.0 X 10^{-7}
Core #4	1,922.3 – 1,922.7	7.5 X 10^{-4}	8.9 X 10^{-4}
	1,925.1 – 1,925.6	1.1 X 10^{-3}	2.5 X 10^{-3}
Core #5	1,960.0 – 1,960.6	2.7 X 10^{-5}	7.7 X 10^{-5}
	1,962.5 – 1,963.4	1.6 X 10^{-5}	2.8 X 10^{-5}
	1,965.2 – 1,966.0	1.9 X 10^{-6}	6.5 X 10^{-5}
	1,967.0 – 1,967.4	2.9 X 10^{-4}	2.2 X 10^{-3}
Core #6	1,979.0 – 1,979.5	4.6 X 10^{-5}	3.0 X 10^{-4}
	1,982.3 – 1,982.9	5.3 X 10^{-6}	9.4 X 10^{-6}
	1,983.3 – 1,984.1	5.4 X 10^{-7}	3.5 X 10^{-7}
Core #7	2,000.0 – 2,001.1	7.4 X 10^{-9}	6.0 X 10^{-10}
	2,002.5 – 2,003.0	6.1 X 10^{-9}	8.2 X 10^{-10}
	2,007.1 – 2,007.9	9.4 X 10^{-9}	1.2 X 10^{-9}
Core #8	2,021.8 – 2,022.5	4.3 X 10^{-5}	5.9 X 10^{-10}
	2,022.9 – 2,023.4	3.3 X 10^{-6}	8.5 X 10^{-10}

Table 3
Straddle Packer Test Development
City of Pompano Beach

Test #	Depth (feet bpl)	Well	Air Development Time (min)	Air Development Rate (gpm)	Pump Development Time (min)	Pump Development Rate (gpm)
1	1,631 – 1,647	IW-1	90	166	270	78
2	1,731 – 1,747	IW-1	180	50	285	26
3	1,931 – 1,947	IW-1	510	23	270	5
4	1,679 – 1,695	IW-1	420	62	165	28
5	1,811 – 1,827	IW-1	420	46	300	18
6	1,519 – 1,550	IW-1	435	65	300	29

Table 4
Hydraulic Conductivity Derived from Packer Tests
City of Pompano Beach

Depth Interval (feet bpl)	Well	Pumping Rate (gpm)	Maximum Drawdown (feet)	Drawdown Hydraulic Conductivity (cm/sec)	Drawdown Transmissivity (gpd/ft)	Recovery Hydraulic Conductivity (cm/sec)	Recovery Transmissivity (gpd/ft)
1,519 – 1,550⁽¹⁾	IW-1	---	---	---	---	---	---
1,631 – 1,647	IW-1	78	82.6	1.0×10^{-3}	339	1.0×10^{-3}	339
1,679 – 1,695	IW-1	28	141.8	2.1×10^{-4}	72	2.3×10^{-4}	78
1,731 – 1,747	IW-1	26	152.8	1.8×10^{-4}	61	1.8×10^{-4}	61
1,811 – 1,827	IW-1	18	121.3	1.6×10^{-4}	54	1.4×10^{-4}	47
1,861 – 1,877⁽¹⁾	IW-1	---	---	---	---	---	---
1,931 - 1,947	IW-1	6	164.6	4.1×10^{-5}	14	3.7×10^{-5}	12

(1) - Packer test used to obtain water quality data

Table 5
Water Quality Analysis from Packer Tests
City of Pompano Beach

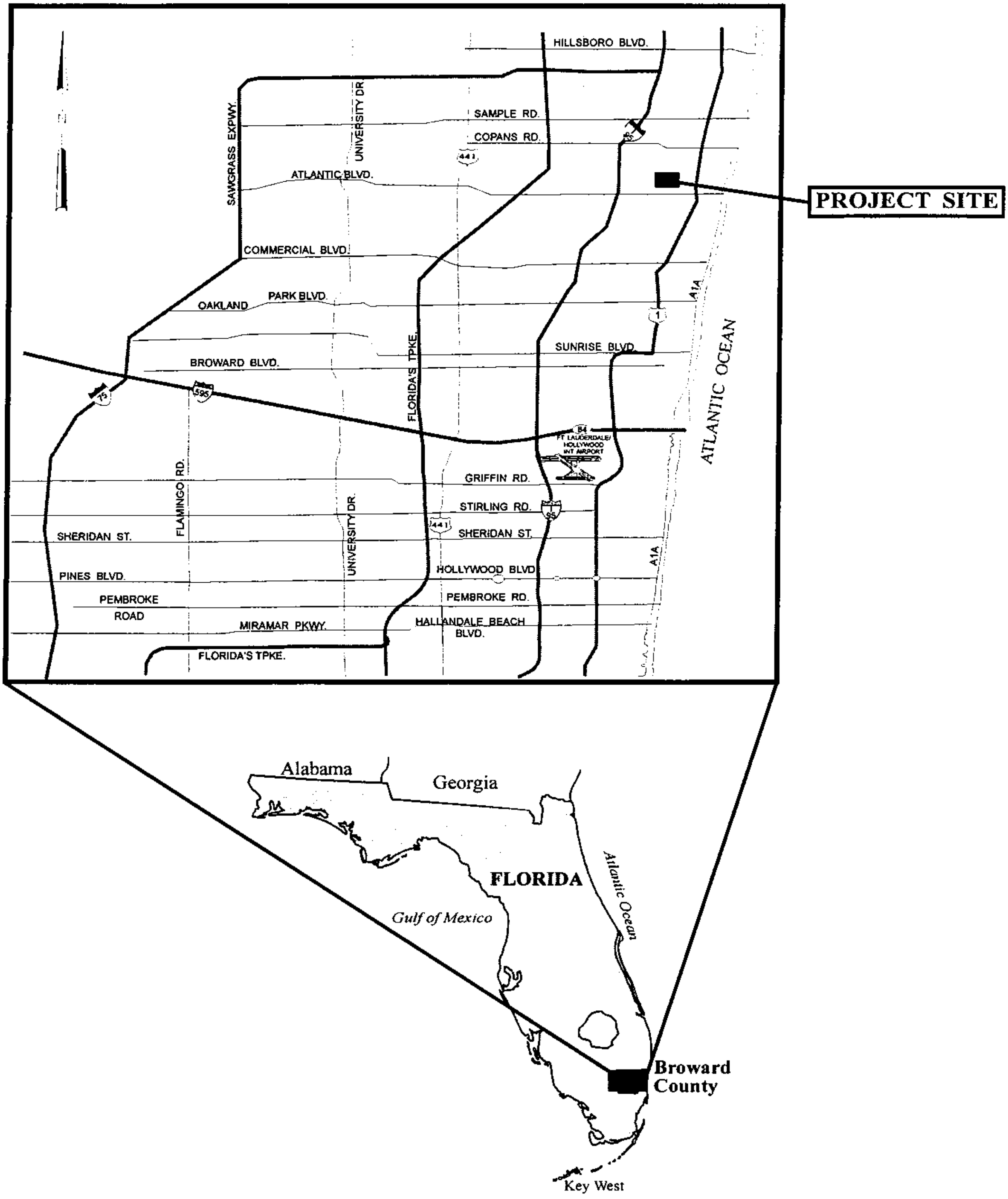
Interval (feet bpl)	Well	Ammonia (mg/L)	Chloride (mg/L)	Conductivity (umhos/cm)	Total Kjeldahl Nitrogen (mg/L)	TDS (mg/L)
1,519 – 1,550	IW–1	0.64	2,930	7,600	1.28	5,640
1,631 – 1,647	IW–1	0.26	17,000	40,200	0.23	28,100
1,679 – 1,695	IW–1	0.22	16,400	37,100	<0.25	29,900
1,731 – 1,747	IW–1	0.17	19,000	46,600	0.35	32,600
1,811 – 1,827	IW–1	0.09	20,000	48,800	0.33	35,100
1,861 – 1,877	IW–1	3.02	9,850	42,100	4.60	20,374
1,861 – 1,877	IW–1	4.02	9,840	32,000	4.97	20,200
1,931 – 1,947	IW–1	0.15	16,400	46,100	0.16	34,500

Table 6
Plugging and Abandonment Cost Estimate

Task	Unit Cost	Plan Estimate
Injection Well		
Mobilization	$20,000	$20,000
Mechanical Integrity Test (MIT)	$20,000	$20,000
Crushed Limestone		
4,000 cu ft	$10/cu ft	$40,000
Neat Cement		
10,000 cu ft	$10/cu ft	$100,000
20% Contingency		$36,000
TOTAL		$216,000
Dual Zone Monitor Well		
Mobilization	$10,000	$10,000
Neat Cement		
3,000 cu ft	$10/cu ft	$30,000
20% Contingency		$8,000
TOTAL		$48,000

FIGURES

40368 FIGURE-1.CDR



ALBERT MUNIZ, P.E.
Registration No. 35587

HAZEN AND SAWYER
Environmental Engineers & Scientists

CONCENTRATE DISPOSAL SYSTEM
POMPANO BEACH WTP

LOCATION MAP

FIGURE

1

SURVEY PLAT

OF INJECTION WELLS
LOCATED IN
BROWARD COUNTY, FLORIDA

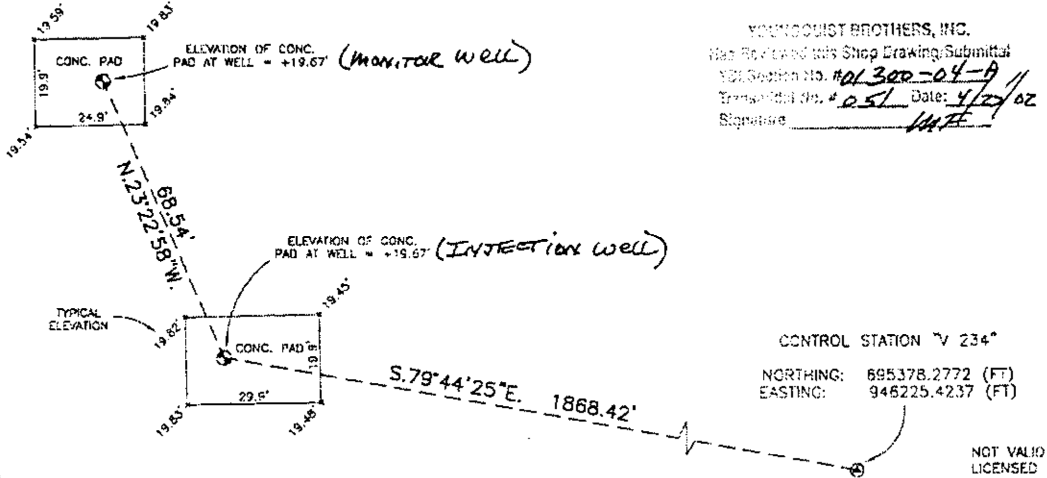
INJECTION WELL

NORTHING: 695773.97 (FT)
EASTING: 944359.66 (FT)

LATITUDE: N 26°14'42.569"
LONGITUDE: W 80°07'14.719"

THE COORDINATES SHOWN HEREON WERE BASED ON GPS REAL-TIME TIES TO "V 234" CONTROL STATION.

DESIGNATION – V 234
PID – AD2599
STATE/COUNTY – FL/BROWARD
USGS QUAD – POMPANO BEACH (1983)
NAD 83/90 GEOGRAPHIC COORDINATE – N 26°14'36.52405" W 080°06'54.25868"
NAD 83/90 STATE PLANE COORDINATE – FLORIDA EAST ZONE
NORTHING: 211,951.723 (MT)
EASTING: 288,410.086 (MT)



CONTROL STATION "V 234"

NORTHING: 695378.2772 (FT)
EASTING: 946225.4237 (FT)

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI Section No. #01300-04-A
Transmittal No. #051 Date: 4/23/02
Signature

INJECTION WELL

NORTHING: 695711.07 (FT)
EASTING: 944386.88 (FT)

LATITUDE: N 26°14'41.944"
LONGITUDE: W 80°07'14.425"

N

LEGEND:

FT. = FEET
MT. = METERS
CONC. = CONCRETE

PREPARED FOR:
YOUNGQUIST BROTHERS, INC.

NOTES:

THIS PLAT PREPARED AS A SPECIFIC PURPOSE SURVEY FOR THE PURPOSE OF LOCATING THE INJECTION WELLS AND CONCRETE PADS WITH ELEVATIONS.

BEARINGS AND COORDINATES SHOWN HEREON ARE STATE PLANE FOR THE FLORIDA EAST ZONE NAD 83/1990 ADJUSTMENT AND BASED ON GPS REAL-TIME TIES TO CONTROL STATION "V 234".

ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), FROM TIES TO CONTROL STATION "V 234" ELEVATION = +18.04'.

UNDERGROUND IMPROVEMENTS, UTILITIES AND/OR FOUNDATIONS WERE NOT LOCATED UNLESS OTHERWISE NOTED.

DATE OF LAST FIELD WORK: 4-17-2002

FOR THE FIRM:

Scott M. Shore
SCOTT M. SHORE
PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA CERTIFICATE NO. LS# 5743
DATE SIGNED: 4-22-2002

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

TITLE:
SPECIFIC PURPOSE SURVEY

MERIDIAN
SURVEYING & MAPPING, LLC
LAND SURVEYORS PLANNERS
LB# 7077

5245 RAMSEY WAY, SUITE #2
FORT MYERS, FLORIDA 33907
PHONE: (941) 275-8575
FAX: (941) 275-8457
www.meridianfl.com

FILE NAME:	FIELD BOOK/PAGE:	PROJECT NO.:	SHEET:
2784SR.DWG	54/02	2784	1 OF 1

SURVEY DATE:	DRAWN BY:	SCALE:	CHECKED BY:	FILE NO. (S-T-R)
4-17-2002	SMS	1" = 30'	TLM/SMS	

HAZEN AND SAWYER
Environmental Engineers & Scientists

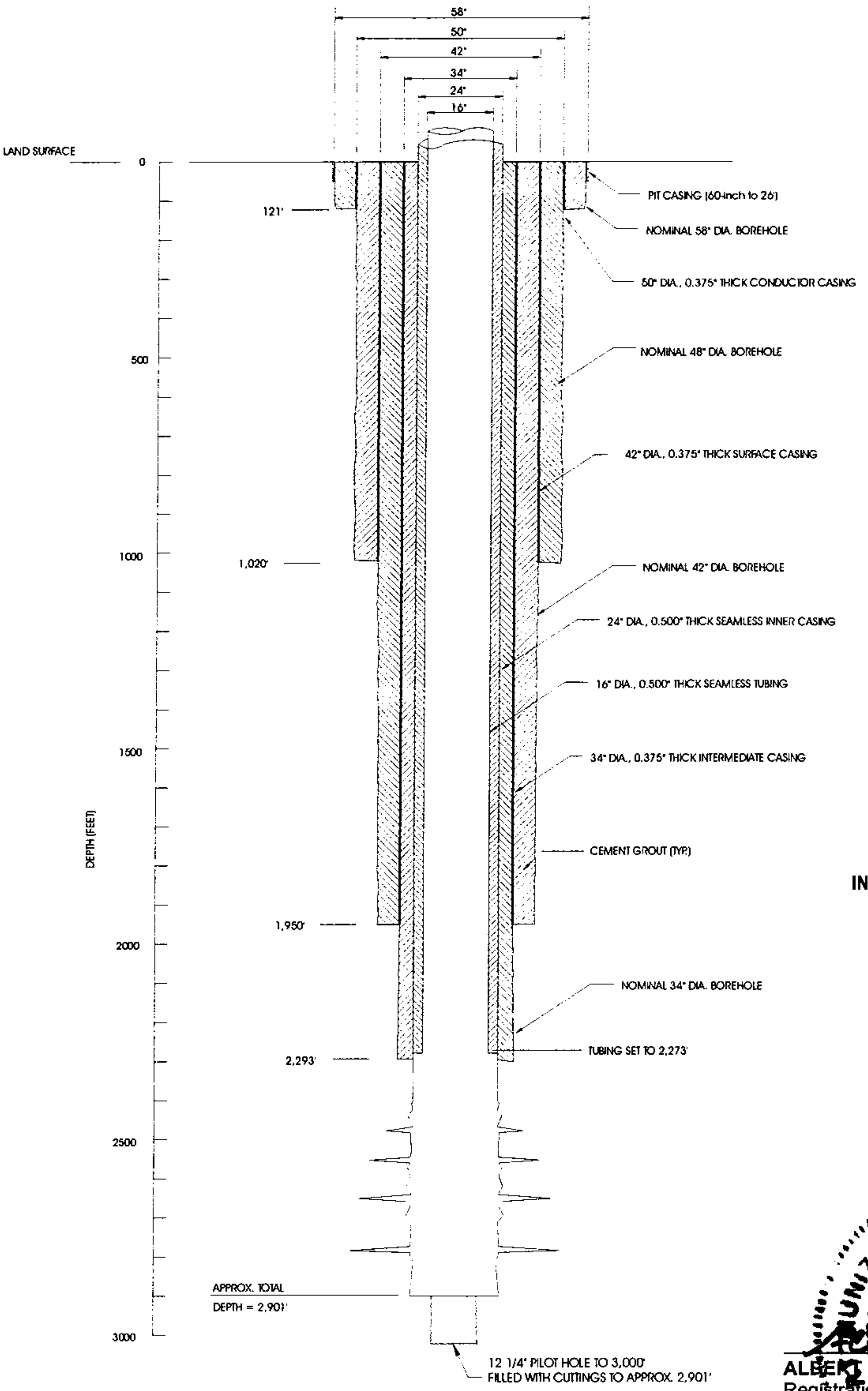
CONCENTRATE DISPOSAL SYSTEM
POMPANO BEACH WTP

WELL LOCATION AS-BUILT SITE PLAN

FIGURE
2

40368 FIGURE- 2.CDR

40340 FIGURE-3.CDR



INJECTION WELL (IW-1)

N.T.S.

Note: A nominal 34-inch bottom hole assembly, 24 feet in length was abandoned in the injection well. The assembly is believed to be substantially intact, with the top believed to be at 2,901 feet in depth.

ALBERT MUNIZ, P.E.
Registration No. 3[illegible]587

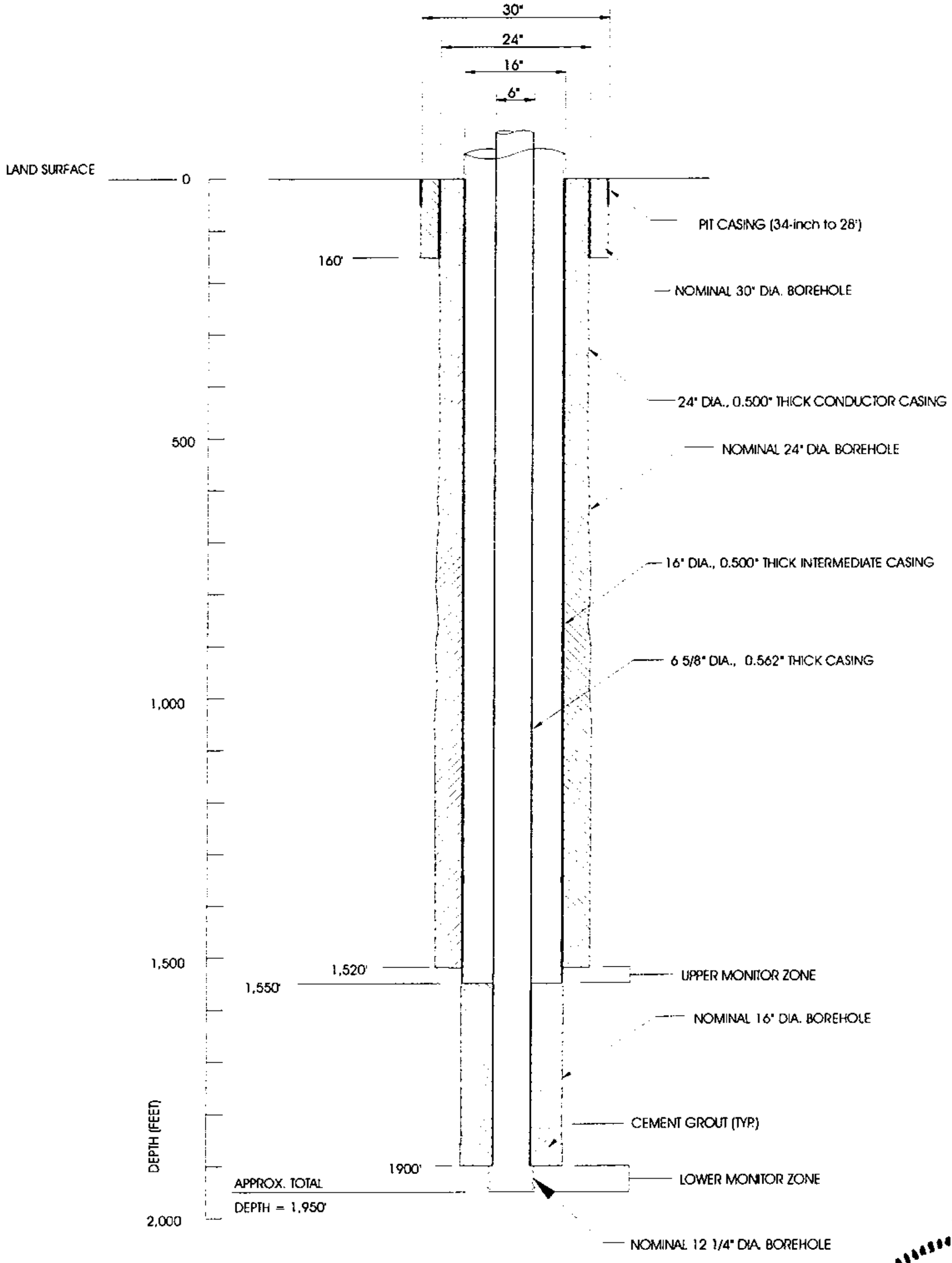
HAZEN AND SAWYER
Environmental Engineers & Scientists

CONCENTRATE DISPOSAL SYSTEM
POMPANO BEACH WTP

INJECTION WELL
AS-BUILT WELL PROFILE

FIGURE
3

40340 FIGURE-4.CDR



DUAL-ZONE MONITOR WELL (MW-1)

N.T.S.

ALBERT MUNIZ, P.E.
Registration No. 39587

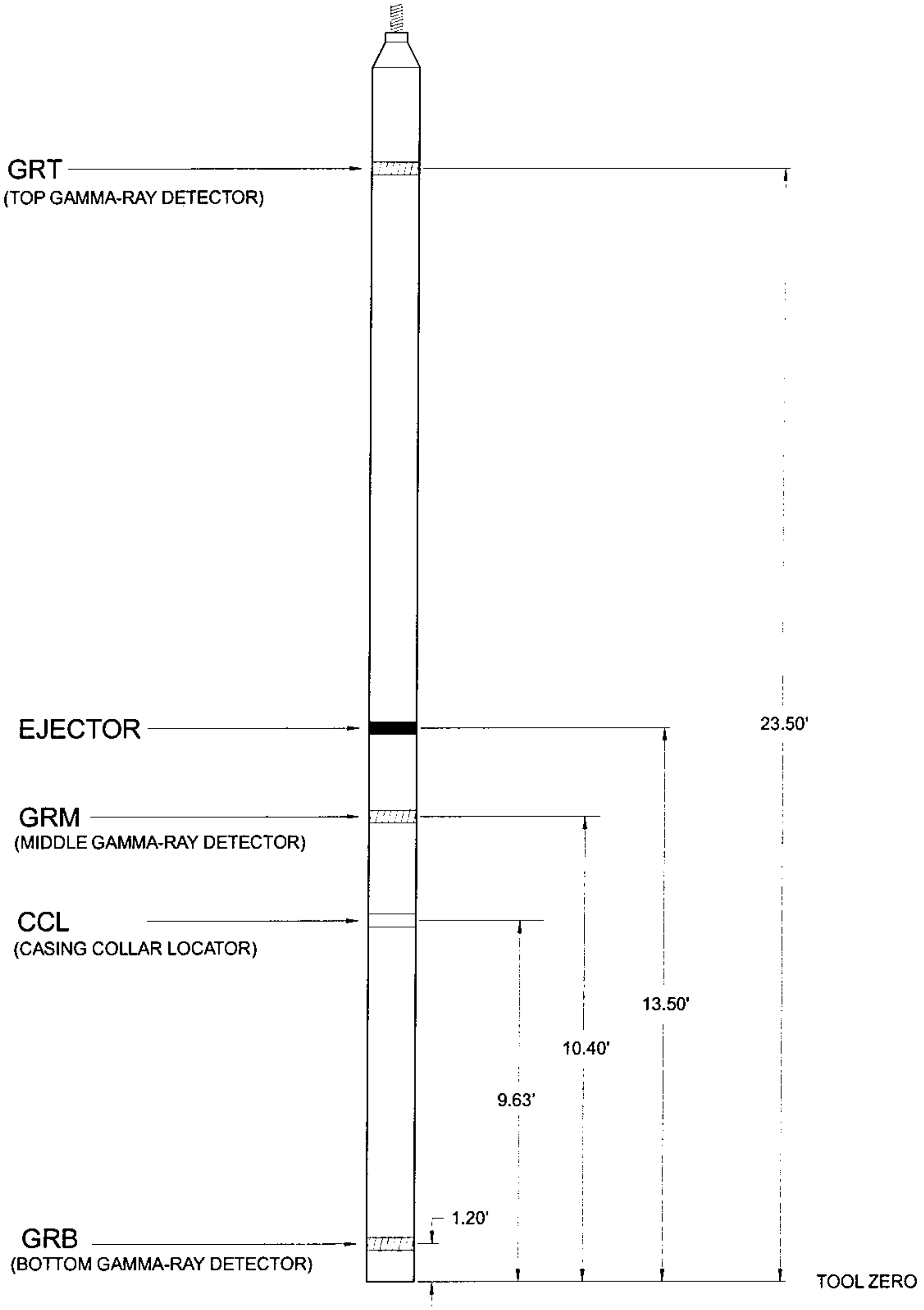
HAZEN AND SAWYER
Environmental Engineers & Scientists

CONCENTRATE DISPOSAL SYSTEM
POMPANO BEACH WTP

MONITOR WELL
AS-BUILT WELL PROFILE

FIGURE
4

40368 FIGURE- 5.CDR



HAZEN AND SAWYER
Environmental Engineers & Scientists

CITY OF POMPANO BEACH FLORIDA

CONCENTRATE DISPOSAL SYSTEM
POMPANO BEACH WTP

RADIOACTIVE TRACER SURVEY TOOL

FIGURE

5

APPENDIX A

FDEP CONSTRUCTION PERMIT

RECEIVED
HAZEN AND SAWYER, P.C.
Boca Raton, Florida

MAR 23 2001
40174 + 40368

JOB No.

Department of
Environmental Protection

Jeb Bush
Governor

Southeast District
P.O. Box 15425
West Palm Beach, Florida 33416

David B. Struhs
Secretary

NOTICE OF PERMIT

MAR 22 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Broward County
UIC – City of Pompano Beach WTP
File Number: 0167214 - 001 - UC

Mr. William F. Flaherty, P.E.,
Utilities Director
City of Pompano Beach
1201 N.E. 5th Avenue
Pompano Beach, Fl. 33060

Dear Mr. Flaherty:

Enclosed is Permit Number 0167214-001-UC, to construct the City of Pompano Beach Water Treatment Plant's (WTP) Class I Injection Well, IW-1, issued pursuant to Section(s) 403.087, Florida Statutes and Florida Administrative Codes 62-4, 62-520, 62-528, 62-550, 62-522, 62-600, 62-601 & 62-660.

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 thirty (30) days from the date this Notice is filed with the Clerk of the Department.

Should you have any questions, please contact Joe May, P.G. or Daniel C. Phelps, P.G., of this office, telephone (561) 681-6691 or (561) 681-6778, respectively.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Melissa L. Meeker — 3/22/01
Melissa L. Meeker — Date
Director of District Management
Southeast District

MLM/LH/JRM/DCP

Cc:
D.C. Phelps, FDEP/SED
Ron Reese, USGS/Mia.
Nancy March USEPA/Atl.
Pyara Wilkhu, FDEP/SED
Steve Anderson, SFWMD
Albert Muniz, Hazen and Sawyer
Richard Deuerling, FDEP/Tal.
Garth Hinckle, BCDPEP

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on MAR 2 2 2001 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

MAR 2 2 2001
Date

FLORIDA

Department of
Environmental Protection

Jeb Bush
Governor

Southeast District
P.O. Box 15425
West Palm Beach, Florida 33416

David B. Struhs
Secretary

PERMITTEE:
Mr. William F. Flaherty, P.E
Utilities Director
City of Pompano Beach
1201 N.E. 5th Avenue
Pompano Beach, Fl. 33060

ID. NUMBER:
PERMIT: 0167214-001-UC MAR 22 2001
DATE OF ISSUE:
EXPIRATION DATE: MAR 21 2006
COUNTY: Broward
LATITUDE/LONGITUDE: 26°14'38.29"N/80°07'12.15"W

PROJECT: Construction permit for City of Pompano Beach WTP Class I Injection Well System IW-1

This permit is issued under the provisions of Chapter 403.087, Florida Statutes, and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-528, 62-550, 62-522, 62-600, 62-601 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: One Class I Injection Well consisting of an internally coated 16-inch outside diameter (OD), 0.5-inch thick seamless steel tubing that will be fully cemented from land surface to an approximate depth of 2,980 feet below land surface (bls) inside a 24-inch diameter OD, 0.500-inch thick steel casing which will be cemented to an approximate depth of 3,000 ft. below land surface; for disposal and monitoring of up to 6.34 MGD (peak hour flow) of non-hazardous, membrane softening concentrate reject water via injection through an open hole interval between approximately 3,000 feet and the total depth of the well at approximately 3,500 feet. The injection interval is the "Boulder Zone" of the lower Oldsmar Formation. Injection Well IW-1 will be used as the primary disposal system for membrane softening concentrate reject water generated by the Water Treatment Plant. The confinement of the injection zone from overlying USDW aquifers is to be monitored by a dual zone monitoring well. Upon expansion of the capacity of the plant and approval by the Department the injection well may be operated at up to 7.93 MGD and 9.52 MGD, the maximum peak hour flows at 10 and 12 feet per second, per Chapter 62-528 F.A.C., allowed under normal operating conditions and during planned testing, maintenance, or emergency conditions respectively.

IN ACCORDANCE WITH: Application to construct received March 8, 2000, Request for Information (RFI-1) dated April 6, 2000, Response to RFI received May, 8, 2000, Requests for Information (RFI-2 and RFI-2b) dated May 28, 2000 and June 2, 2000, RFI response received June 22, 2000, Request for Information (RFI-3) dated July 20, 2000, RFI response received August 30, 2000, Request for Information (RFI-4) dated September 18, 2000, RFI response received September 22, 2000, Request for Information (RFI-5) dated October 10, 2000, RFI response received October 13, 2000, informal Approval of the Alternative Design dated November 13, 2000, Letter of Completeness dated November 15, 2000, formal Approval of the Alternative Design dated November 13, 2000, public notice of the Draft Permit published in the Sun-Sentinel newspaper on Sunday December 24, 2000, consideration of public comment received as a result of the public meeting held on February 2, 2001 at 10:00 AM, and public notice of the Intent to Issue Permit published in the Sun-Sentinel newspaper on February 18, 2001.

LOCATED AT: The City of Pompano Beach Water Treatment Plant at 1201, NE 5th Avenue, Pompano Beach, Florida.

TO SERVE: The City of Pompano Beach Water Treatment Plant as the primary means of disposal of membrane softening concentrate reject waters.

SUBJECT TO: General Conditions 1-25 and Specific Conditions 1-10.

PERMITTEE:
Mr. William F. Flaherty, P.E
Utilities Director - City of Pompano Beach
City of Pompano Beach WTP
PROJECT: Class I Injection Well System IW-1

ID. NUMBER:
PERMIT/CERTIFICATION NUMBER: 0167214-001-UC
DATE OF ISSUE: MAR 2 2 2001
EXPIRATION DATE: MAR 2 1 2006
COUNTY: Broward
LATITUDE/LONGITUDE: 26°14'38.29"N/80°07'12.15"W

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.

GENERAL CONDITIONS:

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 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:

      1) the date, exact place, and time of sampling or measurements;

2) the person responsible for performing the sampling or measurements;

3) the dates analyses were performed;

4) the person responsible for performing the analyses;

5) the analytical techniques or methods used;

6) 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 C.F.R. 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.

GENERAL CONDITIONS:

20. The permitee 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).

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

25. 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.

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PERMITTEE:
Mr. William F. Flaherty, P.E
Utilities Director - City of Pompano Beach
City of Pompano Beach WTP
PROJECT: Class I Injection Well System IW-1

ID. NUMBER:
PERMIT/CERTIFICATION NUMBER: 0167214-001-UC
DATE OF ISSUE: MAR 22 2001
EXPIRATION DATE: MAR 21 2006
COUNTY: Broward
LATITUDE/LONGITUDE: 26°14'38.29"N/80°07'12.15"W

SPECIFIC CONDITIONS:

1. General Requirements

   a. This permit is for construction of Class I injection well IW-1 and a dual zone monitor well MW-1. This permit does not authorize the construction of any other well or wells associated with the City of Pompano Beach Water Treatment Plant Injection Well System.

   b. The flow from the monitoring zones during well evacuation and sampling shall not be discharged to surface waters or the Underground Source of Drinking Water (USDW) aquifers. Measures shall be taken to insure that proper disposal of these waters occurs in compliance with local programs and Department rules.

   c. Reasonable precautions shall be taken to prevent contamination of the surficial aquifer due to spillage of formation and/or drilling fluids. Should the surficial aquifer be contaminated as a result of this modification, remediation of the surficial aquifer shall be the City's responsibility.

   d. In the event the well must be plugged and abandoned, the Permittee shall obtain an FDEP permit as required by Rule 62-528.460, F.A.C.

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

   f. The Permitee shall seek Department's approval, subsequent to the granting of operational testing approval, for the injection of reclaimed water under this permit as an emergency disposal option.

2. Site Requirements

   a. The measurement points for drilling and logging construction shall be surveyed and referenced to the National Geodetic Vertical Datum (NGVD) of 1983 prior to the onset of drilling activities for this injection well system.

   b. The injection well shall be surveyed for latitude and longitude and submitted on a site plan prior to commencement of construction activities.

   c. A drilling and system construction schedule shall be submitted to the Department, TAC, and EPA prior to site preparation for the injection well system.

   d. Permanent surficial aquifer wells identified as Pad Monitor Wells (PMWs) shall be located at the corners of the injection well drilling pad and identified by location number and pad location, i.e. N.W., N.E, S.W., and S.E.

      1) These wells shall be sampled and analyzed prior to the onset of drilling for chlorides (mg/L), conductivity (umho/cm), temperature, total dissolved solids (mg/L), and water level (relative to NGVD). Initial analyses must be submitted prior to the initiation of work on the Class I injection well.

2) These wells are to be retained in service, sampled weekly for the above parameters during the construction phase and quarterly thereafter.

3) If located in a traffic area the well heads must be protected by a traffic bearing enclosure and cover. Individual covers must be specifically marked to identify the well and its purpose. A copy of the FDEP Southeast District Summary Sheet is attached for your use when reporting the above information.

3. Construction and Testing Requirements

   a. The Department shall be notified within forty-eight (48) hours after work has commenced.

   b. A revised set of contract documents, that include this permit and approved specification changes documented in all responses to requests for information (RFI's), shall be submitted to the Department, TAC, and EPA prior to construction.

   c. Blow-out preventers or the equivalent shall be installed on the respective wells prior to penetration of the Floridan Aquifer System.

   d. Hurricane Preparedness-Upon the issuance of a "Hurricane Watch" by the National Weather Service, the preparations to be made include but are not limited to the following:

      1) Secure all on-site salt and stockpiled additive materials to prevent surface and/or groundwater 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.

   e. The geophysical logging program to be accomplished during construction of the injection well will, at a minimum, include:

      1) Prior to setting the 42-inch casing: geophysical logs (caliper, gamma ray, Dual Induction) to confirm the base of the Hawthorn Group (approximately 1,000 feet below land surface), and to establish a mechanically secure casing-setting depth.

      2) To determine the 34-inch casing depth: Pilot hole geophysical logs (caliper, gamma ray, Dual Induction, borehole compensated sonic, borehole televiewer or television survey, pumping flowmeter, temperature, and fluid resistivity). These logs will be used for stratigraphic correlation, identification of confining units, and identification of producing intervals.

      3) To determine the final casing depth: Pilot hole geophysical logs (caliper, gamma ray, Dual Induction, borehole compensated sonic, borehole televiewer or television survey, pumping flowmeter, temperature, and fluid resistivity). These logs will be used for stratigraphic correlation, identification of confining units, and identification of producing intervals.

SPECIFIC CONDITIONS:

4) In the injection zone beneath the final casing, the following geophysical logs will be run: caliper, gamma ray, Dual Induction, borehole compensated sonic, borehole televiewer or television survey, pumping flowmeter, temperature, and fluid resistivity.

5) Caliper logs shall be run on all reamed holes.

6) Temperature logs shall be run after all cement stages that are completed without positive return at the surface, to identify cement top.

f. Packer testing will be completed to determine water quality and evaluate formations, and will at minimum include the following:

1) Shall be conducted below the base of the USDW to the top of the proposed injection horizon.

2) Water samples shall be collected from each packer test, and analyzed for TDS, chlorides, specific conductivity, NH3 and total kjeldahl nitrogen (TKN). A five (5) gallon sample of formation fluid shall be collected at the end of each test for which a background sample unaffected by injection can be obtained. Samples should be labeled as to well number, depth, type of sample and shipped to Dr. James Cowart, Department of Geology, Florida State University, Tallahassee, FL 32304.

g. The depth of the 10,000 mg\L total dissolved solids (TDS) interface shall be confirmed during drilling and testing. This shall be accomplished, interpreted, and analyzed by the following:

1) Water samples from packer tests

2) Geophysical logging upon reaching the total depth of the appropriate pilot hole interval using these logs: caliper, gamma ray, Dual Induction, borehole compensated sonic, pumping flowmeter, temperature, and fluid resistivity.

3) Plots of sonic porosity and apparent formation fluid resistivity (RWA). Interpretation will include the calculation of sonic porosity and RWA, and provide the input parameters used.

h. Confinement, at a minimum, shall be confirmed using directly measured lithologic properties, geophysical evidence, and tests performed while pumping the formation.

1) Formation pumping tests shall include flow meter logs, packer tests, water quality sampling during packer tests, and analysis of drawdown curves measured during packer tests.

2) For the purpose of confirming confinement, flow meter, temperature and fluid resistivity logs shall be run under pumping conditions in the pilot hole from the base of the surface casing to the potential confining unit immediately prior to the intersection of the top of the injection interval, so that the permeability of the zones within the base of the potential confining intervals can be evaluated.

3) Other geophysical logs will be used as indirect evidence to deduce or correlate formation properties measured in pumping tests and direct lithologic sample analysis.

SPECIFIC CONDITIONS:

4) Lithologic properties measured in laboratory analyses of core samples shall include: Hydraulic conductivity (vertical and horizontal), Young's modulus/elastic modulus, formation factor, and Archie's cementation exponent and coefficient.

i. Mechanical Integrity:

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

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

3) 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 4. below.

4) The Department shall allow the permittee to continue operation of a well that lacks mechanical integrity if the permittee has made a satisfactory demonstration that fluid movement into or between underground sources of drinking water is not occurring.

5) Mechanical integrity of the injection well shall be determined pursuant to Rule 62-528.300 (6), (b)2, and (c), F.A.C.

   a) The pressure test for the final casing shall be accepted if tested with a liquid filled casing at 1.5 times the expected maximum (sustained) operating pressure with a test tolerance of not greater than or equal to 5%.

   b) Verification of pressure gauge calibration must be provided to the Department representative at the time of the test and in the certified test report.

j. The interim internal mechanical test to be conducted half way between the standard 5 year mechanical integrity tests will consist of a pressure test pursuant to Rule 62-528.300(6)(b)2., F.A.C. as further specified in specific condition i. 5) a) and b) above. Department approval and TAC and EPA review of the interim mechanical integrity testing plan is required prior to its implementation.

k. Department approval and TAC and EPA review pursuant to Chapter 62-528 F.A.C. is required for the following stages of construction:

1) Intermediate injection well casing seat selection.

2) Final injection well casing seat.

SPECIFIC CONDITIONS:

3) Proposed cementing procedures (cement volumes, no. of stages,) for the deep intermediate (34-inch) and final (24-inch) casing must be submitted with the caliper logs (reamed sections) for Department approval and TAC and EPA review.

4) Proposed cementing procedures (cement volumes, no. of stages,) for the cementing in of the injection tubing must be presented for Department approval and TAC and EPA review.

5) Injection testing.

l. TAC meetings are scheduled on the second (2nd) and 4th Tuesday of each month subject to a five (5) working day prior notice and timely receipt of critical data by all TAC members. Emergency meetings may be arranged to avoid undue construction delays.

m. Department approval at a scheduled TAC meeting shall be based on the permittee's presentation that shows compliance with the rules and this permit.

n. The confinement of the injection zone in the injection well system from overlying aquifers is to be monitored by a dual zone monitor well and a regular monitoring program.

4. Quality Assurance/Quality Control Requirements

a. Pursuant to Rule 62-528.440(5)(b) Florida Administrative Code (F.A.C.), the Professional Engineer(s) of Record shall certify all documents related to the completion of the Class I injection well system as a disposal facility. The Department shall be notified immediately of any change of the Engineer(s) of Record.

b. All documents prepared for the geological/hydrogeological evaluation of this 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, casing installation and cementing operations, and pilot hole water quality sampling.

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

e. 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.

5. Reporting Requirements

a. All reports and surveys required by this permit shall be submitted concurrently to all the members of the Technical Advisory Committee and the United States Environmental Protection Agency USEPA), Region IV, Atlanta. The Technical Advisory Committee (TAC) shall consist of representatives from these agencies:

Department of Environmental Protection, West Palm Beach and Tallahassee
United States Geological Survey, Miami
South Florida Water Management District, West Palm Beach
Broward County Department of Planning and Environmental Protection

b. The Department and other applicable agencies must be notified immediately, within twenty-four (24) hours of any unusual 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).

1) Notification shall be made in person, by telephone, or telegraph within 24 hours of event to the Department's Southeast District office.

2) A written report describing the incident shall also be given to the Department within seventy-two (72) hours of the start of the event.

3) In addition, a final written report shall be submitted to the Department within two (2) weeks of the event. The final report shall contain a complete description of the occurrence of the event, discuss its cause(s), and the steps being taken to prevent reoccurrence of the event.

c. The Department shall be notified at least seventy-two (72) hours prior to all testing for mechanical integrity.

d. All testing for mechanical integrity must be initiated during daylight hours, Monday through Friday.

e. An interim internal mechanical integrity test shall be conducted 2.5 years after the full mechanical integrity test referenced in specific condition 3 i. above. This test shall be conducted as specified in specific condition 3.j above.

f. A weekly submittal of construction progress reports covering the previous 7 day period shall be mailed every Friday. This report shall include at a minimum the following information:

1) A cover letter summary of the daily engineer report, work log and a projection for activities in the next reporting period.

2) Daily engineers report and work log with detailed descriptions of all testing, logging, and casing installation activities.

3) Driller's log.

SPECIFIC CONDITIONS:

4) Detailed description of any unusual construction-related events that occur during the reporting period.

5) Weekly water quality analysis and water levels for the drilling pad monitor wells. (See S.C. 2.d. 1 above)

6) A certified evaluation of all logging and test results must be submitted with test data.

7) Description of the formations encountered.

8) Details of cementing operations including the following information, for each stage of cement: cement slurry composition, specific gravity, pumping rate, volume of cement pumped, theoretical fill depth, actual tag depth and from, both the physical tag and the geophysical logs, a percent fill, and an explanation of any variation between actual versus theoretical fill. For each casing : Laboratory analysis of dry cement composition of a sample taken during the neat cement stage emplaced at the base of each casing.

g. Upon completion of analysis of cores and sample cuttings recovered during the installation of the injection well, the Permittee will contact the Underground Injection Control Section of the Department of Environmental Protection in Tallahassee to arrange their transfer to the Florida State Geologic Survey.

h. Casing seat recommendation shall include technical justification utilizing the following information:

1) Geophysical logs with interpretations
2) Water quality data
3) Identification of confining units with interpretations
4) Casing depth evaluation (mechanically secure formation, potential for grout seal).
5) Identification of the base of the USDW using water quality, RWA plots, and log interpretations

i. Injection test request shall contain the following justifications:

1) Radioactive tracer test results
2) Cement bond logs and interpretation
3) Final downhole TV survey and interpretation
4) Demonstration of mechanical integrity
5) Demonstration of confinement
6) Water quality analysis of injection fluid from every source

j. The radioactive tracer testing request shall contain a description of source and quantity of water to be used to create a buoyant bubble in the injection zone.

k. A final report of the construction of the injection well, pursuant to 62-528.430(1)(e) F.A.C. shall be submitted no later than one hundred and twenty (120) days after commencement of operational testing. This report shall include, at a minimum, definitions of the injection interval, all relevant confining beds, the depth of the base of the USDW and all monitor zones, including all relevant data and interpretations.

6. Operational Testing Requirements

   a. Prior to operational testing, the permittee shall comply with the requirements of Rule 62-528.450(3)(a),(b), and (c), F.A.C. No injection shall be allowed without authorization from the Department.

   b. The operational testing of the Class I injection well system under this permit shall not commence without written authorization from the Department.

   c. Prior to operational testing approval, the following items must be submitted for TAC review and Department approval:

      1) Certification of completion of well construction including as-built well construction drawings and specifications. The well construction drawings shall include a geologic stratigraphic cross section depicting the corresponding formations, the base of the USDW, and the boundaries of the confining and injection zone intervals.

      2) Results of the short term injection test with interpretation of the data. This test should be conducted for a minimum of twelve (12) hours at the maximum rate at which the well is to be permitted. Pressure/water level data from the injection well and both monitor zones shall be recorded continuously for at least twenty four (24) hours before the test and at least twelve (12) hours following the test. A detailed plan for this testing will be provided for UIC-TAC and USEPA review and Department approval prior to actual testing.

      3) A copy of the final television survey with interpretation.

      4) Geophysical logs with interpretations.

      5) Certification of mechanical integrity and interpreted test data.

      6) A description of the actual injection procedure including the anticipated maximum pressure and flow rate at which the well will be operated.

      7) 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.

      8) Surface equipment (including pumping station, piping, and appurtenances) completion certified by the engineer of record.

SPECIFIC CONDITIONS:

9) Signed and sealed record "as-built" engineering drawings of the injection well system including the pump station, surface piping, appurtenances and equipment.

10) The well location must be surveyed by a Florida registered land surveyor for latitude and longitude and submitted on a site plan.

11) Draft operating and maintenance manual with emergency discharge management plan procedures. The emergency discharge system must be fully constructed and ready to operate prior to approval of operational testing.

12) Receipt and Departmental approval of the demonstration of confinement prepared providing confirmation of confinement and defining the injection and confining sequences utilizing data collected during the drilling, logging and testing of the injection well. The report shall include the results of hydraulic testing (permeability, porosity, etc.) on the cores from the confining interval. Please note that this report, prepared by a Florida Registered Professional Geologist or appropriately experienced Professional Engineer, shall be reviewed and updated as appropriate after the completion of any additional injection/monitor well pairs in the future.

13) Wastestream analysis for primary and secondary drinking water standards and minimum criteria parameters as attached.

d. Prior to the authorization of operational testing by the Department, the Permittee will contact the Underground Injection Control Section of the Department, Southeast District, to arrange a site inspection. The inspection will determine if all equipment necessary to operate and monitor the injection well in compliance with the permit and Department rules has been installed. During the inspection, emergency procedures and reporting requirements shall be reviewed.

e. Upon receipt of written authorization from the Department (S.C.6.b. above), the operational testing of the injection well system shall be subject to the following conditions:

1) The progress of the operational testing for the system shall extend for a six (6) month period and shall be reviewed during TAC meetings scheduled at least every three (3) months after operation has begun. Reports evaluating the system's progress must be submitted to each member of the TAC at least two (2) weeks prior to the scheduled meeting. The conditions for the operation testing period may be modified by the Department at each of these TAC review intervals.

2) At no time shall hazardous waste or any fluids not specifically authorized by this permit be injected into this well.

3) The flows to the injection well shall be monitored and controlled at all times to ensure the maximum pressure on the wellhead does not exceed sixty six (66) % of the tested pressure on the tubing and packer assembly and that the flow down the well does not exceed 6.34 MGD, the present capacity of the plant, except during planned testing, maintenance, or emergency conditions. Upon expansion of the capacity of the plant and approval by the Department the well may be operated at up to 7.93 MGD, peak hour flow at 10 feet per second, under normal operating conditions and 9.52 MGD, peak hour flow at 12 feet per second, during planned testing, maintenance, or emergency conditions. The well velocity shall not exceed 12 ft/sec under any circumstances — and shall not exceed 10 ft/sec without written authorization from the Department.

PERMITTEE:
Mr. William F. Flaherty, P.E
Utilities Director - City of Pompano Beach
City of Pompano Beach WTP
PROJECT: Class I Injection Well System IW-1

ID. NUMBER:
PERMIT/CERTIFICATION NUMBER: 0167214-001-UC
DATE OF ISSUE: 2 2001
EXPIRATION DATE: MAR 1 2006
COUNTY: Broward
LATITUDE/LONGITUDE: 26°14'38.29"N/80°07'12.15"W

SPECIFIC CONDITIONS:

4) The injection well system must be monitored by continuous indicating, recording and totalizing devices for injectate flow rate and volume, injection pressure, and monitor zone pressure. All gauges and recording devices must be maintained in good operating condition and calibrated semi-annually at a minimum. The monitoring zone pressures or feet of head are to be referenced to NGVD and the monthly monitoring report shall indicate that pressures or feet of head are relative to NGVD.

5) The permitee shall notify the Department and obtain approval prior to any well work involving the removal of the well head or its main components or modification of the injection system, except in an emergency situation in which human health or property are at risk.

6) Any failure of the Class I injection well monitoring and recording equipment for a period of more than forty-eight (48) hours shall be reported immediately, within twenty-four (24) hours, to the Department. An interim written report describing the incident shall also be given to the Department within seventy-two (72) hours of the notification of the event. In addition, a final written report shall be sent to the Department within two (2) weeks of the event. The final report shall contain a complete description of the occurrence, discuss 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.

7) The following injection well performance and monitoring zone data shall be recorded for the monitoring zones and the injection wells as indicated and reported to the Department in a Monthly Operating Report (MOR):

a) Injection well performance:

(1) Physical characteristics of the wastestream:

(a) Pressure:

* injection pressure, daily average (psig)
* sustained (15 min.) injection pressure, daily max. (psig)
* sustained (15 min.) injection pressure, daily min. (psig)
* injection pressure, monthly average (psig)
* sustained (15 min.) injection pressure, monthly max. (psig)
* sustained (15 min.) injection pressure, monthly min. (psig)
* monthly wellhead pressure with no flow(shut in) (psig)

(b) Volume:

* monthly average daily flow volume (MG
* monthly max. of daily flow volume (MG)
* monthly min. of daily flow volume (MG))
* total monthly flow volume to injection well (MG)
* total monthly flow volume to injection well (MG) from the municipal wastewater stream
* total monthly flow volume to injection well (MG) from the reverse osmosis concentrate reject water stream
* total daily flow volume to injection well (MG)

(c) Rate:

* average daily flow rate to injection well (MGD)
* maximum daily sustained (15 min.) flow rate to injection well (MGD)
* minimum daily sustained (15 min.) flow rate to injection well (MGD)
* monthly average daily flow rate to injection well (MGD)
* monthly maximum daily sustained (15 min.) flow rate to injection well (MGD)
* monthly maximum peak hour flow (MGD)
* monthly minimum daily sustained flow rate to injection well (MGD)

(2) Chemical characteristics of the total wastestream monthly:

* carbon, total as C (TOC, mg/L)
* chloride (mg/L)
* fluoride, dissolved (mg/L)
* nitrogen, ammonia, total as N (mg/L)
* nitrogen, total kjeldahl nitrogen as N (TKN, mg/L)
* nitrogen, nitrate, total as N (mg/L)
* pH (standard units)
* phosphorous, total as P (mg/L)
* residue, total filterable (TDS, mg/L)
* specific conductance (temperature compensated, umho/cm)
* sulfate, total as S04 (mg/L)
* temperature (°C)
* total suspended solids (TSS, mg/L)

(3) Chemical characteristics of the total wastestream monthly during operational testing and quarterly there after:

* hardness, Ca calculated (mg/L)
* hardness, Ca & Mg calculated (mg/L)
* hardness, total as CaCO3 (mg/L)
* iron (mg/L)
* gross alpha (pCi/L)

(4) Per the discretionary provisions of 62-520.440 FAC, if sampling for gross alpha particle activity, shows a response of 15 pioCuries per liter or greater — monthly sampling for the following chemical characteristics shall be implemented until a full 3 months of data shows that gross alpha has declined to below the threshold value:

* gross alpha (pCi/L)
* radium 226 (pCi/L)
* radium 228 (pCi/L)

b) Monitor well performance:

(1) Physical characteristics - upper and lower monitor zones potentiometric surface height relative to NGVD (feet of head) or pressure (psig) referenced to NGVD

* daily maximum sustained pressure (ft. NGVD or psig)
* daily minimum sustained pressure (ft. NGVD or psig)
* daily average pressure (ft. NGVD or psig)
* monthly maximum sustained pressure (ft. NGVD or psig)
* monthly minimum sustained pressure (ft. NGVD or psig)
* monthly average pressure (ft. NGVD or psig)

(2) Chemical characteristics of the monitoring zones (to be sampled weekly):

* carbon, total as C (TOC, mg/L)
* chloride (mg/L)
* fluoride, dissolved (mg/L)
* nitrogen, ammonia, total as N (mg/L)
* nitrogen, total kjeldahl nitrogen as N (TKN, mg/L)
* nitrogen, nitrate, total as N (mg/L)
* pH (standard units)
* phosphorous, total as P (mg/L)
* residue, total filterable (TDS, mg/L)
* specific conductance (temperature compensated, umho/cm)
* sulfate, total as S04 (mg/L)
* temperature (°C)

SPECIFIC CONDITIONS:

(3) Chemical characteristics of the lower monitoring zone (to be sampled monthly):

* hardness, Ca calculated (mg/L)
* hardness, Ca & Mg calculated (mg/L)
* hardness, total as CaCO3 (mg/L)
* iron (mg/L)
* gross alpha (pCi/L)

(4) Per the discretionary provisions of 62-520.440 FAC, if sampling for gross alpha particle activity, shows a response of 15 picoCuries per liter or greater — monthly sampling for the following chemical characteristics shall be implemented until a full 3 months of data shows that gross alpha has declined to below the threshold value:

* gross alpha (pCi/L)
* radium 226 (pCi/L)
* radium 228 (pCi/L)

f. Weekly sampling for chemical characteristics and monthly sampling for hardness, iron, gross alpha as described above will be continued for a minimum of four (4) months. At that point the Permittee may submit data for TAC and EPA 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 and quarterly respectively.

g. A minimum of three (3) well volumes of fluid shall be evacuated from the monitor system prior to sampling for the chemical parameters listed above. All samples shall be analyzed by a state-certified laboratory. Sufficient purging shall have occurred when either of the following have occurred:

1) 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

2) upon purging the fifth well volume.

h. All required data submissions, including Monthly Operating Reports (MOR's), shall be clearly identified on each page with Facility Name, ID. Number, date of sampling/recording, operator's name, license and telephone number, and type of data shown (monitor zones will be identified by monitor well number and depth interval). The lead plant operator or higher official must sign and date each submittal. A copy of the Southeast District, UIC Section, MOR summary sheet is attached for your use.

i. The permitee shall submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the last day of the month immediately following the month of record. The results shall be sent to the Department of Environmental Protection, Southeast District Office, 400 N. Congress Avenue, P.O. Box 15425, West Palm Beach, FL 33416. 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.

j. A qualified representative of the Engineer of Record must be present for the start-up operations.

k. The Department must be notified in writing of the date of start-up of operations.

SPECIFIC CONDITIONS:

l. A controlled monthly test of well injectivity (rate/pressure) shall be conducted in accordance with Rule 62-528.430(2)(c), F.A.C., with at least three (3) specified injection flow rates. The high rate should approach maximum design flow. The following data shall be recorded and reported at each injection rate:

   * injection flow rate (MGD)
   * injection pressure (psig)
   * wellhead pressure with no flow (shut-in pressure in psig)
   * monitor zone pressures (psig)

   All readings shall be taken after a minimum five (5) minute period of stabilized flow.

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

m. Individual wastestream analysis (24 hour composite sample) for the reverse osmosis concentrate reject water waste stream for primary and secondary drinking water standards and minimum criteria (Chapter 62-550, F.A.C.) must be submitted annually (sampled in February and submitted in April).

7. Surface Equipment

a. The integrity of the monitor zone sampling system 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 insure that samples are properly identified by monitor 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, reliability and flexibility in the event of damage to the well and injectate piping. A regular program of exercising the valves integral to the well head shall be instituted. At a minimum, all valves integral to the well head shall be exercised during the regularly scheduled monthly injectivity testing.

c. The injection well and monitoring 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 and directed to a sump pump which in turn discharges to the pumping station wet well or via other approved means to the injection well system.

e. The injection well construction pad with impermeable perimeter retaining wall shall be maintained and retained in service for the life of the injection well. The injection and monitoring 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.

f. The surficial aquifer monitor wells installed at the corners of the injection well pad shall be secured, maintained, and retained in service.

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 review annually the plugging and abandonment cost estimates. An increase of ten (10) percent or more over the cost estimate upon which financial responsibility is based shall require the Permittee to submit documentation to obtain an updated Certificate of Demonstration of Financial Responsibility.

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 fourteen (14) days of such invalidation. The Permittee shall then within thirty (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. Signatories and Certification

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."

PERMITTEE:
Mr. William F. Flaherty, P.E
Utilities Director - City of Pompano Beach
City of Pompano Beach WTP
PROJECT: Class I Injection Well System IW-1

ID. NUMBER:
PERMIT/CERTIFICATION NUMBER: 0167214-001-UC
DATE OF ISSUE: MAR 2 2001
EXPIRATION DATE: MAR 21 2006
COUNTY: Broward
LATITUDE/LONGITUDE: 26°14'38.29"N/80°07'12.15"W

SPECIFIC CONDITIONS:

10. 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 EPA review and Department approval prior to implementation.

    c. The alternate disposal method approved by the Department as a part of this permit shall be maintained in working order at all times.

    d. 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 twenty-four (24) hours of the incident. A written report describing the incident shall also be submitted to the Department within five (5) days of the start of the incident. The written report shall contain a complete description of and discuss the cause of the emergency and/or discharge, 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.

Issued this 22nd day of March, 2001

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Melissa L Meeker 3/22/01
Melissa L. Meeker Date
Director of District Management
Southeast District

MLM/LH/JRM/DCP DCP

APPENDIX B

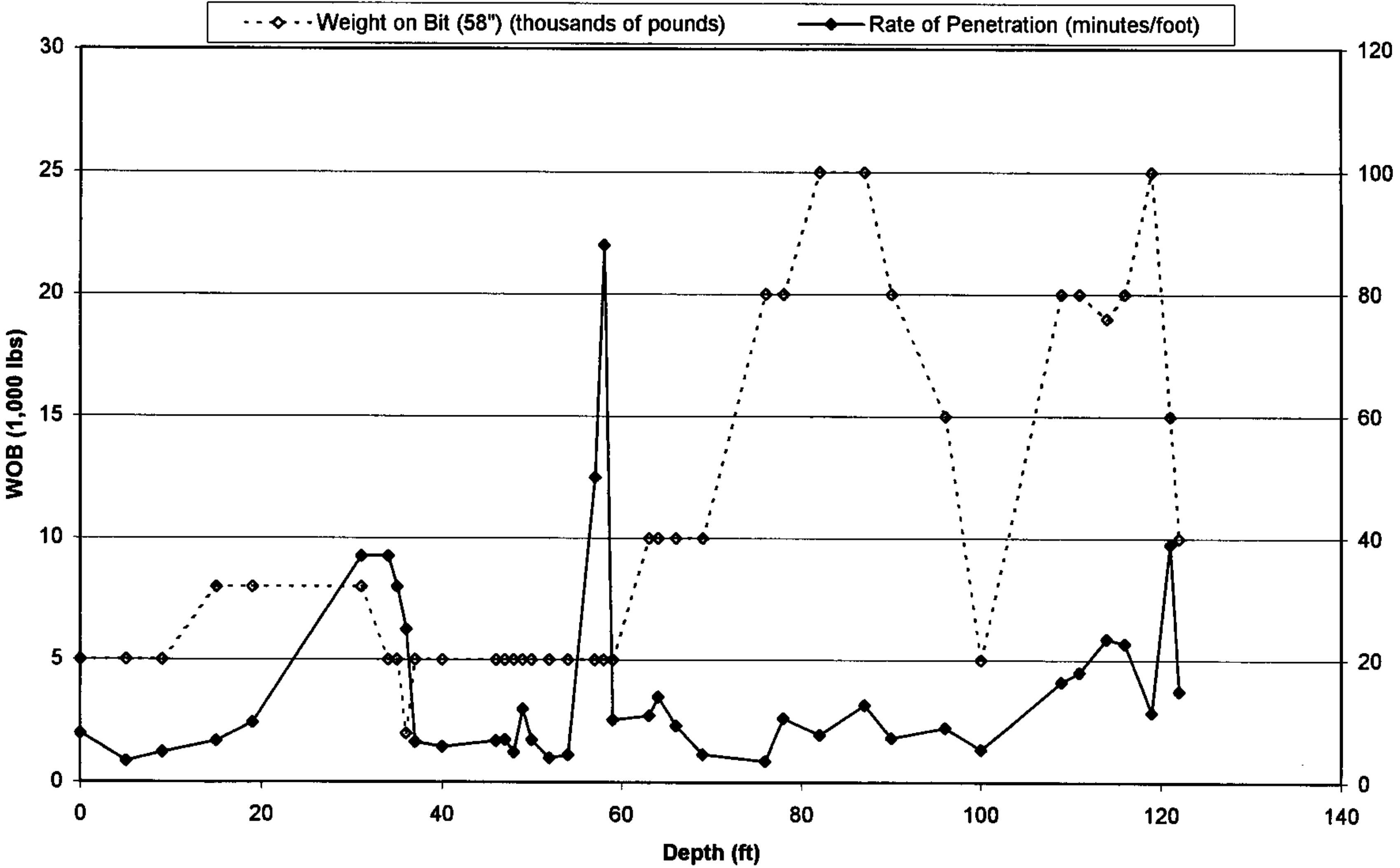
WEIGHT ON BIT AND RATE OF PENETRATION

Injection Well

City of Pompano Beach Concentrate Disopsal Well W-1

Weight on Bit / Rate of Penetration

58-inch Diameter Borehole 0 to 123 Feet BPL

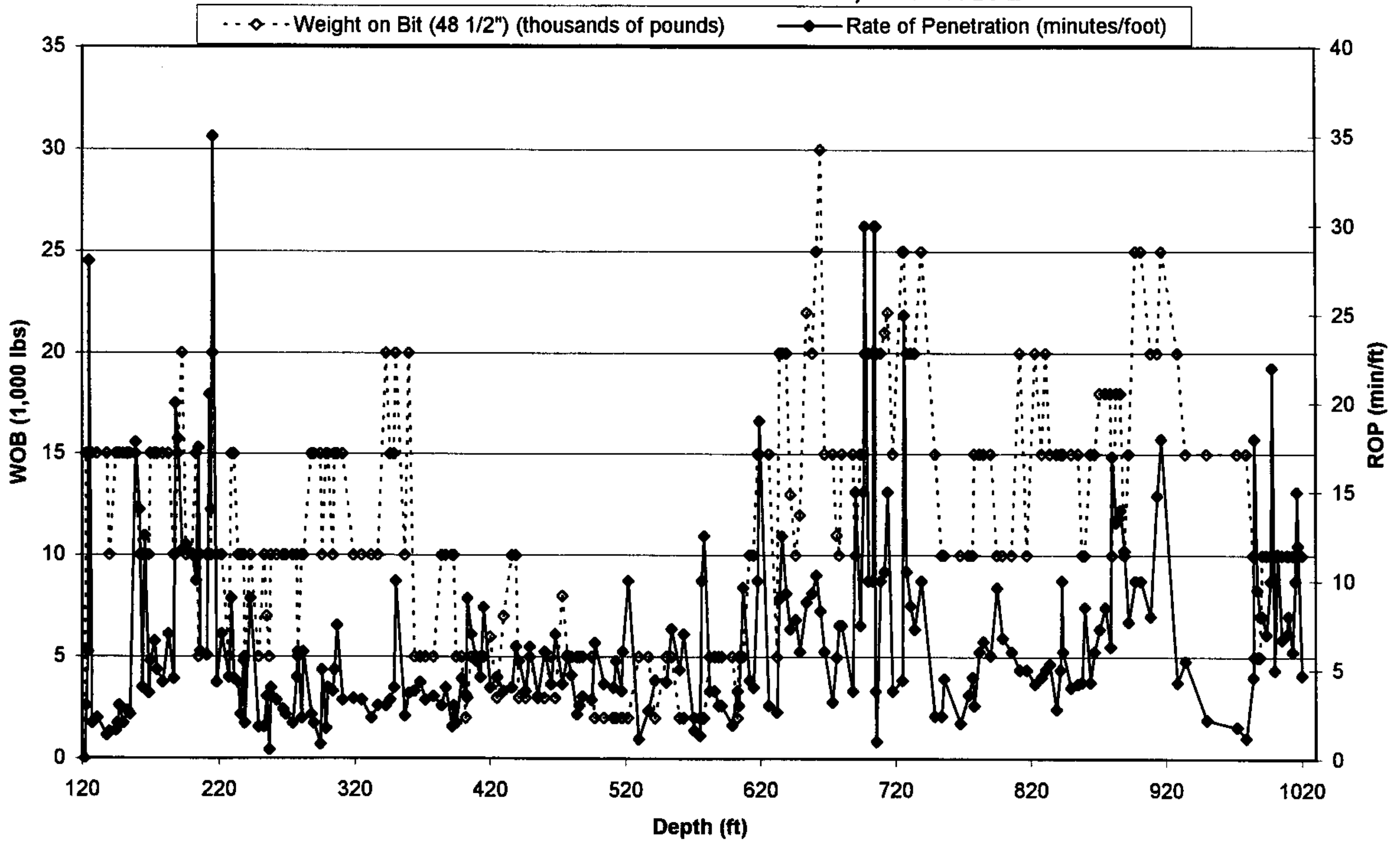


IW-1 WOB-ROP 0 to 120 (58)

City of Pompano Beach Concentrate Disposal Well IW-1

Weight on Bit / Rate of Penetration

48 1/2-inch Diameter Borehole 120 to 1,030 Feet BPL

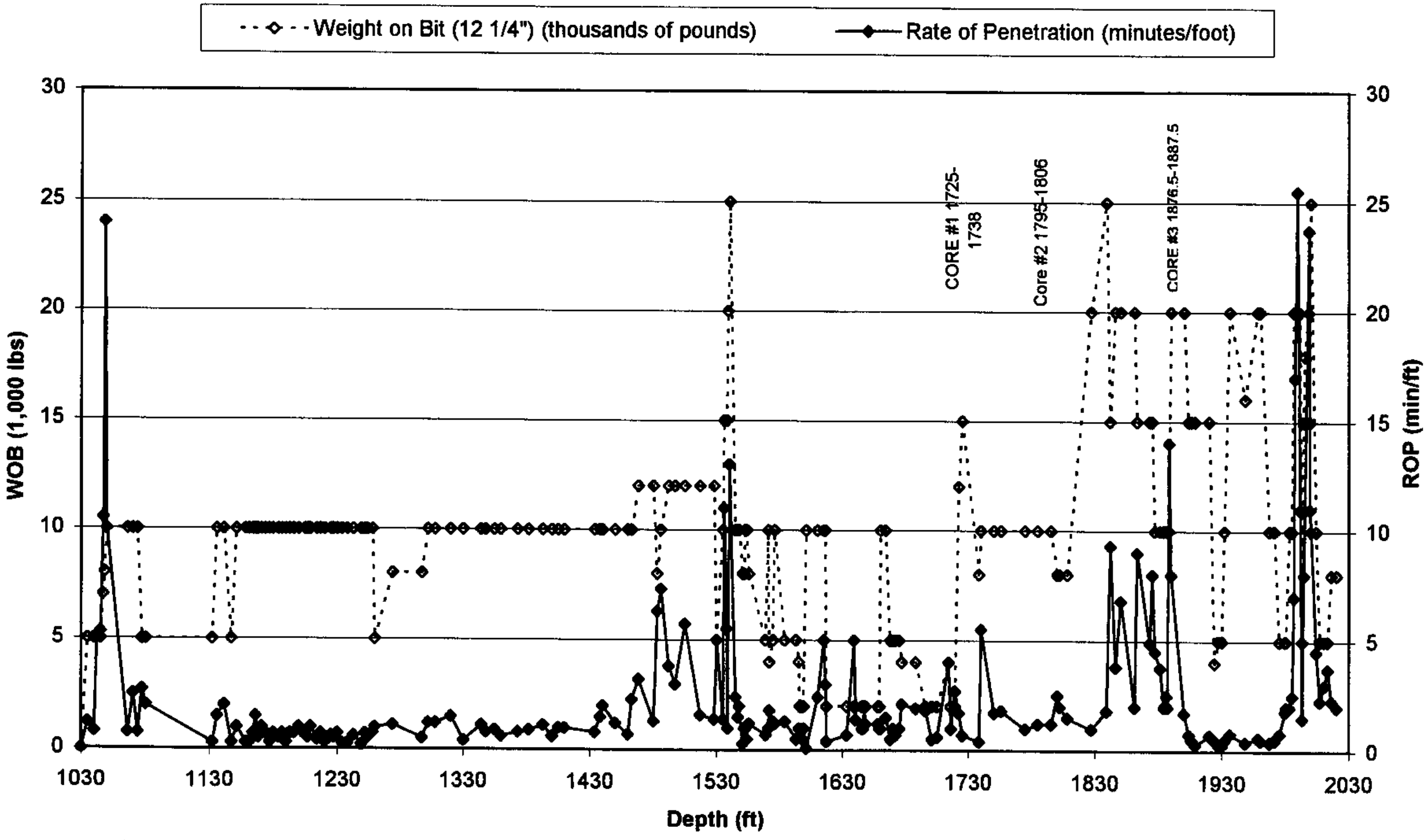


IW-1 WOB-ROP 120 to 1030 (48 .5)

City of Pompano Beach Concentrate Disposal Well IW-1

Weight on Bit / Rate of Penetration

12 1/4-inch Diameter Pilot hole 1,030 to 2,000 Feet BPL

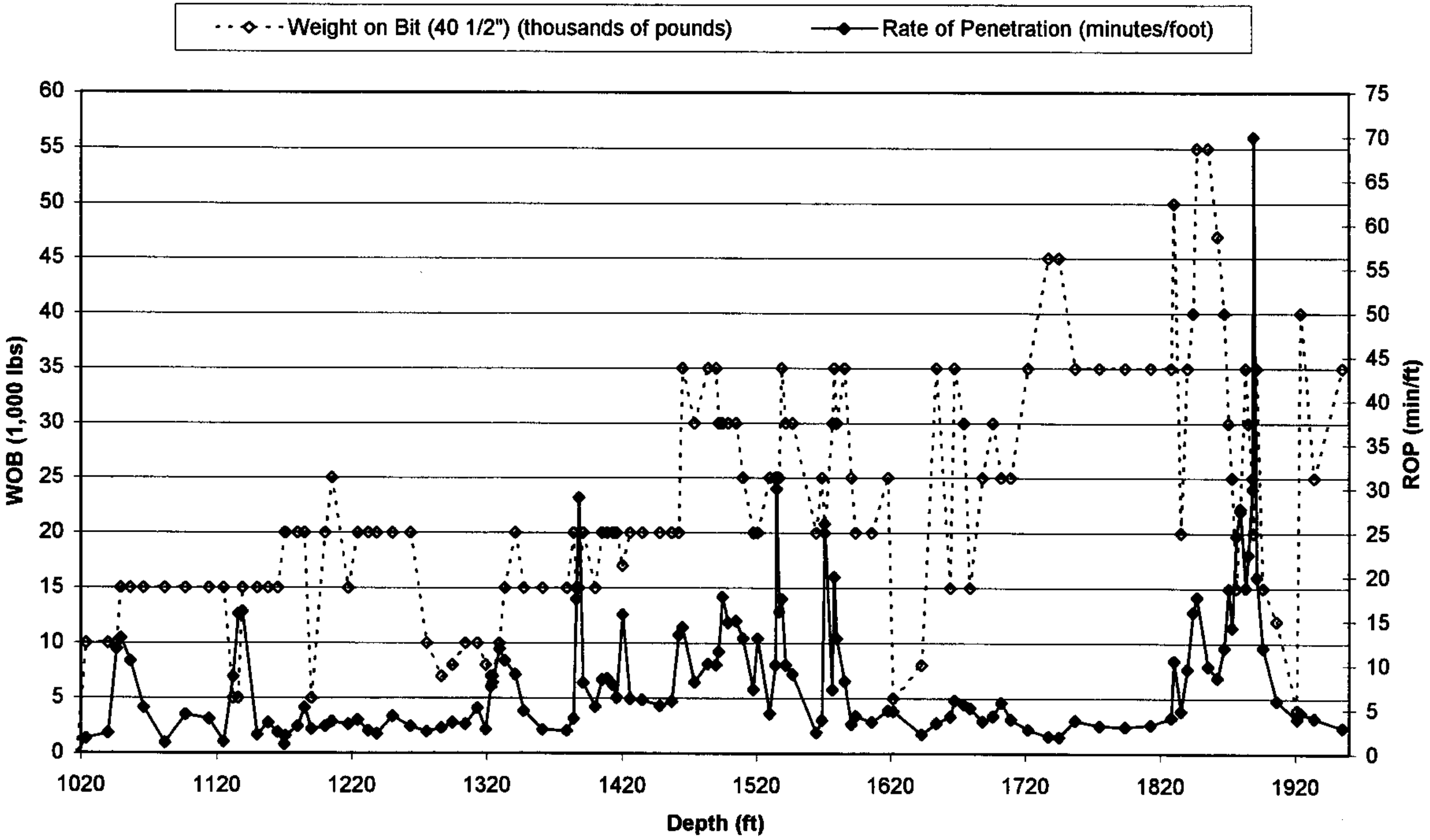


IW-1 WOB-ROP 1030 to 2000 (12.25)

City of Pompano Beach Concentrate Disposal Well IW-1

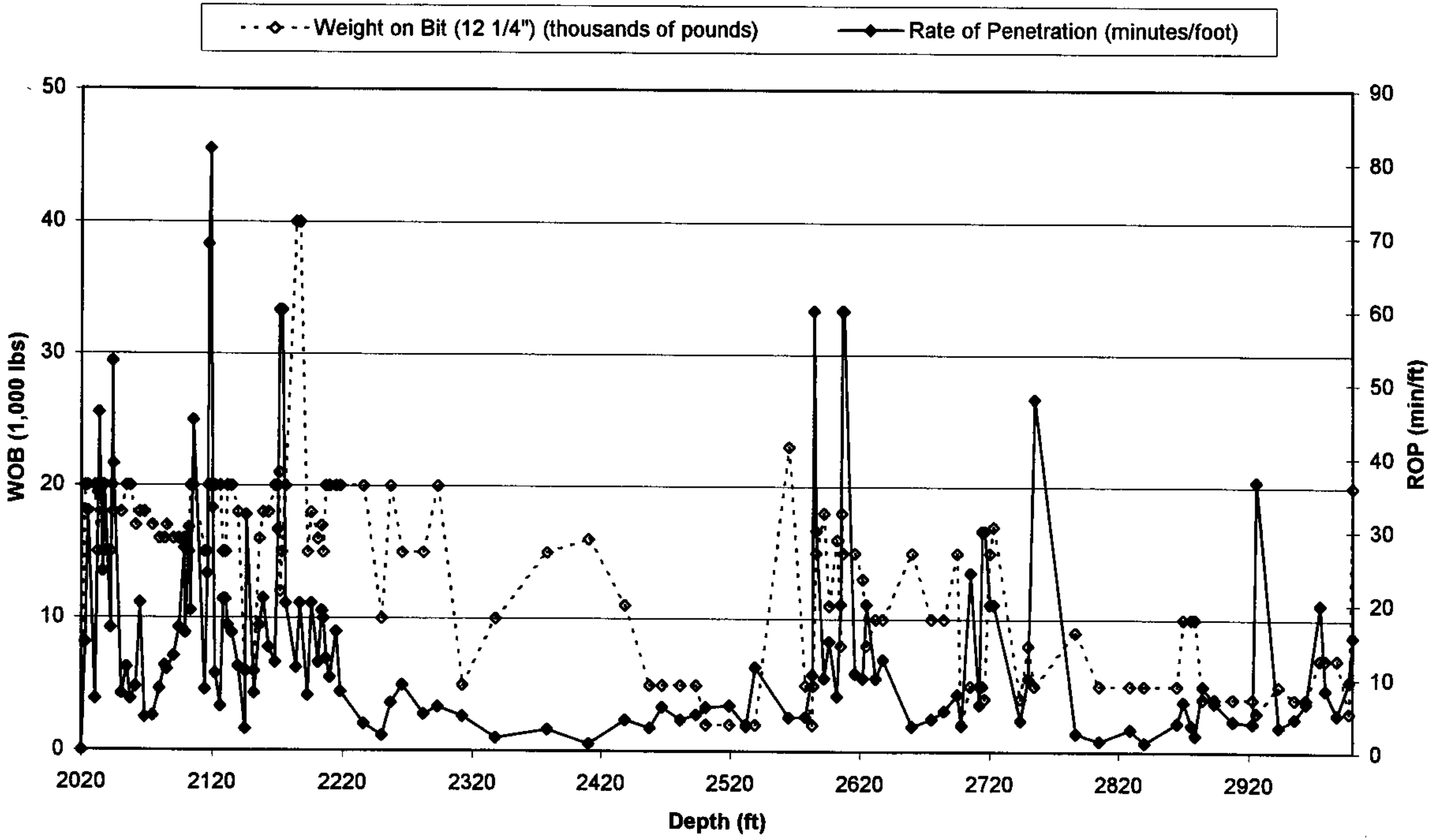
Weight on Bit / Rate of Penetration

40 1/2-inch Diameter Borehole 1,030 to 1,955 Feet BPL



IW-1 WOB-ROP 1030 to 1950 (40.5)

City of Pompano Beach Concentrate Disposal Well IW-1
Weight on Bit / Rate of Penetration
12 1/4-inch Diameter Pilot hole 2,020 to 3,000 Feet BPL

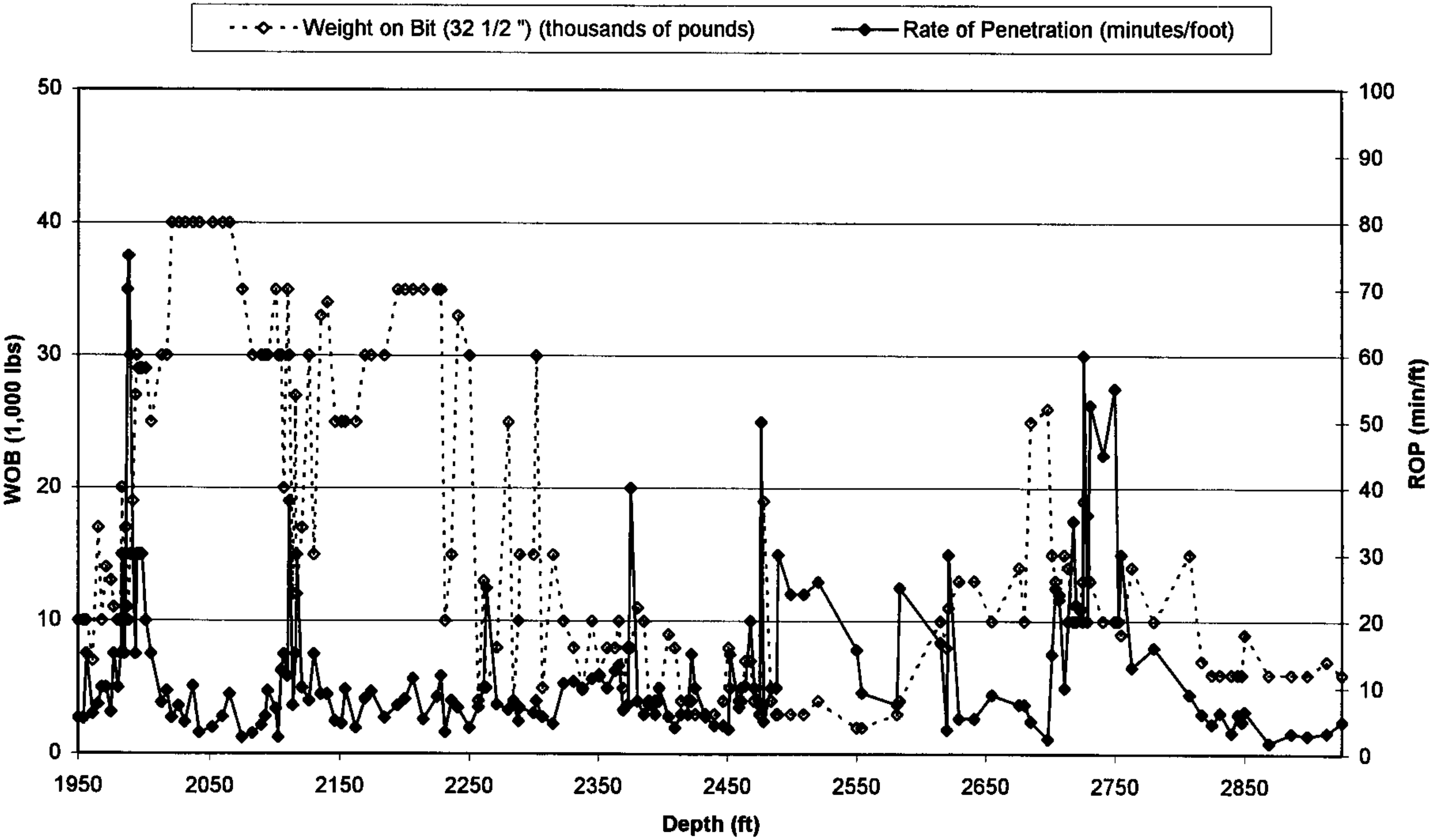


IW-1 WOB-ROP 2020 to 3000 (12.25)

City of Pompano Beach Concentrate Disposal Well IW-1

Weight on Bit / Rate of Penetration

Nominal 34-inch Diameter hole 1,950 to 2,925 Feet BPL



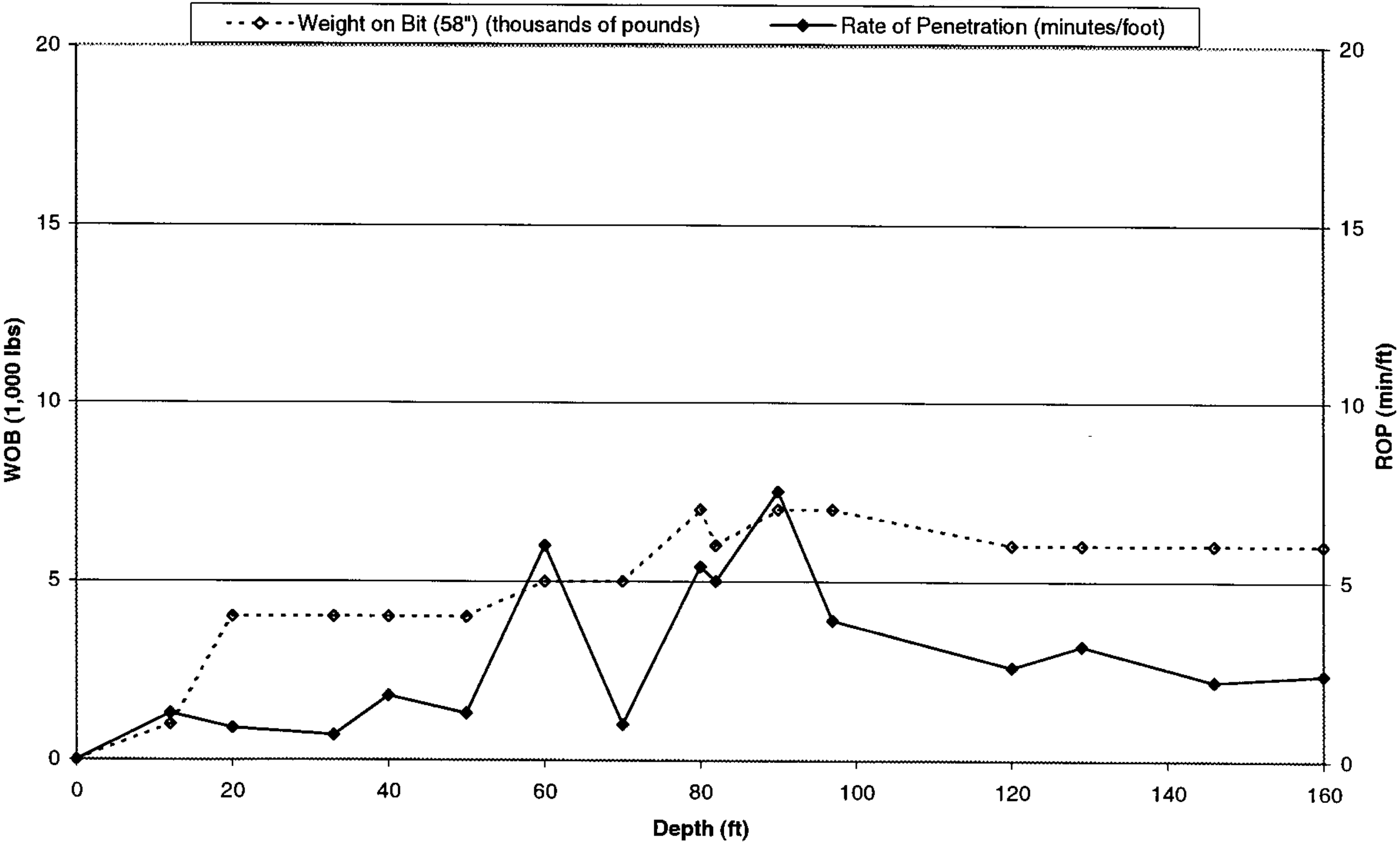
IW-1 WOB-ROP 1950 to 2925 (32.5)

Dual-Zone Monitor Well

City of Pompano Beach Dual-Zone Monitoring Well MW-1

Weight on Bit / Rate of Penetration

Nominal 34-inch Diameter Borehole 0 to 160 Feet BPL

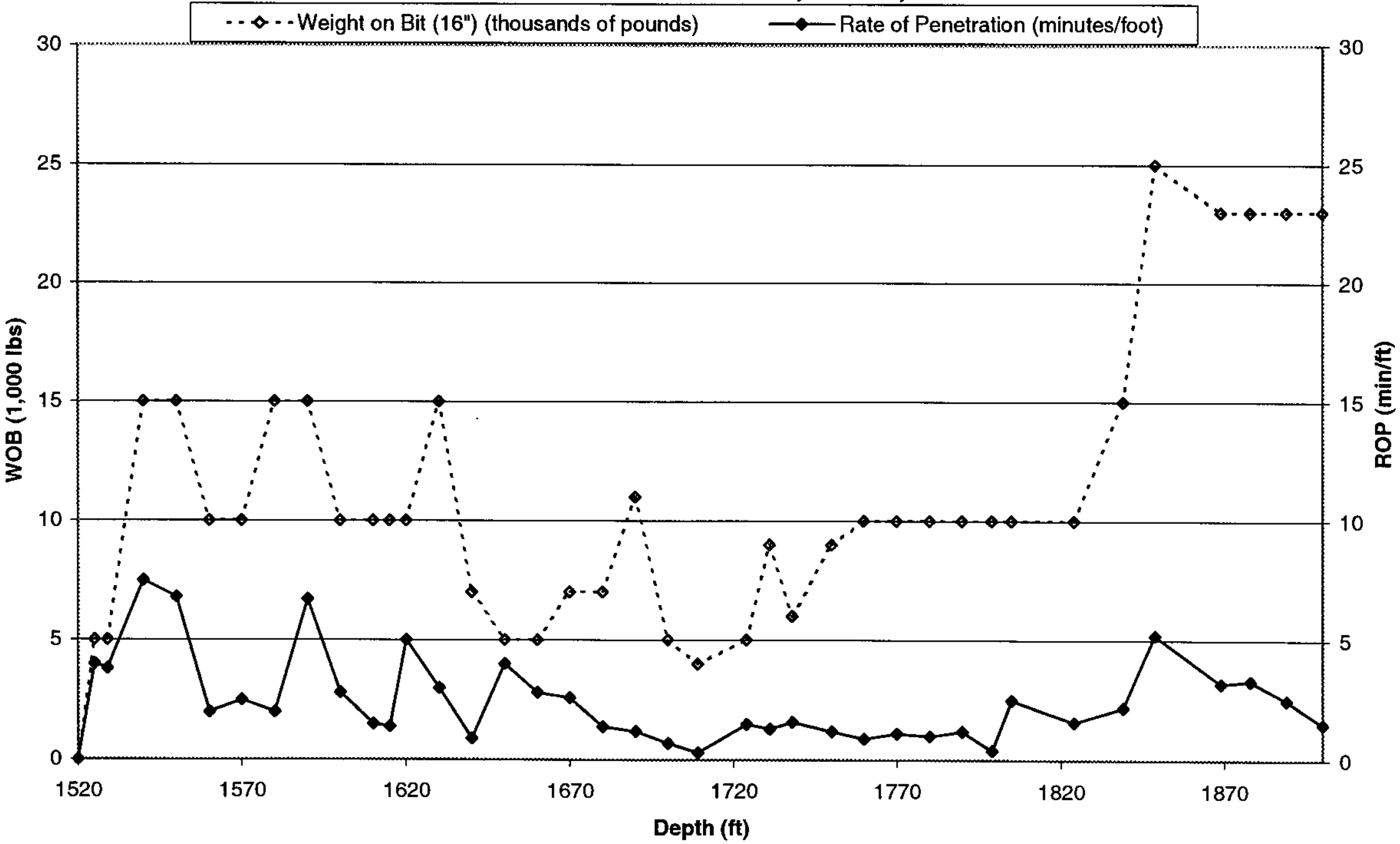


MW-1 WOB-ROP 0 to 160 (34)

City of Pompano Beach Dual-Zone Monitoring Well MW-1

Weight on Bit / Rate of Penetration

Nominal 16-inch Diameter Borehole 1,520 to 1,900 Feet BPL

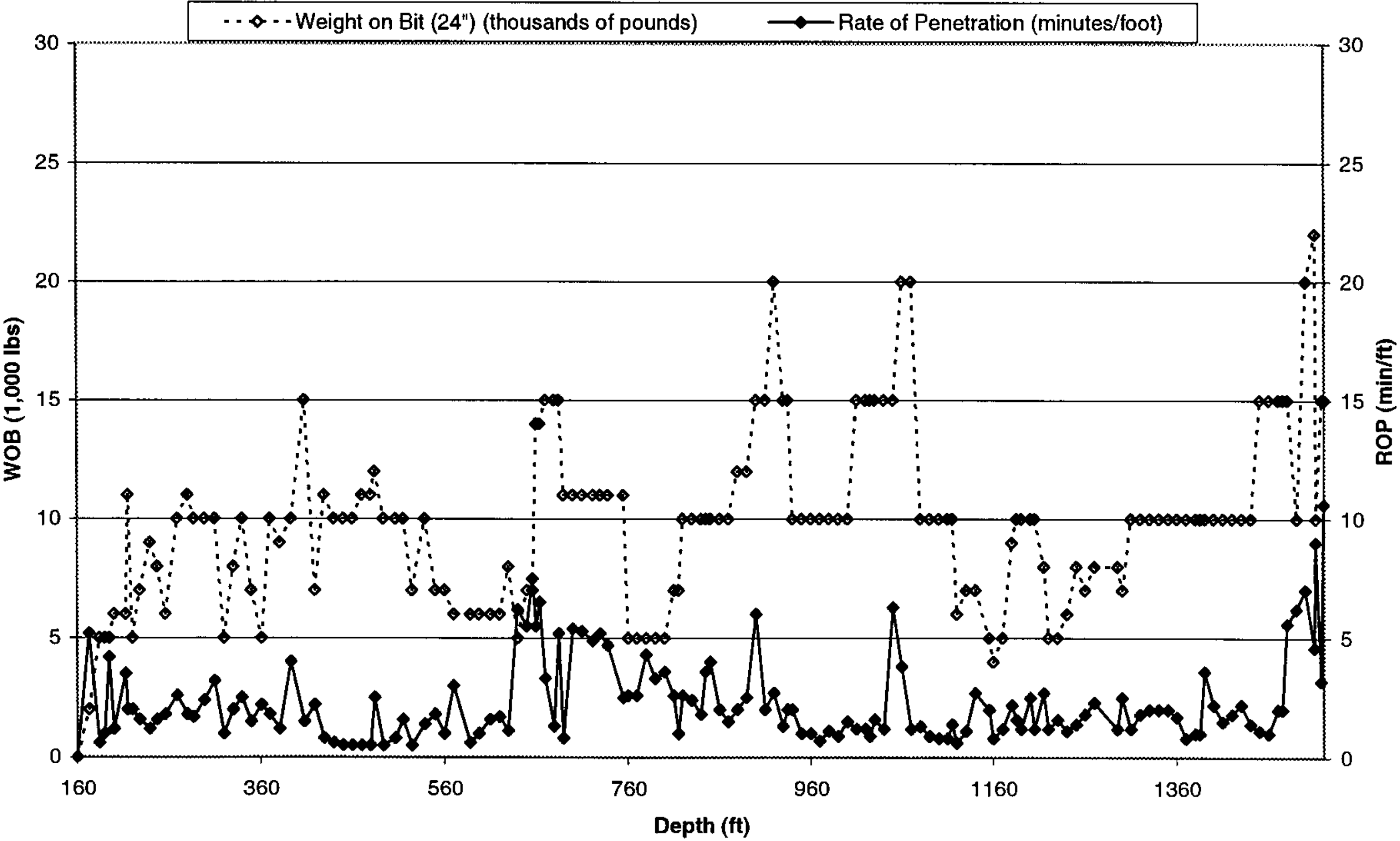


MW-1 WOB-ROP 1520 to 1900 (16)

City of Pompano Beach Dual-Zone Monitoring Well MW-1

Weight on Bit / Rate of Penetration

Nominal 24-inch Diameter Borehole 160 to 1,520 Feet BPL

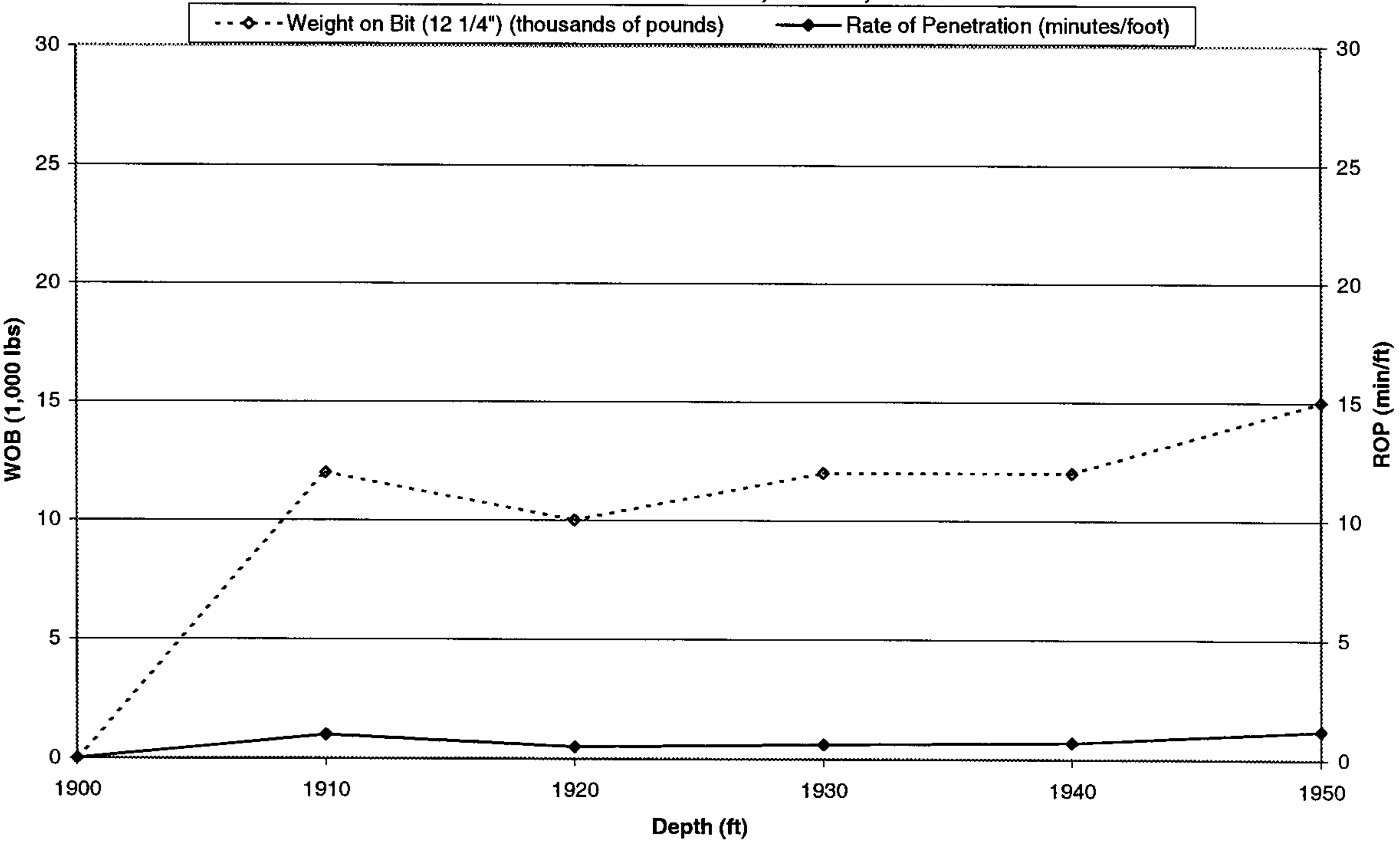


MW-1 WOB-ROP 160 to 1520 (24)

City of Pompano Beach Dual-Zone Monitoring Well MW-1

Weight on Bit / Rate of Penetration

12 1/4-inch Diameter Borehole 1,900 to 1,950 Feet BPL



MW-1 WOB-ROP 1900 to 1950 (12.25)

APPENDIX C

INCLINATION SURVEYS

Appendix C
Inclination Survey
Concentrate Disposal Well IW-1
City of Pompano Beach

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
90	0.000	58.5
180	0.250	48.5
270	0.125	48.5
360	0.250	48.5
450	0.250	48.5
540	0.250	48.5
630	0.250	48.5
720	0.500	48.5
810	0.250	48.5
900	0.300	48.5
990	0.300	48.5
1,080	0.250	12.25
1,170	0.250	12.25
1,260	0.400	12.25
1,350	0.500	12.25
1,440	0.300	12.25
1,530	0.300	12.25
1,620	0.300	12.25
1,710	0.400	12.25
1,800	0.350	12.25
1,890	0.250	12.25
1,980	0.250	12.25

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
1080	0.250	40.5
1170	0.250	40.5
1260	0.250	40.5
1350	0.200	40.5
1440	0.250	40.5
1530	0.250	40.5
1620	0.375	40.5
1710	0.250	40.5
1800	0.270	40.5
1890	0.270	40.5
1980	0.350	12.25
2070	0.300	12.25
2160	0.240	12.25
2250	0.250	12.25
2340	0.260	12.25
2430	0.370	12.25
2520	0.300	12.25
2610	0.350	12.25
2700	0.350	12.25
2790	0.400	12.25
2880	0.400	12.25
2970	0.250	12.25

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
2040	0.425	32.5
2130	0.250	32.5
2200	0.250	32.5
2310	0.250	32.5
2400	0.250	32.5
2490	0.250	32.5
2580	0.250	32.5

APPENDIX C

Inclination Survey
Dual–Zone Monitoring Well MW-1
City of Pompano Beach

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
90	0.260	32.5
180	0.250	22.5
270	0.370	22.5
360	0.250	22.5
450	0.350	22.5
540	0.300	22.5
630	0.400	22.5
720	0.300	22.5
810	0.150	22.5
900	0.250	22.5
990	0.250	22.5
1080	0.220	22.5
1170	0.240	22.5
1260	0.240	22.5
1350	0.350	22.5
1440	0.350	22.5
1530	0.400	14.75
1620	0.350	14.75
1710	0.300	14.75
1800	0.350	14.75
1890	0.125	14.75

APPENDIX D

GEOLOGIC LOGS

Injection Well Geologic Log

Appendix D
Geologic Log - (Drill Cuttings)
Concentrate Disposal Well IW-1
City of Pompano Beach

Depth (ft)	Thickness (ft)	Sample Description
0-10	10	SAND SANDSTONE AND SANDY LIMESTONE – Sand 50%, colorless, very coarse to very fine grained, unconsolidated, poorly sorted, subrounded quartz. Sandstone 30%, moderate brown (5YR 4/4) fine to medium grained, friable, highly argillaceous. Sandy Limestone 20%, grayish yellow (5Y 8/4) to yellowish gray (5Y 7/2) medium grained to cryptocrystalline, moderately hard, partly pelloidal, packstone with abundant medium grained angular colorless quartz.
10-20	10	LIMESTONE – 100% Yellowish gray (5Y 8/1) medium to fine grained, moderately hard, occasionally sparry, fossiliferous packstone with colorless fine grained subangular quartz.
20–40	20	LIMESTONE AND SANDSTONE – Limestone 60%, Grayish orange (10YR 7/4), coarse to fine grained, moderately to poorly cemented, fossiliferous wackestone to packstone with shell fragments. Sand 40%, coarse to fine grained, subangular to subrounded, poorly sorted unconsolidated quartz.
40–70	30	SAND AND LIMESTONE – Sand 95%, very coarse grained, subangular to subrounded, unconsolidated quartz. Limestone 5%, grayish orange (10YR 7/4) fossiliferous packstone with shell fragments.
70–80	10	SANDY LIMSTONE AND SAND– Sandy Limestone 90%, very pale orange (10YR 8/2) to moderate yellowish brown (10YR 5/2) fine to coarse grained, moderately hard to hard, fossiliferous, mudstone to packstone with shell fragments. Sand 10%, coarse to medium grained, subangular to subrounded, some moderately cemented with calcite, mostly unconsolidated quartz.
80–90	10	SANDY LIMESTONE AND SAND – Sandy Limestone 95%, Grayish orange (10YR 7/4) fine to coarse grained, fossiliferous, soft to moderately hard packstone to grainstone with shell fragments. Sand 5%, coarse to medium grained, angular to subrounded, poorly cemented to unconsolidated quartz.
90–100	10	SANDY LIMESTONE AND SAND – Sandy Limestone 80%, greenish gray (5GY 6/1) to very light gray (N8) fine to coarse grained wackestone to grainstone with coarse to medium grained sand and trace phosphorite. Sand 10%, colorless, coarse grained, subangular to subrounded, unconsolidated quartz. Trace to little shell, shell fragments and organics.
100–130	30	SANDY LIMESTONE AND SAND – Sandy Limestone 90%, Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) coarse to fine grained, mostly fossiliferous mudstone to packstone, with shell, shell fragments, and coarse to fine grained, subrounded sand. Sand 10%, medium to coarse grained, angular to rounded moderately to poorly cemented quartz. Trace light gray (N7) medium grained packstone.

Depth (ft)	Thickness (ft)	Sample Description
120–140	20	LIMY SANDSTONE AND SANDY LIMESTONE – Limy Sandstone 80%, Greenish gray (5GY 6/1) medium to fine grained, subrounded to rounded quartz, moderately to poorly sorted with coarse to fine grained, fossiliferous, moderately hard, with shell and little phosphorite, to medium grained, subrounded, moderately cemented. Sandy Limestone 20%, yellowish gray (5Y 7/2) fine to coarse grained, subrounded, moderately hard to hard wackestone with medium grained, subrounded, moderately sorted quartz sand. Trace phosphorite.
140–150	10	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) fine to medium grained, subrounded to rounded, well sorted with coarse grained wackestone, shell fragments and trace phosphorite.
150–160	10	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone 80%, as above. Limy Sandstone 20%, yellowish gray (5Y 7/2) fine to coarse grained, subangular, colorless quartz in crystalline calcite matrix with shell fragments and trace phosphorite
160–200	40	LIMY SANDSTONE AND PHOSPHORITE – Limy Sandstone 95%, yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) coarse to very fine grained, subrounded to rounded, moderately well sorted quartz with fine grained calcite and shell fragments. Phosphorite 5%, black (N9) medium grained, well sorted, moderately to well cemented.
200–220	20	SANDY LIMESTONE – 100% Light olive gray (5Y 6/1) to greenish gray (5GY 6/1) fine grained, wackestone, with mollusks and echinoids fragments with colorless, coarse to very fine grained, moderately sorted, angular to rounded quartz sand and trace phosphorite.
220-260	40	LIMY SANDSTONE – 100% Pale olive (10Y 6/2) to light olive gray (5Y 6/1) coarse to very fine grained, moderately hard to hard, angular to rounded, moderately to well sorted, slightly phosphatic quartz with 20% shell fragments and greenish gray (5GY 6/1) coarse to very fine grained, moderately sorted, angular to rounded limestone with trace phosphorite.
260–300	40	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) coarse to very fine grained, moderately cemented, angular to rounded, moderately to well sorted quartz with little shell fragments and trace interbedded coarse to very fined grained limestone. Trace Phosphorite.
300–310	10	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) medium to fine grained, angular to rounded, moderately to poorly cemented quartz with 30% Limestone, 15% shell fragments and trace phosphorite.
310–330	20	SANDY LIMESTONE – 100% Yellowish gray (5Y 8/1) to medium light gray (N6) medium to fine grained, moderately hard, fossiliferous packstone with colorless coarse to fine grained angular to rounded moderately sorted quartz sand and trace phosphorite.

Depth (ft)	Thickness (ft)	Sample Description
330–360	30	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 90%, yellowish gray (5Y 8/1) to light olive gray (5Y 5/2) medium to fine grained, moderately hard, fossiliferous wackestone with shell fragments and fine to medium grained angular to subangular quartz sand and trace phosphorite. Limestone 10%, white (N1) medium to fine grained moderately hard sandy packstone with little quartz sand.
360–380	20	LIMY SANDSTONE – 100% Light olive gray (5Y 5/2) to light olive gray (5Y 6/1) fine to coarse grained, moderately well cemented, angular to subangular quartz with carbonate mudstone, shell fragments and trace phosphorite.
380–390	10	CLAYEY LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) medium to very fine grained, subangular quartz, moderately well cemented, with abundant calcareous clay, shell fragments and little phosphorite.
390–400	10	CLAYEY LIMY SANDSTONE, SANDSTONE AND LIMESTONE – Clayey Limy Sandstone 80%, as above. Sandstone 10%, light gray (N7) very fine grained, very well cemented with shell fragments and phosphorite. Limestone 10%, yellowish gray (5Y 8/1) coarse grained hard sandy packstone.
400–500	100	CLAYEY SANDY LIMESTONE – 100% light olive gray (5Y 5/2) fine grained, moderately hard, fossiliferous wackestone with clay, fine to very fine grained sand and little phosphorite. Clay content increasing below 480 feet. Trace coarse grained packstone with coarse sand at 430 feet. Trace coarse grained packstone at 480 feet.
500–510	10	SANDY CLAY AND CLAYEY SANDY LIMESTONE – Sandy Clay 70%, light olive gray (5Y 5/2) soft, moderately plastic calcareous with very fine grained quartz sand and little phosphorite. Clayey Sandy Limestone 30%, as above.
510–550	40	SANDY CLAY – 100%, light olive gray (5Y 5/2) non–plastic, moderately firm, with abundant very fine grained sand.
550–580	30	SANDY CLAY AND LIMY SANDSTONE – Sandy Clay 70%, light olive gray (5Y 5/2) very soft, moderately plastic, with abundant fine grained quartz and little phosphorite. Limy Sandstone 30%, medium light gray (N6) fine grained, well cemented, with medium grained fossiliferous limestone and trace phosphorite.
580–630	50	SANDY CLAY – 100% Grayish olive (10Y 4/2) very soft, non–plastic, phosphatic, slightly calcareous with fine grained quartz.
630–650	20	SANDY CLAY – 100%, Yellowish gray (5Y 7/2) soft, low plasticity, slightly calcareous, with very fine grained quartz and little phosphorite.
650–660	10	SANDY CLAY – 100% Greenish gray (5GY 6/1) very soft, non plastic with very fine grained quartz and trace phosphorite.
660–670	10	CLAYEY SAND – 100% Yellowish gray (5Y 7/4) very fine grained, unconsolidated quartz with clay.

Depth (ft)	Thickness (ft)	Sample Description
670–730	60	SANDY CLAY – 100% Pale olive (10Y 6/2) soft, low plasticity, calcareous, with very fine grained quartz sand. Occasional clayey sand lenses at 680 feet, trace limestone at 690 feet.
730–750	20	SANDY CLAY AND LIMESTONE – Sandy Clay 70%, as above. Limestone 30%, yellowish gray (5Y 7/2) fine grained, moderately soft wackestone.
750–760	10	CLAY – 100% Yellowish gray (5Y 7/2) soft, low plasticity, silty, slightly phosphatic with trace chert.
760–800	40	SANDY CLAY – 100% Yellowish gray (5Y 7/2) stiff to hard, moderately plastic, slightly phosphatic with very fine grained quartz sand.
800–850	50	SANDY CLAY – 100% Pale olive (10Y 6/2) stiff to hard, moderately plastic with very fine grained quartz sand.
850–870	20	SANDY CLAY AND PHOSPHORITE – Sandy clay 80%, as above. Phosphorite 20%, black (N9) fine grained, hard, occurring as granules.
870–900	30	SANDY CLAY – 100% Pale olive (10Y 6/2) very stiff to hard, plastic, calcareous, with little fine grained limestone, and abundant very fine grained sand.
900–910	10	CLAY AND CHERT – Clay 90%, light olive gray (5Y 5/2) hard, plastic. Chert 10%, olive gray (5Y 3/2) very fine grained, very hard.
910–940	30	SANDY CLAY – 100% Pale olive (10Y 6/2) firm to hard, calcareous, with fine grained quartz sand and little phosphorite. Trace pale olive (10Y 6/2) clayey phosphatic Limestone at 930.
940–950	10	SANDY CLAYEY LIMESTONE – 100% Yellowish gray (5 Y 7/2) fine to medium grained, very soft to moderately soft, phosphatic wackestone with fine to medium grained quartz sand. Trace to few shell fragments and fossils.
950–970	20	SANDY CLAY AND SANDY CLAYEY LIMESTONE – Sandy Clay 80%, pale olive (10Y 6/2) soft, plastic with very fine grained quartz sand. Sandy Clayey Limestone 20% as above.
970–1000	30	CLAYEY LIMESTONE AND SANDY CLAY – Clayey Limestone 70%, light olive gray (5Y 5/2) medium grained, hard fossiliferous, phosphatic wackestone. Sandy Clay 30%, as above.
1000–1030	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) to medium grained moderately hard packstone. 20% Pale yellowish gray (5Y 9/1) cryptocrystalline, moderately hard carbonate mudstone.
1030–1040	10	LIMESTONE – 100% Yellowish gray (5Y 8/1) fine grained to cryptocrystalline, moderately hard wackestone to carbonate mudstone.

Depth (ft)	Thickness (ft)	Sample Description
1040–1050	10	LIMESTONE – 100%; 70% Greenish gray (5GY 6/1) fine to very coarse grained, moderately hard, slightly sparry, fossiliferous wackestone with trace casts. 30% Pale olive (10Y 6/2) fine to medium grained, moderately soft, fossiliferous, slightly phosphatic, slightly sandy packstone.
1050–1070	20	SANDSTONE AND LIMESTONE – Sandstone 60%, light olive gray (5Y 5/1) fine to medium grained, poorly sorted, poorly cemented, slightly phosphatic. Limestone 40%, yellowish gray (5Y 8/1) cryptocrystalline to coarse grained, fossiliferous, occasionally slightly sandy wackestone with trace molds. Trace forams.
1070–1160	90	LIMESTONE – 100% Very pale orange (10YR 8/2) medium grained, moderately soft to soft packstone with tests and forams. Trace dark gray (N3) very fine grained Limestone at 1140. Trace medium grained fossiliferous packstone at 1150.
1160–1200	40	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) medium grained, moderately soft to moderately hard packstone with few forams.
1200–1270	70	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) as above. 30% Yellowish gray (5Y 8/1) fine grained moderately soft to soft, slightly vuggy wackestone. Trace light olive gray hard carbonate mudstone at 1160.
1270–1380	110	LIMESTONE – 100% Pale yellowish brown (10YR 6/2) to yellowish gray (5Y 8/1) medium to fine grained, moderately soft packstone to rarely grainstone with 10% to 20% forams. Trace yellowish gray (5Y 8/1) highly vuggy carbonate mudstone at 1320. Trace medium light gray (N6) fine grained hard wackestone at 1360. Trace test at 1370.
1380–1410	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained moderately soft pelloidal packstone. 20% Light gray (N7) hard carbonate mudstone. Trace forams. Trace interbedded Dolomitic Limestone at 1400.
1410–1430	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1) medium to fine grained, moderately soft, pelloidal packstone. 20% Very light gray (N8) cryptocrystalline, moderately hard carbonate mudstone. 10% Dark gray (N7) medium grained, hard, fossiliferous wackestone. Abundant forams.
1430 –1460	30	LIMESTONE – 100%; 80%–60% Yellowish gray (5Y 8/1) coarse to fine grained, moderately soft to moderately hard, pelloidal packstone to grainstone. 10%–20% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone. 10%–20% Very light gray (N8) as above.
1460–1480	20	LIMESTONE AND DOLOMITE – Limestone 90%; 70% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft to moderately hard, pelloidal packstone/grainstone with trace Dolomitic laminations. 20% Medium dark gray (N4) to medium light gray (N6) fine grained, moderately hard, vuggy wackestone. Dolomite 10%, dark yellowish brown (10YR 4/2) microcrystalline, hard sucrossic.

Depth (ft)	Thickness (ft)	Sample Description
1480–1500	20	LIMESTONE AND DOLOMITE – Limestone 90%; 70% Very pale orange (10YR 9/2) cryptocrystalline, moderately hard, very slightly vuggy carbonate mudstone. 30% Very pale orange (10YR 8/2) to light olive gray (5Y 6/1) medium to coarse grained, pelloidal packstone to grainstone. 20% Medium gray (N5) fine grained, hard wackestone. Dolomite 10%–20% as above.
1500–1510	10	LIMESTONE AND SANDSTONE – Limestone 70% as above. Sandstone 30%, moderate yellowish brown (10YR 5/4) fine to very fine grained, moderately cemented. Trace Dolomite as above.
1510–1520	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2) fine to medium grained, moderately soft, fossiliferous packstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, carbonate mudstone. Trace to little forams. Trace Sandstone as above.
1520–1530	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained, moderately soft to moderately hard, fossiliferous, partly sparry packstone to rarely grainstone. 20% White (N9) to very light gray (N8) cryptocrystalline, moderately hard, slightly vuggy, carbonate, mudstone. Few forams and tests. Trace light olive gray (5Y 6/1) microcrystalline hard Dolomite.
1530–1550	20	LIMESTONE AND DOLOMITE – Limestone 70% as above. Dolomite 30% moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) fine grained to microcrystalline, moderately hard to hard. Trace fine grained, slightly phosphatic Sandstone. Trace to few forams.
1550–1560	10	LIMESTONE – 100% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, very soft to soft packstone with few forams.
1560–1580	20	LIMESTONE – 100%; 90% As above. 10% Medium dark gray (N4) very fine grained wackestone/packstone.
1580–1590	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) medium to fine grained, moderately soft packstone to grainstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard carbonate mudstone. 20% Pale yellowish brown (10YR 6/2) to grayish brown (5YR 3/2) fine to medium grained, hard, occasionally fossiliferous wackestone. Few flat forams up to 10 mm in diameter.
1590–1600	10	LIMESTONE – 100%; 90% Grayish orange (10YR 7/4) fine to medium grained, moderately soft, pelloidal, slightly fossiliferous packstone. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard carbonate mudstone. Few forams and tests. Trace Dolomitic Limestone.
1600–1610	10	LIMESTONE – 100%; 80% Grayish orange (10YR 7/4) to very pale orange (10YR 8/2) fine grained, moderately soft to moderately hard, rarely slightly Dolomitic packstone. 20% Medium dark gray (N4) fine grained, hard wackestone to carbonate mudstone. Trace forams.

Depth (ft)	Thickness (ft)	Sample Description
1610–1630	20	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) fine to medium grained, moderately soft packstone. 30% Light olive gray (5Y 8/1) to light olive gray (5Y 6/1) medium grained, hard, fossiliferous wackestone to carbonate mudstone.
1630–1640	10	LIMESTONE – 100% Grayish orange (10YR 7/4) fine grained, soft to moderately soft packstone with abundant forams.
1640–1650	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, moderately hard packstone. 10% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy carbonate mudstone.
1650–1660	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) as above. 30% Medium gray (N5) dominantly fine to medium grained, micritic, locally vuggy wackestone. 10% Pale yellowish brown (10YR 6/2) as above.
1660–1670	10	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) fine grained, moderately soft wackestone. 30% Medium dark gray (N4) to olive gray (5Y 4/1) fine grained, hard, slightly vuggy, micritic wackestone. 10% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone.
1670–1680	10	LIMESTONE– 100% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) fine grained, moderately soft, slightly vuggy packstone. Trace to little medium dark gray (N4) wackestone as above.
1680–1700	20	LIMESTONE– 100%; 50% Olive gray (5Y 4/1) to dark gray (N3) fine to medium grained, soft to moderately hard, fossiliferous packstone to wackestone. 40% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft, pelloidal packstone. 10% Yellowish gray (5Y 8/1) to light gray (N7) cryptocrystalline, hard carbonate mudstone. Trace to few forams and test.
1700–1710	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) fine to very fine grained, moderately soft, locally slightly Dolomitic, packstone to wackestone. 10% Pale olive gray (5Y 6/1) cryptocrystalline, hard, slightly vuggy carbonate mudstone. Few forams and test.
1710–1725	15	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) medium grained, moderately hard, fossiliferous, partly slightly Dolomitic grainstone to packstone. 20% Yellowish gray (5Y 8/1) hard, microcrystalline to cryptocrystalline, carbonate mudstone. 10% Medium gray (N5) fine grained, moderately hard to hard, fossiliferous wackestone. Few forams and test.
1725–1738	13	CORE # 1

Depth (ft)	Thickness (ft)	Sample Description
1738–1785	57	LIMESTONE – 100%; 70% yellowish gray (5Y 8/1) to occasionally olive gray (5Y 4/1) fine to very fine grained, moderately soft to hard, well cemented, fossiliferous, partly sparry packstone. 30% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) very fine grained wackestone to carbonate mudstone. Trace to few forams and test. Trace Dolomitic Limestone and neomorphic calcite.
1795–1806	11	CORE #2
1806–1810	4	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) to light gray (N7) fine grained, hard wackestone. 40% Yellowish gray (5Y 8/1) fine to medium grained, moderately soft packstone. Trace soft Dolomitic packstone. Trace to few forams and tests.
1810–1840	30	LIMESTONE AND DOLOMITE – Limestone 90%–80%; 60% Pale yellowish brown (10YR6/2) to medium light gray (N6) fine grained, moderately hard wackestone to mudstone. 40% Pale yellowish brown (10YR 6/2) to medium light gray (N6) medium to fine grained, moderately soft packstone, percentage decreasing with depth. Dolomite 10%–20% Dark yellowish brown (10YR 4/2) very fine grained, fossiliferous, occasionally limy, percentage increasing with depth. Trace Dolomitic Limestone. Few tests and forams.
1840–1850	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to rarely grayish black (N2) fine grained to microcrystalline, moderately hard to very hard, sucrosic. Trace very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone
1850–1876.5	26.5	DOLOMITE AND LIMESTONE – Dolomite 70%, as above. Limestone 30%, very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone.
1876.5–1887.5	11	CORE #3
1887.5–1900	12.5	DOLOMITE AND DOLOMITIC LIMESTONE – Dolomite 70%; 60% dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), very fine grained, very hard, weakly vuggy, sucrosic. 40% Pale yellowish brown (10YR 6/2) cryptocrystalline, very hard. Dolomitic Limestone 30%, pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy, carbonate mudstone with very fine grained Dolomite inclusions.
1900–1920	20	LIMESTONE, DOLOMITE AND DOLOMITIC LIMESTONE – Limestone 70%, very pale orange (10YR 8/2) fine to rarely medium grained, dominantly hard to rarely moderately hard, well indurated, occasionally dolomitic packstone to rarely wackestone. Dolomite 20%, dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2) fine grained to microcrystalline, very hard. Dolomitic Limestone 10%, pale yellowish brown (10YR 6/2) cryptocrystalline, very hard carbonate mudstone with microcrystalline Dolomite inclusions.
1920–1930	10	CORE #4

Depth (ft)	Thickness (ft)	Sample Description
1930–1940	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) medium grained, hard, well indurated, fossiliferous packstone with forams and tests. 30% Very pale orange (10YR 8/2) coarse to medium grained, moderately hard fossiliferous grainstone with forams. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard weakly vuggy carbonate mudstone with trace neomorphic calcite.
1940–1950	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) cryptocrystalline, hard, rarely very weakly vuggy carbonate mudstone. 20% Very pale orange (10YR 8/2) hard, very fine grained wackestone. 10% Olive gray (5Y 4/1) cryptocrystalline, hard micritic mudstone. 10% White (N9) very soft, fossiliferous carbonate marl.
1950–1960	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) fine to medium grained, moderately soft to occasionally moderately hard, well indurated, fossiliferous, partly Dolomitic packstone with forams. 20% Very pale orange (10YR 8/2) very fine grained, hard, vuggy wackestone. Abundant forams.
1960–1970	10	CORE #5
1970–1975	5	LIMESTONE – 100%; 60% Grayish orange (10YR 7/4) fine to medium grained, hard, fossiliferous packstone. 20% Medium dark gray (N4) microcrystalline to cryptocrystalline, very hard, weakly vuggy carbonate mudstone, vuggs occasionally lined with euhedral Dolomite rhombs. 20% Light olive gray (5Y 6/1) fine to medium grained, hard, fossiliferous wackestone with tests.
1975–1985	10	CORE #6
1985–2000	15	DOLOMITE – 100%; 90% Yellowish brown (10YR 5/2) coarse grained to cryptocrystalline, very hard with few crystal filled vuggs. 10% Black olive (5Y 2/1) medium grained, very hard.
2000–2010	10	CORE #7
2010–2020	10	DOLOMITE AND LIMESTONE – Dolomite 90%, dark yellowish brown (10YR 4/2) to grayish orange (10YR 7/4) microcrystalline, very hard, sucrosic. Limestone 10%, very pale orange (10YR 8/2) fine to occasionally medium grained, generally moderately soft, partly sparry packstone.
2020–2030	10	CORE #8
2030–2040	10	DOLOMITE AND DOLOMITE BRECCIA – 100%; 80% Moderate yellowish brown (10YR 5/4) microcrystalline, very hard, partly sucrosic. 10% Pale yellowish brown (10 YR 6/2) cryptocrystalline very hard. Dolomite Breccia 10%, moderate yellowish brown (10YR 5/4) to pale yellowish brown (10 YR 6/2), lighter colored angular fragments in darker colored matrix (matrix > clast supported) very hard.
2040–2070	30	DOLOMITE – 100%; 60%–80% Moderate yellowish brown (10YR 5/4) to pale yellowish brown (10 YR 6/2) cryptocrystalline to microcrocrystalline, very hard. 40%–20% Pale yellowish brown (10 YR 6/2) to grayish orange (10YR 7/4) microcrystalline to fine grained, moderately vuggy, moderately hard, partly sucrosic.

Depth (ft)	Thickness (ft)	Sample Description
2070–2140	70	DOLOMITE – 100%, Moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) fine grained to cryptocrystalline, very hard, dominantly sucrosic, rarely weakly vuggy at 2120. Trace very pale orange (10 YR 8/2) Dolomitic Limestone at 2130.
2140–2160	20	DOLOMITE AND LIMESTONE – Dolomite 60%–80%, light olive gray (5Y 5/2) to moderate yellowish brown (10YR 5/4) dominantly very fine grained to cryptocrystalline, rarely medium to coarse grained, hard to very hard. Limestone 40%–20% very pale orange (10YR 8/2) fine grained, moderately soft, pelloidal grainstone to packstone occasionally containing medium grained euhedral Dolomite crystals. Trace tests. Trace very light gray (N8) fine grained, poorly cemented euhedral Dolomite 2160.
2160–2220	60	DOLOMITE AND LIMESTONE – Dolomite 80%, grayish orange (10YR 7/4) to dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4) fine grained to cryptocrystalline, grain size generally decreasing with depth, hard, well cemented, very well indurated, angular anhedral to uhedral rhomohedral Dolomite crystals. Limestone 20% very pale orange (10YR 8/2) fine grained to cryptocrystalline, soft to moderately hard wackestone to carbonate marl. Trace Dolomitic Limestone at 2210.
2220–2230	10	DOLOMITE AND DOLOMITIC LIMESTONE – Dolomite 70%, dominantly moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2) medium grained to very fine grained, moderately to well cemented anhedral to uhedral rohmbohedral Dolomite crystals. Dolomitic Limestone 30%, very pale orange (10YR 8/2) medium grained moderately soft pelloidal packstone with anhedral and euhedral dolomite rhombs.
2230–2250	20	DOLOMITE AND LIMESTONE – Dolomite 60%, dark yellowish orange (10YR 6/6) as above. Limestone 40%, very pale orange (10YR 8/2) medium to fine grained, moderately soft partly Dolomitic grainstone to packstone.
2250–2270	20	DOLOMITE AND DOLOMITIC LIMESTONE – Dolomite 90%, dark yellowish brown (10YR 4/2) to rarely dusky yellowish brown (10YR 2/2) fine grained moderately well cemented, moderately hard anhedral to euhedral rhombahedral crystals. Dolomitic Limestone 10%, very pale orange (10YR 8/2) fine grained, moderately soft, moderately to highly Dolomitic grainstone to packstone.
2270–2280	10	DOLOMITIC LIMESTONE, DOLOMITE AND LIMESTONE – Dolomitic Limestone 40%, grayish orange (10YR 7/4) medium to fine grained, moderately soft to moderately hard, pelloidal, fossiliferous packstone with auhedral to euhedral rhombahedral crystal matrix. Dolomite 40%, moderate yellowish brown (10YR 5/4) medium to fine grained, anhedral to euhedral rohomhedral crystals, poorly to moderately cemented. Limestone 20%, very pale orange (10YR 8/2) very fine to medium grained, moderately soft to very soft packstone to carbonate marl.
2280–2290	10	DOLOMITE AND LIMESTONE – Dolomite 90% as above. Limestone 10% as above.

Depth (ft)	Thickness (ft)	Sample Description
2290–2300	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) medium to very fine grained, anhedral to euhedral rohombehedral crystals, poorly to moderately well cemented with few distinct to prominent mottles.
2300–2310	10	DOLOMITE AND LIMESTONE – Dolomite 50%, as above. Limestone 50%, very pale orange (10YR 8/2) medium to fine grained, moderately hard to moderately soft, pelloidal, partly sparry, partly Dolomitic packstone to grainstone.
2310–2320	10	LIMESTONE AND DOLOMITE – Limestone 90%, very pale orange (10YR 8/2) dominantly fine to very fine grained to rarely medium grained, moderately hard to weakly to moderately soft, pelloidal, fossiliferous, partly sparry grainstone to packstone. Dolomite 10%, moderate yellowish brown, microcrystalline to cryptocrystalline, very hard.
2320–2500	180	LIMESTONE –100% as above. Trace forams at 2330. Trace to little grayish orange (10YR 7/4) very fine grained to cryptocrystalline Dolomite. Trace Dolomite below 2400. Little Dolomitic Limestone and trace tests at 2500.
2500–2520	20	LIMESTONE AND DOLOMITE – Limestone 60%, very pale orange (10YR 8/2) medium to fine grained, moderately hard to rarely soft, pelloidal packstone with trace tests. Dolomite 40%, dark yellowish orange (10YR 6/8) medium to fine grained, anhedral to euhedral, crystals moderately cemented, partly limy.
2520–2540	20	LIMESTONE AND DOLOMITE – Limestone 60% as above. Dolomite 40% moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6) medium to very fine grained, hard, partly limy. Trace very pale orange (10YR 8/2) cryptocrystalline carbonate mudstone.
2540–2600	60	DOLOMITE AND LIMESTONE – Dolomite 70%–90%, as above. Limestone 30%–10%, very pale orange (10YR 8/2) medium to fine grained, moderately soft, weakly to moderately indurated, dominantly packstone to grainstone with minor amounts of very pale orange (10YR 8/2) carbonate mudstone.
2600–2610	10	LIMESTONE AND DOLOMITE – Limestone 50%–40%, very pale orange (10YR 8/2) medium to fine grained, moderately soft to moderately hard packstone to grainstone, 10%, very pale orange (10YR 8/2) cryptocrystalline, hard, carbonate mudstone. Trace tests. Dolomite 50%, dark yellowish orange (10YR 6/6) dominantly microcrystalline to cryptocrystalline, moderately hard to hard, partly sucrosic.
2610–2630	20	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to dark yellowish orange (10YR 6/6) fine grained to microcrystalline, hard, partly sucrosic with distinct mottles common at 2620.
2630–2680	50	DOLOMITE AND LIMESTONE – Dolomite 90%–80%, dark yellowish orange (10YR 6/6) to rarely moderate yellowish brown (10YR 5/4) fine grained to cryptocrystalline, hard, sucrosic. Limestone 10%–20%, very pale orange (10YR 8/2) medium to fine grained, soft to moderately soft, pelloidal grainstone to packstone.

Depth (ft)	Thickness (ft)	Sample Description
2680–2740	60	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) very fine grained to cryptocrystalline, grain decreasing with depth, hard to very hard sucrosic. Trace pale yellowish brown (10YR 6/2) and dusky yellowish brown (10YR 2/2) Dolomite below 2730. Pale yellowish brown component rarely slightly glauconitic at 2730.
2740–2750	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to moderately yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2) medium grained to cryptocrystalline, very well sorted, larger grains dominantly euhedral crystals, pale yellowish brown component rarely slightly glauconitic.
2750–2760	10	DOLOMITE AND LIMESTONE – Dolomite 70%; 60%as above. 10% Dark yellowish brown (10YR 4/2) to moderate yellowish brown (10YR 5/4) to rarely dusky yellowish brown (10 YR 2/2) coarse to medium grained, euhedual to subhedral rohomohedral crystals, moderately to very well indurated. Dusky yellowish brown component limy. Limestone 30%–20%, very pale orange (10YR 8/2) very fine grained, moderately hard, very well indurated wackestone. 10% very pale orange (10YR 8/2) medium to fine grained, moderately soft, pelloidal, slightly fossiliferous packstone. Trace tests.
2760–2780	20	LIMESTONE – 100%; 70% Very light gray (N8) to yellowish gray (5Y 8/1) cryptocrystalline, hard, weakly vuggy carbonate mudstone. 30% Very pale orange (10YR 8/2) medium to fine grained, moderately soft to hard, packstone to wackestone.
2780–2950	170	LIMESTONE – 100% Very pale orange (10YR 9/2) medium to fine grained, soft to moderately hard, pelloidal grainstone to packstone. Trace tests. Trace to little moderate yellowish brown (10YR 5/4) cryptocrystalline to fine grained Dolomite from 2830 to 2860.
2950–3000	50	LIMESTONE AND DOLOMITE– Limestone 70%; 60% as above. 10% Pale olive gray (5Y 7/1) cryptocrystalline, hard, carbonate mudstone vuggy and fractured at 2970, fractures and vuggs healed and filled with neomorphic calcite. Dolomite 30% moderate yellowish brown (10YR 5/4) cryptocrystalline to very fine grained, very hard.

Monitor Well Geologic Log

Appendix D
Geologic Log - (Drill Cuttings)
Dual-Zone Monitor Well MW-1
City of Pompano Beach

Depth (ft)	Thickness (ft)	Sample Description
0-10	10	SANDY LIMESTONE, SANDSTONE AND ORGANICS – Sandstone 60%, grayish yellow (5Y 8/4) to yellowish gray, medium grained to cryptocrystalline, moderately hard, partly pelloidal packstone with abundant medium grained, angular, colorless quartz. Sandstone 30%, grayish orange (5YR 7/2) fine to medium grained, moderately cemented. Organics 10%.
10-20	10	SANSTONE AND SANDY LIMESTONE – Sandstone 50%, moderate brown (5YR 4/4) fine to medium grained, friable, highly argillaceous. Sandy Limestone 50%, as above.
20–40	20	LIMESTONE – 100% Grayish orange (10YR 7/4), medium to fine grained, moderately hard, occasionally sparry, fossiliferous packstone with colorless fine grained subangular quartz. Trace shell fragments.
40–50	10	SANDY LIMESTONE – 100% Grayish orange. (10YR 7/4) medium grained, moderately hard, fossiliferous packstone with abundant colorless, fine grained, subangular quartz.
50–70	20	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone 70%, as above. Limy Sandstone 30%, very pale orange (10YR 8/2) fine to rarely coarse grained, subangular moderately hard, with little to some detrital carbonate.
70–100	30	SANDY LIMESTONE AND SAND – Sandy Limestone 90%, very pale orange (10YR 8/2) to moderate yellowish brown (10YR 5/2) fine to coarse grained, moderately hard to hard, fossiliferous mudstone to packstone with shell fragments and abundant fine to medium grained subangular quartz sand. Sand 10%, coarse to medium grained, subangular to subrounded, poorly cemented to unconsolidated
100–130	30	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone 70%, yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) coarse to fine grained, fossiliferous carbonate mudstone to packstone with shell fragments and coarse to fine grained subrounded quartz. Limy. Sandstone 30%, yellowish gray (5Y 7/2) fine to medium grained, moderately cemented with little to abundant detrital carbonate
130–150	20	LIMY SANDSTONE – 100% Greenish gray (5GY 6/1) medium to fine grained, subrounded to rounded quartz, moderately to poorly sorted moderately hard with detrital carbonate, shell fragments and little phosphorite.

Depth (ft)	Thickness (ft)	Sample Description
150–160	10	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone. 80%, light olive gray (5Y 6/1) fine to medium grained, moderately hard, fossiliferous wackestone with shell fragments and trace phosphorite. Limy Sandstone 20%, yellowish gray (5Y 7/2) fine to coarse grained, subangular, colorless quartz in calcite wackestone with shell fragments. Trace phosphorite.
160–200	40	LIMY SANDSTONE – 100% Light olive gray (5Y 6/1) coarse to very fine grained, subrounded to rounded, well sorted quartz with fine shell fragments crystalline carbonate and trace phosphorite.
200–220	20	LIMY SANDSTONE AND SANDY LIMESTONE – Limy Sandstone 90%, as above. Sandy Limestone 10%, yellowish gray (5Y 8/1) fine to medium grained, hard, fossiliferous wackestone with colorless medium to very fine grained quartz sand and trace phosphorite
220-260	40	LIMY SANDSTONE – 100% Pale olive (10Y 6/2) to light olive gray (5Y 6/1) medium to very fine grained, friable to moderately hard, angular to rounded, moderately to well sorted, slightly phosphatic quartz with 20% shell fragments and detrital carbonate.
260–300	40	LIMY SANDSTONE – 100% Light olive gray (5Y 5/2) coarse to very fine grained, moderately cemented, angular to rounded, moderately to well sorted quartz with moderate to moderately large sized shell fragments and trace phosphorite. Trace sparry mudstone at 270.
300–310	10	LIMESTONE – 100% Yellowish gray (5Y 7/2) very coarse to medium grained, moderately hard fossiliferous, highly sparry slightly phosphatic, slightly sandy packstone.
310–330	20	SANDY LIMESTONE – 100% Yellowish gray (5Y 8/1) medium to very fine grained. Moderately hard, fossiliferous, packstone with colorless, coarse to fine grained, angular to rounded quartz sand and trace phosphorite.
330–360	30	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 90%, yellowish gray (5Y 8/1) to light olive gray (5Y 5/2) medium to fine grained, moderately hard, fossiliferous wackestone with shell fragments and fine to medium grained quartz sand and trace phosphorite. Limestone 10% white (N1) medium to fine grained moderately hard sandy packstone
360–390	30	LIMY SANDSTONE – 100% Light olive gray (5Y 5/2) to light olive gray (5Y 6/1) fine to coarse grained, poorly sorted, moderately cemented, angular to subangular quartz with abundant carbonate mudstone, shell fragments and trace phosphorite.
380–400	20	LIMY SANDSTONE – 100% Light olive gray (5Y 5/2) fine grained, subangular quartz, moderately well cemented, with detrital carbonate, shell fragments and trace phosphorite.

Depth (ft)	Thickness (ft)	Sample Description
400–500	100	CLAYEY SANDY LIMESTONE – 100% Light olive gray (5Y 5/2) fine grained, moderately soft, fossiliferous wackestone with clay, fine to very fine grained quartz sand and little phosphorite. Trace coarse grained sandy packstone at 430 and 480 feet. Clay content increasing below 480 feet.
500–510	10	SANDY CLAY AND CLAYEY SANDY LIMESTONE – Sandy Clay 70%, light olive gray (5Y 5/2) soft, moderately plastic calcareous with very fine grained quartz sand and little phosphorite. Clayey Sandy Limestone 30%, as above.
510–540	30	SANDY CLAY – 100%, Light olive gray (5Y 5/2) non–plastic, moderately firm, with abundant very fine grained quartz sand.
540–580	30	SANDY CLAY AND LIMY SANDSTONE – Sandy Clay 70%, light olive gray (5Y 5/2) very soft, moderately plastic, with abundant fine grained quartz sand and little phosphorite. Limy Sandstone 30%, medium light gray (N6) fine grained, well cemented, with medium grained fossiliferous limestone and trace phosphorite.
580–600	20	SANDY CLAY – 100% Grayish olive (10Y 4/2) very soft, non–plastic, phosphatic, slightly calcareous with fine grained quartz sand.
600–630	30	SANDY CLAY AND LIMESTONE – Sandy Clay 70% to 90%, grayish olive (10Y 4/2) moderately soft, moderately plastic, calcareous, phosphatic with very fine grained quartz sand. Limestone 30% to 10%, pale greenish yellow (10Y 8/2) very fine to medium grained hard sparry packstone.
630–650	20	CLAYEY SAND – 100% Yellowish gray (5Y 7/2) very fine grained, very poorly cemented to unconsolidated quartz with abundant clay and trace phosphorite.
650–670	20	SANDY CLAY – 100% Pale olive (10Y 6/2) moderately stiff, plastic slightly phosphatic with very fine grained quartz sand.
670–700	30	CLAYEY SAND – 100% Yellowish gray (5Y 7/2) very fine grained, unconsolidated quartz with abundant clay.
700–730	30	SANDY CLAY – 100% Yellowish gray (5Y 7/2) moderately soft to firm, moderately plastic, calcareous, slightly phosphatic with very fine grained quartz sand.
730–760	30	SANDY CLAY AND LIMESTONE – Sandy Clay 60% to 70% as above. Limestone. 40% to 30% yellowish gray (5Y 7/2) fine to medium grained, moderately hard sparry wackestone.
760–770	10	CLAYEY LIMESTONE – 100% Yellowish gray (5Y 7/2) medium grained, soft, pelloidal packstone.
770–800	30	SANDY CLAY – 100% Yellowish gray (5Y 7/2) to light olive gray (5Y 5/2) stiff to hard, moderately plastic, calcareous, with very fine grained quartz sand.

Depth (ft)	Thickness (ft)	Sample Description
800–910	110	SANDY CLAY – 100% Pale olive (10Y 6/2) stiff to hard, moderately plastic with very fine grained quartz sand. Trace chert at 840
910–920	10	SANDY CLAY AND LIMESTONE – Sandy Clay 60%, as above. Limestone 40%, pale greenish yellow (10Y 8/2) very fine grained, moderately hard packstone. Trace olive gray (5Y 3/2) very fine grained very hard chert
920–930	10	LIMESTONE AND PHOSPHORITE – Limestone 80%, yellowish gray (5Y 7/2) fine to very fine grained, very soft carbonate marl. Phosphorite 20%, light olive brown (5Y 5/6) medium grained, unconsolidated
930–940	10	LIMY SANDY CLAY – 100% Pale olive (10Y 6/2) firm, plastic, with very fine grained quartz sand, and carbonate marl as above
940–950	10	SANDY CLAYEY LIMESTONE – 100% Yellowish gray (5 Y 7/2) fine to medium grained, very soft to moderately soft, phosphatic wackestone with fine to medium grained quartz sand
950–970	20	SANDY CLAY AND SANDY CLAYEY LIMESTONE – Sandy Clay 70%, pale olive (10Y 6/2) soft, plastic with very fine grained quartz sand. Sandy Clayey Limestone 30%, as above.
970–1000	30	CLAYEY LIMESTONE AND SANDY CLAY – Clayey Limestone 70%, light olive gray (5Y 5/2) medium grained, hard fossiliferous, phosphatic wackestone. Sandy Clay 30%, as above.
1000–1110	110	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained, moderately hard packstone with trace forms. 20% Pale yellowish gray (5Y 9/1) cryptocrystalline, moderately hard carbonate mudstone.
1110–1120	10	LIMY SANDSTONE AND LIMESTONE – Limy Sandstone 70%, grayish olive (10Y 4/2) fine grained, moderately to poorly cemented, slightly phosphatic with detrital carbonate. Limestone 30%, light yellowish gray (5Y 6/2) fine grained, hard sparry to very sparry wackestone with molds and tests.
1120–1130	10	LIMESTONE – 100% Very pale orange (10YR 8/2) medium grained, moderately soft pelloidal packstone.
1130–1150	20	LIMESTONE – 100%; 80% Medium bluish gray (5B 5/1) microcrystalline to cryptocrystalline, hard sparry carbonate mudstone with little neomorphic calcite. 20% as above.
1150–1160	10	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) medium grained, moderately soft to moderately hard packstone with few forams
1160–1200	40	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) medium grained, moderately soft to moderately hard packstone with few forams.

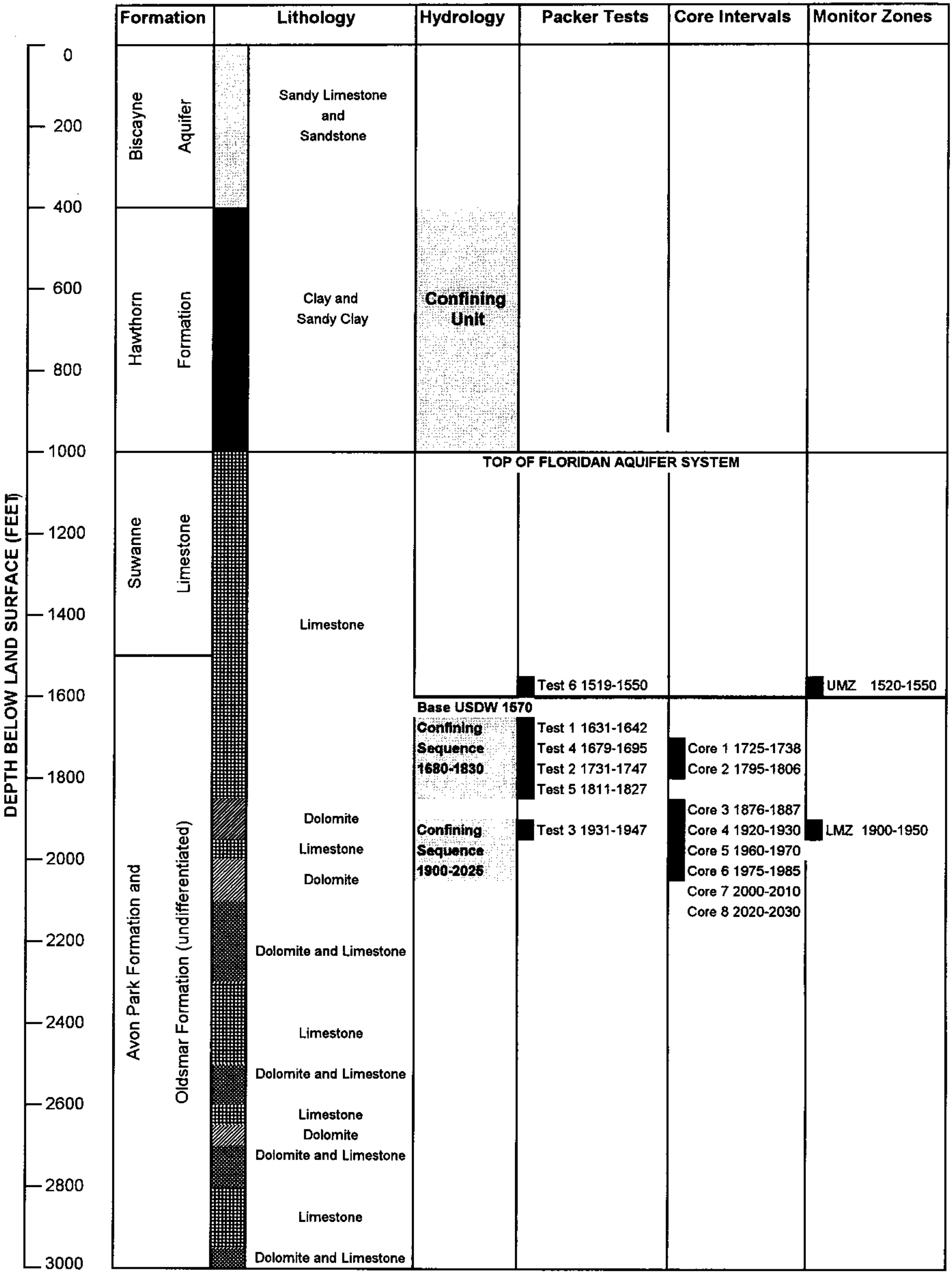
Depth (ft)	Thickness (ft)	Sample Description
1200–1270	70	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) as above. 30% Yellowish gray (5Y 8/1) fine grained moderately soft to soft, slightly vuggy wackestone. Trace light olive gray hard carbonate mudstone at 1160.
1270–1380	110	LIMESTONE – 100% Pale yellowish brown (10YR 6/2) to yellowish gray (5Y 8/1) medium to fine grained, moderately soft packstone to rarely grainstone with 10% to 20% forams. Trace yellowish gray (5Y 8/1) highly vuggy carbonate mudstone at 1320. Trace medium light gray (N6) fine grained hard wackestone at 1360. Trace test at 1370.
1380–1410	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained moderately soft pelloidal packstone. 20% Light gray (N7) hard carbonate mudstone. Trace forams. Trace interbedded Dolomitic Limestone at 1400.
1410–1430	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1) medium to fine grained, moderately soft, pelloidal packstone. 20% Very light gray (N8) cryptocrystalline, moderately hard carbonate mudstone. 10% Dark gray (N7) medium grained, hard, fossiliferous wackestone. Abundant forams.
1430 –1460	30	LIMESTONE – 100%; 80%–60% Yellowish gray (5Y 8/1) coarse to fine grained, moderately soft to moderately hard, pelloidal packstone to grainstone. 10%–20% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone. 10%–20% Very light gray (N8) as above.
1460–1480	20	LIMESTONE AND DOLOMITE – Limestone 90%; 70% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft to moderately hard, pelloidal packstone/grainstone with trace Dolomitic laminations. 20% Medium dark gray (N4) to medium light gray (N6) fine grained, moderately hard, vuggy wackestone. Dolomite 10%, dark yellowish brown (10YR 4/2) microcrystalline, hard sucrossic.
1480–1500	20	LIMESTONE AND DOLOMITE – Limestone 90%; 70% Very pale orange (10YR 9/2) cryptocrystalline, moderately hard, very slightly vuggy carbonate mudstone. 30% Very pale orange (10YR 8/2) to light olive gray (5Y 6/1) medium to coarse grained, pelloidal packstone to grainstone. 20% Medium gray (N5) fine grained, hard wackestone. Dolomite 10%–20% as above.
1500–1510	10	LIMESTONE AND SANDSTONE – Limestone 70% as above. Sandstone 30%, moderate yellowish brown (10YR 5/4) fine to very fine grained, moderately cemented. Trace Dolomite as above.
1510–1520	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2) fine to medium grained, moderately soft, fossiliferous packstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, carbonate mudstone. Trace to little forams. Trace Sandstone as above.

Depth (ft)	Thickness (ft)	Sample Description
1520–1530	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) medium grained, moderately soft to moderately hard, fossiliferous, partly sparry packstone to rarely grainstone. 20% White (N9) to very light gray (N8) cryptocrystalline, moderately hard, slightly vuggy, carbonate, mudstone. Few forams and tests. Trace light olive gray (5Y 6/1) microcrystalline hard Dolomite.
1530–1550	20	LIMESTONE AND DOLOMITE – Limestone 70% as above. Dolomite 30% moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) fine grained to microcrystalline, moderately hard to hard. Trace fine grained, slightly phosphatic Sandstone. Trace to few forams.
1550–1560	10	LIMESTONE – 100% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, very soft to soft packstone with few forams. Trace Dolomite as above.
1560–1580	20	LIMESTONE – 100%; 90% As above. 10% Medium dark gray (N4) very fine grained wackestone/packstone.
1580–1590	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) medium to fine grained, moderately soft packstone to grainstone. 20% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard carbonate mudstone. 20% Pale yellowish brown (10YR 6/2) to grayish brown (5YR 3/2) fine to medium grained, hard, occasionally fossiliferous wackestone. Few flat forams up to 10 mm in diameter.
1590–1600	10	LIMESTONE – 100%; 90% Grayish orange (10YR 7/4) fine to medium grained, moderately soft, pelloidal, slightly fossiliferous packstone. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard carbonate mudstone. Few forams and tests. Trace Dolomitic Limestone.
1600–1610	10	LIMESTONE – 100%; 80% Grayish orange (10YR 7/4) to very pale orange (10YR 8/2) fine grained, moderately soft to moderately hard, rarely slightly Dolomitic packstone. 20% Medium dark gray (N4) fine grained, hard wackestone to carbonate mudstone. Trace forams. Trace white (N9) very soft carbonate marl.
1610–1630	20	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) fine to medium grained, moderately soft packstone. 30% Light olive gray (5Y 8/1) to light olive gray (5Y 6/1) medium grained, hard, fossiliferous wackestone to carbonate mudstone.
1630–1640	10	LIMESTONE – 100% Grayish orange (10YR 7/4) fine grained, soft to moderately soft packstone with abundant forams.
1640–1650	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) fine to medium grained, moderately hard packstone. 10% Pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy carbonate mudstone.

Depth (ft)	Thickness (ft)	Sample Description
1650–1660	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) as above. 30% Medium gray (N5) dominantly fine to medium grained, micritic, locally vuggy wackestone. 10% Pale yellowish brown (10YR 6/2) as above.
1660–1670	10	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) fine grained, moderately soft wackestone. 30% Medium dark gray (N4) to olive gray (5Y 4/1) fine grained, hard, slightly vuggy, micritic wackestone. 10% Yellowish gray (5Y 8/1) cryptocrystalline, hard carbonate mudstone. Trace tests.
1670–1680	10	LIMESTONE– 100% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) fine grained, moderately soft, slightly vuggy packstone. Trace to little medium dark gray (N4) wackestone as above.
1680–1700	20	LIMESTONE– 100%; 50% Olive gray (5Y 4/1) to dark gray (N3) fine to medium grained, soft to moderately hard, fossiliferous packstone to wackestone. 40% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1) fine to medium grained, moderately soft, pelloidal packstone. 10% Yellowish gray (5Y 8/1) to light gray (N7) cryptocrystalline, hard carbonate mudstone. Trace to few forams and test.
1700–1710	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4) fine to very fine grained, moderately soft, locally slightly Dolomitic, packstone to wackestone. 10% Pale olive gray (5Y 6/1) cryptocrystalline, hard, slightly vuggy carbonate mudstone. Few forams and test.
1710–1740	30	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2) medium grained, moderately hard, fossiliferous, partly vuggy, partly slightly Dolomitic grainstone to packstone. 20% Yellowish gray (5Y 8/1) hard, microcrystalline to cryptocrystalline, carbonate mudstone. 10% Medium gray (N5) fine grained, moderately hard to hard, fossiliferous wackestone. Few forams and test.
1740–1770	30	LIMESTONE – 100%; 70% yellowish gray (5Y 8/1) to occasionally olive gray (5Y 4/1) fine to very fine grained, moderately soft to hard, well cemented, fossiliferous, partly sparry packstone. 30% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) very fine grained, partly vuggy wackestone to carbonate mudstone. Trace to few forams and test. Trace Dolomitic Limestone and neomorphic calcite.
1770–1790	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1) very fine grained, moderately hard, vuggy wackestone. 30% Yellowish gray (5Y 8/1) to occasionally olive gray (5Y 4/1) fine to very fine grained, moderately soft to hard, well cemented, fossiliferous, partly sparry packstone
1790–1810	20	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) to light gray (N7) fine grained, hard wackestone. 40% Yellowish gray (5Y 8/1) fine to medium grained, moderately soft packstone. Trace soft Dolomitic packstone. Trace to few forams and tests.

Depth (ft)	Thickness (ft)	Sample Description
1810–1840	30	LIMESTONE AND DOLOMITE – Limestone 90%–80%; 60% Pale yellowish brown (10YR6/2) to medium light gray (N6) fine grained, moderately hard wackestone to mudstone. 40% Pale yellowish brown (10YR 6/2) to medium light gray (N6) medium to fine grained, moderately soft packstone, percentage decreasing with depth. Dolomite 10%–20% Dark yellowish brown (10YR 4/2) very fine grained, fossiliferous, occasionally limy, percentage increasing with depth. Trace Dolomitic Limestone. Few tests and forams.
1840–1850	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to rarely grayish black (N2) fine grained to microcrystalline, moderately hard to very hard, sucrosic. Trace very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone
1850–1880	30	DOLOMITE AND LIMESTONE – Dolomite 70%, as above. Limestone 30%, very pale orange (10YR 8/2) fine to very fine grained, moderately hard, rarely micritic packstone to wackestone.
1880–1900	20	DOLOMITE AND DOLOMITIC LIMESTONE – Dolomite 70%; 60% dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2), very fine grained, very hard, weakly vuggy, sucrosic. 40% Pale yellowish brown (10YR 6/2) cryptocrystalline, very hard. Dolomitic Limestone 30%, pale yellowish brown (10YR 6/2) cryptocrystalline, hard, slightly vuggy, carbonate mudstone with very fine grained Dolomite inclusions.
1900–1920	20	LIMESTONE, DOLOMITE AND DOLOMITIC LIMESTONE – Limestone 70%, very pale orange (10YR 8/2) fine to rarely medium grained, dominantly hard to rarely moderately hard, well indurated, occasionally dolomitic packstone to rarely wackestone. Dolomite 20%, dark yellowish brown (10YR 4/2) to dusky yellowish brown (10YR 2/2) fine grained to microcrystalline, very hard. Dolomitic Limestone 10%, pale yellowish brown (10YR 6/2) cryptocrystalline, very hard carbonate mudstone with microcrystalline Dolomite inclusions.
1920–1940	20	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) medium grained, hard, well indurated, fossiliferous packstone with forams and tests. 30% Very pale orange (10YR 8/2) coarse to medium grained, moderately hard fossiliferous grainstone with forams. 10% Very pale orange (10YR 8/2) cryptocrystalline, hard weakly vuggy carbonate mudstone with trace neomorphic calcite.
1940–1950	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2) cryptocrystalline, hard, rarely very weakly vuggy carbonate mudstone. 20% Very pale orange (10YR 8/2) hard, very fine grained wackestone. 10% Olive gray (5Y 4/1) cryptocrystalline, hard micritic mudstone. 10% White (N9) very soft, fossiliferous carbonate marl.

CITY OF POMPANO BEACH WTP
HYDROGEOLOGIC COLUMN



Project No. 40368
hydrogeologic column.xls

City of Pompano Beach
Concentrate Disposal Well

APPENDIX E

CORES

APPENDIX E
GEOLOGIC LOG - CORE #1
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	**Sample Description**
1725.0 – 1732.0	No Recovery
1732.0 – 1734.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, coarse grained, soft, very well indurated wackestone with fossils, forams and trace small (<1 mm) medium gray (N5) carbonate mudstone inclusions. Sharp wavy lower contact.
1734.0 – 1734.3	LIMESTONE (100%) medium light gray (N6) massive, moderately soft, cryptocrystalline, carbonate mudstone with grayish orange (10YR 7/4) medium grained , soft packstone lenses common. Upper 25mm of section vuggy with vuggs generally 1mm in diameter rarely to 5mm. Indistinct lower contact.
1734.3 – 1735.1	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, hard, very well indurated, vuggy carbonate mudstone. Vuggs generally < 1mm in diameter. Sharp horizontal lower contact.
1735.1 – 1736.7	LIMESTONE (100%) yellowish gray (5Y 8/1) dominantly very fine grained to medium grained grading with depth to very fine grained, moderately soft, very well indurated wackestone. Degree of induration increasing with depth. Upper 0.5 feet of section weakly vuggy with forams common. Sharp horizontal lower contact.
1736.7– 1737.0	LIMESTONE (100%), medium light gray (N6), poorly indurated, massive fine to very fine grained soft carbonate mudstone. Irregular lower contact.
1783.5 – 1784.0	LIMESTONE (100%) yellowish gray (5Y 7/1) massive, moderately soft to moderately hard, cryptocrystalline, moderately vuggy carbonate mudstone. Vuggs generally <5mm in diameter. Occasional vertical burrows up to 20mm in length generally 2-5 mm in diameter.

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #2
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	**Sample Description**
1795.0 – 1795.8	No Recovery
1795.8 – 1798.0	LIMESTONE (100%) massive, yellowish gray (5Y 8/1) dominantly very fine to coarse grained, very well indurated, poorly sorted moderately soft packstone.
1798.0 – 1798.7	LIMESTONE AND DOLOMITE – Limestone (95%) yellowish gray (5Y 8/1) very fine to medium grained, grain size increasing with depth, very well indurated, moderately soft, weakly vuggy packstone with trace medium gray (N5) lenses in upper portion of section. Dolomite (5%) dark yellowish brown (10YR 4/2) to dusky yellowish brown (10 YR 2/2) cryptocrystalline occurring as thin wavy laminations.
1798.7 – 1800.5	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, moderately soft, medium grained, very well indurated packstone. Sharp horizontal lower contact.
1800.5 – 1800.9	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, very fine to fine grained, moderately hard, very well indurated, moderately vuggy (vuggs generally 1mm in diameter to rarely 5mm in diameter) wackestone.
1800.9– 1802.9	LIMESTONE (100%), yellowish gray (5Y 8/1) generally massive, weakly bedded in upper 0.2 feet of section, very fine to medium grained, poorly sorted packstone to wackestone. Sharp irregular lower contact.
1802.9 – 1803.2	LIMY DOLOMITE (100%) medium light gray (N6) to pale yellowish brown (10YR 6/2) bedded, cryptocrystalline, hard, weakly vuggy. Sharp wavy lower contact.
1803.2 – 1803.5	LIMESTONE (100%) yellowish gray (5Y 8/1) cryptocrystalline, hard, vuggy (vuggs generally less than 1 mm in diameter) carbonate mudstone with trace fossills to 5 mm in diameter and trace casts.
1803.5 – 1804.9	LIMESTONE (100%) yellowish gray (5Y 8/1) very fine to fine grained, moderately soft, very well indurated packstone to wackestone.

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #3
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	Sample Description
1876.5 – 1877.5	No Recovery
1877.5 – 1879.2	DOLOMITE (100%) medium dark gray (N4) to light olive gray (5Y 6/1) to yellowish gray (5Y 7/2) cryptocrystalline, generally massive, very hard, weakly vuggy with vuggs generally 1mm to 5mm in diameter lined with microcrystalline crystals. Vugg size generally increasing with depth.
1879.2 – 1879.6	LIMY DOLOMITE (100%) moderate yellowish brown (10YR 5/4) massive, microcrystalline, very hard to hard, hardness decreasing with depth, weakly vuggy, vuggs generally 1mm in diameter. Carbonate content increasing with depth.
1879.6 – 1880.0	LIMESTONE (100%) light yellowish gray (5Y 9/1) massive, very fine grained to microcrystalline, moderately soft, very well indurated, slightly sparry packstone
1880.0 – 1880.2	LIMESTONE (100%) 70% light olive gray (5Y 6/1) massive, microcrystalline, hard highly vuggy crystalline carbonate. 30% light yellowish gray (5Y 9/1) microcrystalline, soft to very soft carbonate marl.
1880.2– 1880.3	LIMY DOLOMITE (100%) olive gray (5Y 4/1) massive microcrystalline to cryptocrystalline, very hard, vuggy, vuggs lined with neomorphic calcite crystals.
1880.3 – 1881.2	DOLOMITE (100%) moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) generally massive, dominantly cryptocrystalline to very fine grained, very hard, vuggy, vuggs lined with very fine grained crystals.
1881.2 – 1884.1	DOLOMITE (100%) medium dark gray (N4) to moderate yellowish brown (10YR 5/4) generally massive with occasional faint bedding features, microcrystalline to cryptocrystalline, very hard, weakly vuggy with vuggs generally < 1mm in diameter to rarely 5mm in diameter.
1884.1 – 1884.5	DOLOMITE (100%) grayish orange (10YR 7/4) massive, very fine grained, very hard, weakly vuggy with vuggs generally < 1mm in diameter.

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #4
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	**Sample Description**
1920.0 – 1920.3	DOLOMITE (100%) pale yellowish brown (10YR 6/4) massive, cryptocrystalline, very hard, vuggy. Vuggs generally < 1mm in diameter to rarely 3mm in diameter.
1920.3 – 1926.5	LIMESTONE (100%) yellowish gray (5Y 8/1) medium to fine grained, moderately soft to moderately hard, massive, slightly fossiliferous, very well indurated packstone. Trace molds, few to some forams, foram content increasing with depth.
1926.5 – 1930.0	No recovery

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #5
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	Sample Description
1960.0 – 1961.4	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine grained, moderately soft, very well indurated packstone/wackestone. Sharp irregular lower contact.
1961.4 – 1962.1	LIMESTONE (100%) medium light gray (N6) to medium gray (N5) massive, cryptocrystalline, hard to very hard, weakly vuggy (vuggs generally 1mm in diameter) carbonate mudstone. Transitional lower contact through bottom 0.1 feet of unit.
1962.1 – 1966.0	LIMESTONE (100%) yellowish gray (5Y 8/1) generally massive, with faint laminations in upper 0.1 feet of unit and from 1,965.2 to 1,965.9, medium to very fine grained, grain size generally decreasing with depth, moderately soft, very well indurated packstone. Thick (10mm) light gray lamination at 1,923.4. Thin (1mm) Dolomite lens at 1,923.5. Sharp wavy lower contact
1966.0 – 1967.3	LIMESTONE (100%) yellowish gray (5Y 7/2) generally massive, very fine to coarse grained, moderately hard, moderately indurated, weakly vuggy wackestone. Transitional lower contact (laminated) through lower 0.4 feet of unit.
19673 – 1969.0	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, medium to fine grained, moderately soft, very well indurated packstone.

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #6
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	**Sample Description**
1975.0 – 1975.9	LIMESTONE (100%) light yellowish gray (5Y 9/1) generally massive, medium to fine grained, moderately soft, very well indurated packstone with trace thin (1mm) Dolomitic laminations. Sharp wavy lower contact.
1975.9 – 1976.2	DOLOMITE (100%) pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2) weakly laminated, microcrystalline to cryptocrystalline, very hard, very weakly vuggy, vuggs generally 1mm in diameter.
1976.2 – 1976.4	DOLOMITE AND LIMESTONE – Dolomite 60%, dark gray (N3) microcrystalline to cryptocrystalline, very hard, weakly vuggy. Limestone 40%, very light gray (N8) occurring as laminations and inclusions, cryptocrystalline, hard carbonate mudstone. Sharp horizontal lower contact.
1976.4 – 1980.1	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, medium grained, moderately soft, very well indurated packstone. Medium gray (N5) 5mm carbonate mudstone lens at 1,979.8. Sharp horizontal lower contact.
1980.1 – 1980.5	LIMESTONE AND DOLOMITE – Limestone 90%, yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2) laminated, medium grained, soft, very well indurated packstone/wackestone. Dolomite 10%, dark yellowish brown (10YR 4/2) occurring as laminations, cryptocrystalline, moderately soft. Dolomite content decreasing with depth.
1980.5 – 1981.2	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, fine grained, moderately soft, very well indurated packstone.
1981.2 – 1981.6	DOLOMITE AND LIMESTONE – Dolomite 70%, medium dark gray (N4) cryptocrystalline, very hard, weakly vuggy. Limestone 30%, light gray (N7) lenses and inclusions, coarse to fine grained, hard wackestone.
1981.6 – 1982.2	LIMESTONE (100%) yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2) thickly laminated, medium grained, soft, very well indurated packstone/wackestone.
1982.2 – 1983.4	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, fine grained, moderately hard to moderately soft, hardness decreasing with depth, very

well indurated packstone with trace to few medium light gray (N6) hard carbonate mudstone lenses and inclusions.

1983.4 – 1994.1 DOLOMITIC LIMESTONE AND LIMY DOLOMITE (100%) yellowish gray (5Y 7/2) grading with depth to dark yellowish brown (10YR 4/2) massive, fine grained to cryptocrystalline, hard, very well indurated, very weakly vuggy packstone grading with depth to Limy Dolomite.

End of Core

APPENDIX E
GEOLOGIC LOG - CORE #7
CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	**Sample Description**
2000.0 – 2001.4	DOLOMITE (100%) dominantly pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2) massive, microcrystalline to cryptocrystalline, very hard, weakly vuggy, vuggs generally 1mm in diameter to rarely 3mm in diameter. Faint mottles in upper 0.2 feet of unit.
2001.4 – 2002.3	DOLOMITIC LIMESTONE AND DOLOMITE – Dolomitic Limestone 70%, yellowish gray (5Y 7/2) massive, cryptocrystalline, very hard, very well indurated, weakly to moderately vuggy, highly Dolomitic carbonate mudstone. Dolomite 30%, moderate yellowish brown (10YR 5/4) very fine grained to microcrystalline, sucrosic, very hard. Sharp horizontal lower contact.
2002.3 – 2008.0	DOLOMITE (100%) pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4) generally massive with few localized laminations, cryptocrystalline to microcrystalline, very hard, dominantly weakly to moderately weakly vuggy with highly vuggy zone in upper 0.2 feet of section.
2008.0 – 2009.3	LIMY DOLOMITE (100%) yellowish gray (5Y 7/2) to pale yellowish brown (10YR 6/2) thinly bedded with faint to moderately prominent bedding features, cryptocrystalline, very hard. Dominantly very well indurated, locally vuggy, vuggs generally 2mm–5mm in diameter lined with euhedral rhombs.

End of Core

APPENDIX E

GEOLOGIC LOG - CORE #8

CONCENTRATE DISPOSAL WELL IW-1
CITY OF POMPANO BEACH

Depth (ft)	Sample Description
2020.0 – 2020.9	LIMY DOLOMITE (100%) yellowish gray (5Y 8/1) to light olive gray (5Y 6/1) massive, cryptocrystalline, very hard, yellowish gray component occurring as very coarse grained inclusions and small lenses, weakly vuggy, vuggs generally 1mm in diameter. Few faint vertical fractures.
2020.9 – 2022.7	DOLOMITE (100%) pale yellowish brown (10YR 6/2) massive, microcrystalline to cryptocrystalline, very hard, very weakly vuggy, vuggs generally 1mm in diameter to moderately vuggy, vuggs 2mm to 4mm in diameter. Fully healed vertical and low angle fractures from 2,022.0 feet to 2,022.7 feet.
2022.7 – 2023.2	DOLOMITE (100%) 60% moderate yellowish brown (10YR 5/4) very fine grained, very hard, occurring as inclusions and small lenses with trace vuggs. 40% dark yellowish brown (10YR 4/2) cryptocrystalline, very hard.
2023.2 – 2024.4	DOLOMITE (100%) moderate yellowish brown (10YR 5/4) massive, cryptocrystalline, very hard, very well indurated to locally very weakly vuggy, occasional vertical to high angle fully healed fractures.
2024.4 – 2024.8	DOLOMITE (100%) moderate yellowish brown (10YR 5/4) to yellowish gray (5Y 8/1) laminated to thinly bedded, very fine grained to cryptocrystalline, very hard.
2024.8 – 2026.9	DOLOMITE (100%) moderate yellowish brown (10YR 5/4) microcrystalline to cryptocrystalline, very hard, very weakly vuggy, vuggs generally < 1mm in diameter to rarely 3mm in diameter
2026.9 – 2027.2	DOLOMITE (100%) olive gray (5Y 4/1) to rarely pale yellowish brown (10YR 6/2) massive, very fine grained to cryptocrystalline, very hard, moderately vuggy, vuggs generally 1mm to 3mm in diameter.

End of Core

Core Laboratory Analyses

FILE
40368

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

November 14, 2001
File Number 01-131

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, Florida 33908

Attention: Mr. Edward McCullers

Subject: Laboratory Testing, Rock Core Specimens, City of Pompano Beach Concentrate Disposal Well IW-1

Gentlemen:

As requested, permeability, unconfined compression and specific gravity tests have been completed on nineteen rock core samples provided for testing by your firm from the City of Pompano Beach Concentrate Disposal Well IW-1. The permeability tests were performed in general accordance with ASTM Standard D 5084 "Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible-Wall Permeameter" using the constant-head method (Method A) and the falling-head with increasing tailwater level method (Method C). The unconfined compression tests were performed in general accordance with ASTM Standard D 2938 "Unconfined Compressive Strength of Intact Rock Core Specimens". Specific gravity was determined in general accordance with ASTM Standard D 854 "Specific Gravity of Soils".

Permeability Tests

The permeability test results are presented in Table 1 and Figure 1. The vertical permeability tests were performed first on specimens maintained at the as-received diameter and cut to lengths of 6.1 to 12.4 cm. After completing the vertical permeability tests, horizontal permeability test specimens were obtained by coring 5.0 cm diameter cylinders from the vertical specimens. The horizontal specimens were trimmed to lengths of 3.0 to 8.4 cm to provide flat, parallel ends. Since the vertical permeability test specimens were cored upon completion of testing to obtain horizontal permeability test specimens, the final moisture contents of the vertical test specimens were not measured. The dry densities and degrees of saturation of the vertical permeability test specimens, therefore, were estimated using final moisture contents from the corresponding horizontal permeability test specimens.

The vertical permeability test specimens were air-dried, deaired under vacuum, and then saturated with deaired tap water from the bottom upward while still under vacuum. After testing, the vertical specimens were maintained submerged in water until cored for the horizontal specimens and retested for measurement of horizontal hydraulic conductivity. Each specimen was mounted in a triaxial-type permeameter and encased within a latex membrane. The specimens were confined using an average isotropic effective confining stress of 30 lb/in^2 and permeated with deaired tap water under a back-pressure of 70 or 160 lb/in^2. Satisfactory saturation was verified by a B-factor equal to or greater than 95 percent, or a B-factor that remained relatively constant for two consecutive increments of applied cell pressure. The inflow to and outflow from each specimen were monitored with time, and the hydraulic conductivity was calculated for each recorded flow increment. The tests were continued until steady-state flow conditions were obtained, as evidenced by an outflow/inflow ratio between 0.75 and 1.25, and until stable values of hydraulic conductivity were measured.

The final degree of saturation was calculated upon completion of testing using the final dry mass, moisture content and volume, and the measured specific gravity. Although some of the calculated final degrees of saturation are low (i.e. less than 95%), the B-factors indicate satisfactory saturation. The calculated final degrees of saturation are potentially affected by occluded voids within the specimens, surface irregularities, and the use of final moisture contents for vertical permeability test specimens from corresponding horizontal permeability test specimens.

Specific Gravity Tests

The specific gravity of each sample was determined on a representative approximately 100 gram specimen ground to pass the U.S. Standard No. 40 sieve. The specific gravity measured on each sample is presented in Table 1.

Total Porosity

The total porosity, n, of each permeability test specimen was calculated using the measured dry density, γ_d, and measured specific gravity, G_s, from the equation: $n = 1 - [\gamma_d/(G_s)(\gamma_w)]$ where γ_w = unit weight of water. The calculated total porosities are presented in Table 1.

Unconfined Compression Tests

Sufficient core lengths were provided to perform unconfined compression tests on five of the samples. The specimens were cored to a diameter of 5.0 cm and trimmed to lengths of 9.9 to 10.3 cm to provide a length to diameter ratio of approximately 2, and then capped with sulfur capping compound. The specimens were loaded at a constant rate of axial deformation of 0.013 cm/minute. The specimens failed in 5.2 to 14.9 minutes in accordance with ASTM Standard D 2938 criteria of between 2 and 15 minutes. The unconfined compressive strength and Young's modulus determined from each test are summarized in Table 2. The stress-strain curves are presented in Figures 2 through 6.

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

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

Shawkat Ali
Shawkat Ali, Ph.D., P.E.
Project Engineer

Thomas Ingra
Thomas S. Ingra, P.E.
Senior Project Engineer
Florida Registration No. 31987

Youngquist Brothers, Inc.
File Number 01-131
November 14, 2001

Table 1

PERMEABILITY TEST RESULTS
CITY OF POMPANO BEACH CONCENTRATE DISPOSAL INJECTION WELL IW-1

Core No.	Core Depth Interval (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\bar{\sigma}_c$ (lb/in^2)	u_b (lb/in^2)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
					Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft^3)	n					w_c (%)	γ_d (lb/ft^3)	S (%)	
2	1795.8 -1796.3	A A	Vertical Horizontal	2.73	10.54 7.68	9.66 5.04	22.1 21.9	103.2 105.3	0.39 0.38	30 30	70 70	90** 93**	13 18	22.1 † 22.1	103.2 105.3	93 98	4.6×10^{-5} 6.8×10^{-5}
	1796.3 - 1796.9	A A	Vertical Horizontal	2.72	11.89 8.02	9.60 5.04	21.5 21.3	105.4 106.3	0.38 0.37	30 30	70 70	88** 85**	13 28	21.5 † 21.5	105.4 106.3	96 98	4.8×10^{-5} 5.6×10^{-5}
	1801.9 - 1802.6	A A	Vertical Horizontal	2.71	10.36 7.80	9.52 5.04	19.5 19.3	110.9 110.3	0.34 0.35	30 30	70 70	89** 65**	13 28	19.5 † 19.5	110.9 110.3	100 99	2.5×10^{-5} 9.8×10^{-6}
3	1878.5 -1879.1	A A	Vertical Horizontal	2.85	7.14 8.00	9.95 5.04	1.3 1.5	168.0 169.9	0.06 0.04	30 30	160 160	96 76**	24 123	1.6 † 1.6	168.0 169.9	80 100	2.8×10^{-8} 3.5×10^{-10}
	1880.1 - 1880.7	A A	Vertical Horizontal	2.86	10.34 8.11	9.96 5.03	4.6 4.4	156.8 156.0	0.12 0.13	30 30	160 160	94** 100	68 23	4.8 † 4.8	156.8 156.0	100 96	1.1×10^{-8} 3.0×10^{-7}
4	1922.3 -1922.7	C C	Vertical Horizontal	2.73	9.15 8.36	9.79 5.04	24.2 23.3	100.7 100.9	0.41 0.41	30 30	70 70	96 92**	1 2	24.2 † 24.2	100.7 100.9	96 96	7.5×10^{-4} 8.9×10^{-4}
	1925.1 - 1925.6	C C	Vertical Horizontal	2.72	9.76 7.79	9.80 5.04	21.5 21.4	103.3 104.0	0.39 0.39	30 30	70 70	95 62**	1 1	21.5 † 21.5	103.3 104.0	91 92	1.1×10^{-3} 2.5×10^{-3}
5	1960.0 - 1960.6	A A	Vertical Horizontal	2.74	12.40 7.79	9.80 5.03	19.9 19.9	108.0 109.2	0.37 0.36	30 30	70 70	90** 88**	12 9	19.9† 19.9	108.0 109.2	94 97	2.7×10^{-5} 7.7×10^{-5}
	1962.5 - 1963.4	A A	Vertical Horizontal	2.75	11.15 8.40	9.76 5.04	18.5 18.3	111.3 111.5	0.35 0.35	30 30	70 160	81** 66**	13 37	18.5† 18.5	111.3 111.5	94 94	1.6×10^{-5} 2.8×10^{-5}
	1965.2 - 1966.0	A A	Vertical Horizontal	2.72	8.23 7.91	9.71 5.04	16.7 16.7	114.8 115.3	0.32 0.32	30 30	70 160	82** 66**	18 22	16.7† 16.7	114.8 115.3	95 96	1.9×10^{-6} 6.5×10^{-5}
	1967.0 - 1967.4	C A	Vertical Horizontal	2.73	6.08 7.90	9.74 4.99	21.2 20.5	107.1 106.8	0.37 0.37	30 30	70 70	84** 100	2 1	21.2 † 21.2	107.1 106.8	98 97	2.9×10^{-4} 2.2×10^{-3}
6	1979.0 - 1979.5	A C	Vertical Horizontal	2.74	10.48 7.93	9.66 5.04	21.2 21.1	107.7 106.6	0.37 0.38	30 30	70 70	91** 61**	12 2	21.2 † 21.2	107.7 106.6	99 96	4.6×10^{-5} 3.0×10^{-4}

Table 1 (Continued)

PERMEABILITY TEST RESULTS
CITY OF POMPANO BEACH CONCENTRATE DISPOSAL INJECTION WELL IW-1

Core No.	Core Depth Interval (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\overline{\sigma}_c$ (lb/in^2)	u_b (lb/in^2)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
					Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft^3)	n					w_c (%)	γ_d (lb/ft^3)	S (%)	
6	1982.3 - 1982.9	A	Vertical	2.73	11.68	9.80	14.8	118.5	0.30	30	160	78**	15	15.0 †	118.5	94	5.3×10^{-6}
		A	Horizontal		7.92	5.05	13.9	119.8	0.30	30	70	90**	19	15.0	119.8	97	9.4×10^{-6}
	1983.3 -1984.1	A	Vertical	2.77	7.71	9.86	8.2	139.5	0.19	30	70	74**	20	8.3 †	139.5	96	5.4×10^{-7}
		A	Horizontal		8.10	5.05	8.2	138.8	0.20	30	70	82**	23	8.3	138.8	94	3.5×10^{-7}
7	2000.0 - 2001.1	A	Vertical	2.83	9.73	10.08	1.7	156.9	0.11	30	160	92**	69	3.3 †	156.9	74	7.4×10^{-9}
		A	Horizontal		7.98	5.03	2.8	157.5	0.11	30	160	75**	123	3.3	157.5	77	6.0×10^{-10}
	2002.5 - 2003.0	A	Vertical	2.85	10.65	10.10	1.4	164.1	0.08	30	160	92**	55	1.4 †	164.1	49	6.1×10^{-9}
		A	Horizontal		8.23	5.03	1.1	163.8	0.08	30	160	55**	122	1.4	163.8	48	8.2×10^{-10}
	2007.1 -2007.9	A	Vertical	2.84	10.39	10.08	2.6	158.9	0.10	30	160	97	57	2.9 †	158.9	72	9.4×10^{-9}
		A	Horizontal		7.58	5.04	2.7	158.4	0.11	30	160	90**	132	2.9	158.4	70	1.2×10^{-9}
8	2021.8 - 2022.5	A	Vertical	2.85	9.34	10.12	1.6	164.7	0.07	30	160	96	16	1.6 †	164.7	58	4.3×10^{-5} ††
		A	Horizontal		4.63	5.04	1.0	165.3	0.07	30	160	74**	152	1.6	165.3	61	5.9×10^{-10}
	2022.9 - 2023.4	A	Vertical	2.85	7.22	10.12	1.4	167.8	0.06	30	160	91**	35	1.5 †	167.8	71	3.3×10^{-6} ††
		A	Horizontal		3.00	5.03	1.3	169.4	0.05	30	160	70**	141	1.5	169.4	86	8.5×10^{-10}

Where: w_c = Moisture content; γ_d = Dry density; G_s = Specific gravity; n = Total Porosity; $\overline{\sigma}_c$ = Average isotropic effective confining stress; u_b = Back-pressure; and S = Calculated degree of saturation using measured specific gravity.

* Method A=Constant-head test; Method C = Falling-head test with increasing tailwater level.

** B-Factor remained relatively constant for two consecutive increments of applied cell pressure.

† Vertical permeability test specimen was cored upon completion of testing to obtain horizontal permeability test specimen. The final moisture content of the vertical test specimen was not measured, and was assumed to be the same as the horizontal permeability test specimen.

†† Specimen displayed secondary porosity from visible cracks.

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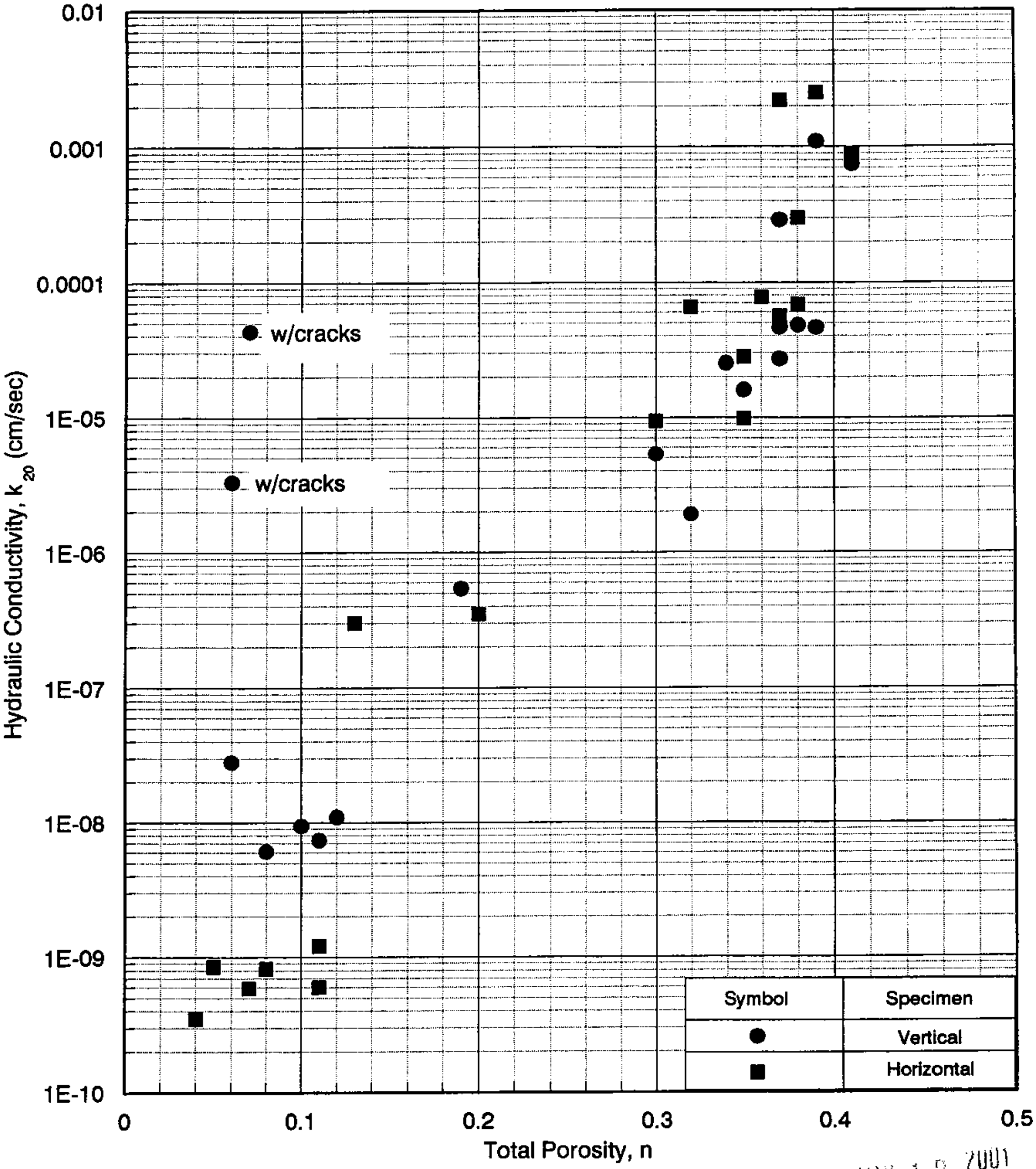
Table 2

UNCONFINED COMPRESSION TEST RESULTS
CITY OF POMPANO BEACH CONCENTRATE DISPOSAL INJECTION WELL IW-1

Core No.	Core Depth Interval (feet)	Specimen Dimensions			w_c (%)	γ_d (lb/ft^3)	Loading Rate (cm/min)	t_f (min)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)		Young's Modulus E(lb/in^2)**
		Length L (cm)	Diameter D (cm)	L/D					Measured	Corrected*	
5	1962.5 - 1963.4	10.24	5.03	2.04	9.1	115.4	0.013	5.2	2,480	2,490	$5.0x10^5$
5	1965.2 - 1966.0	10.28	5.03	2.04	1.8	123.6	0.013	5.3	2,660	2,670	$5.0x10^5$
6	1983.3 - 1984.1	9.93	5.03	1.97	1.7	150.0	0.013	5.7	3,390	3,380	$6.1x10^5$
7	2000.0 - 2001.1	10.06	5.05	1.99	1.3	159.0	0.013	14.7	13,880	13,870	$8.0x10^5$
7	2007.1 - 200.7.9	10.24	5.05	2.03	0.7	169.8	0.013	14.9	14,510	14,540	$8.0x10^5$

Where: w_c = Moisture content; γ_d = Dry density; and t_f = Time to failure.

* Unconfined compressive strength corrected to L/D ratio of 2 in accordance with ASTM Standard D 2938-86.
** Young's modulus calculated from slope of the straight-line portion of the stress-strain curve.



HYDRAULIC CONDUCTIVITY VS. TOTAL POROSITY

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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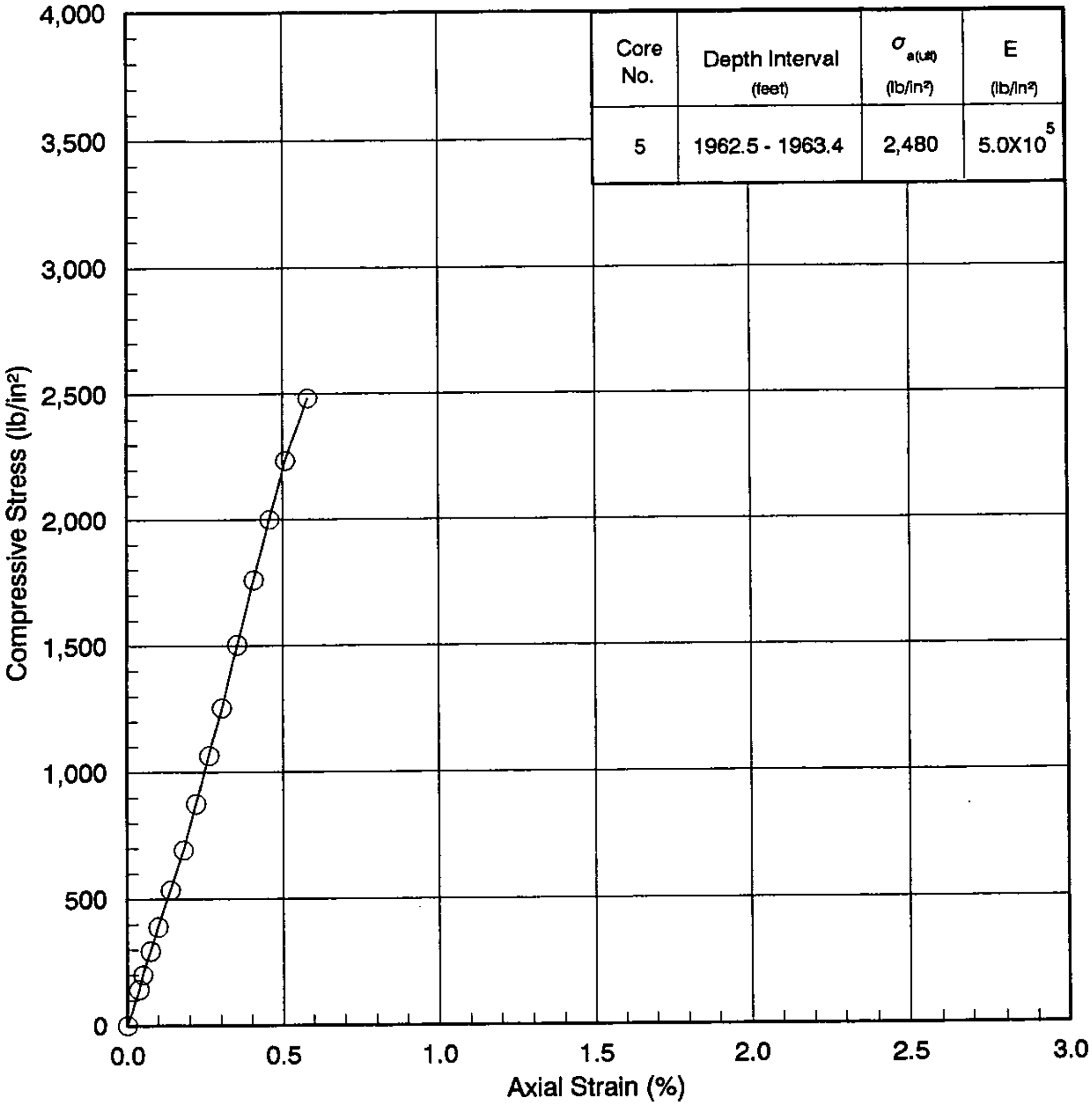
DATE: 11-14-01
FILE NO.: 01-131
APPROVED BY: TM
FIGURE: 1

mvskvkh.drw



Core No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
5	1962.5 - 1963.4	2,480	$5.0X10^5$

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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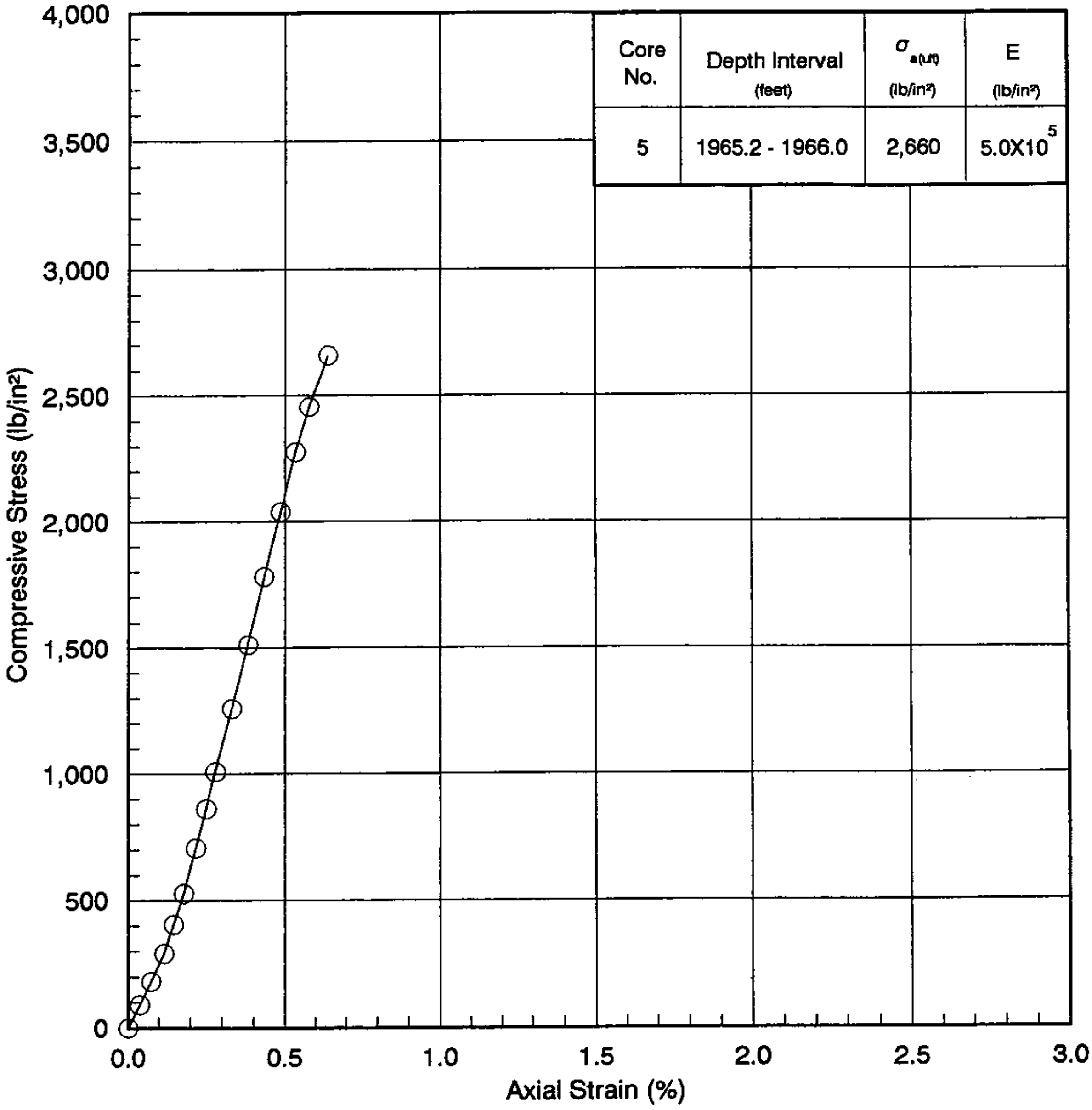
FILE NO.: 01-131	APPROVED BY:	FIGURE: 2



Core No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
5	1965.2 - 1966.0	2,660	$5.0X10^5$

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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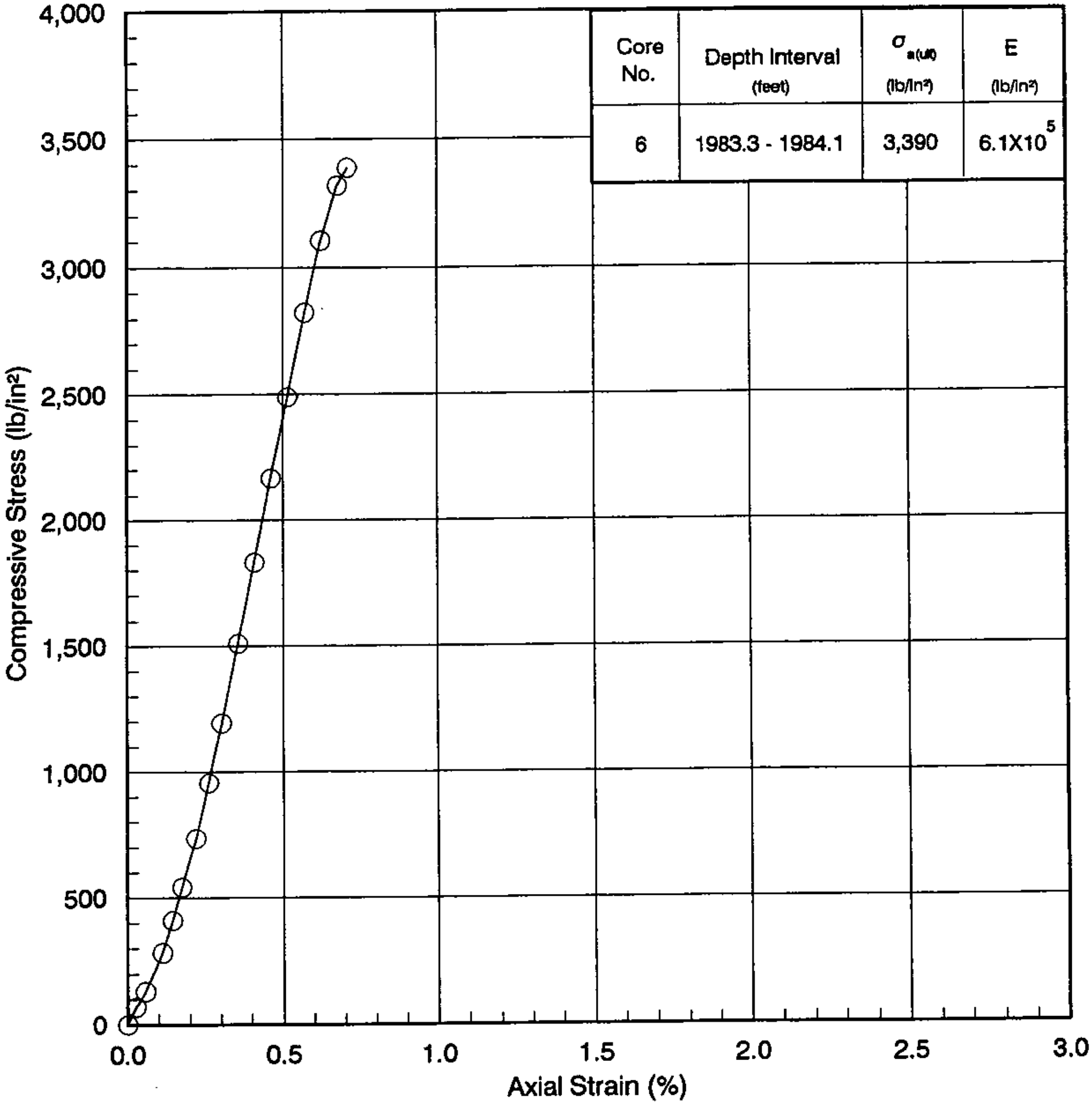
FILE NO.: 01-131	APPROVED BY:	FIGURE: 3



Core No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
6	1983.3 - 1984.1	3,390	$6.1X10^5$

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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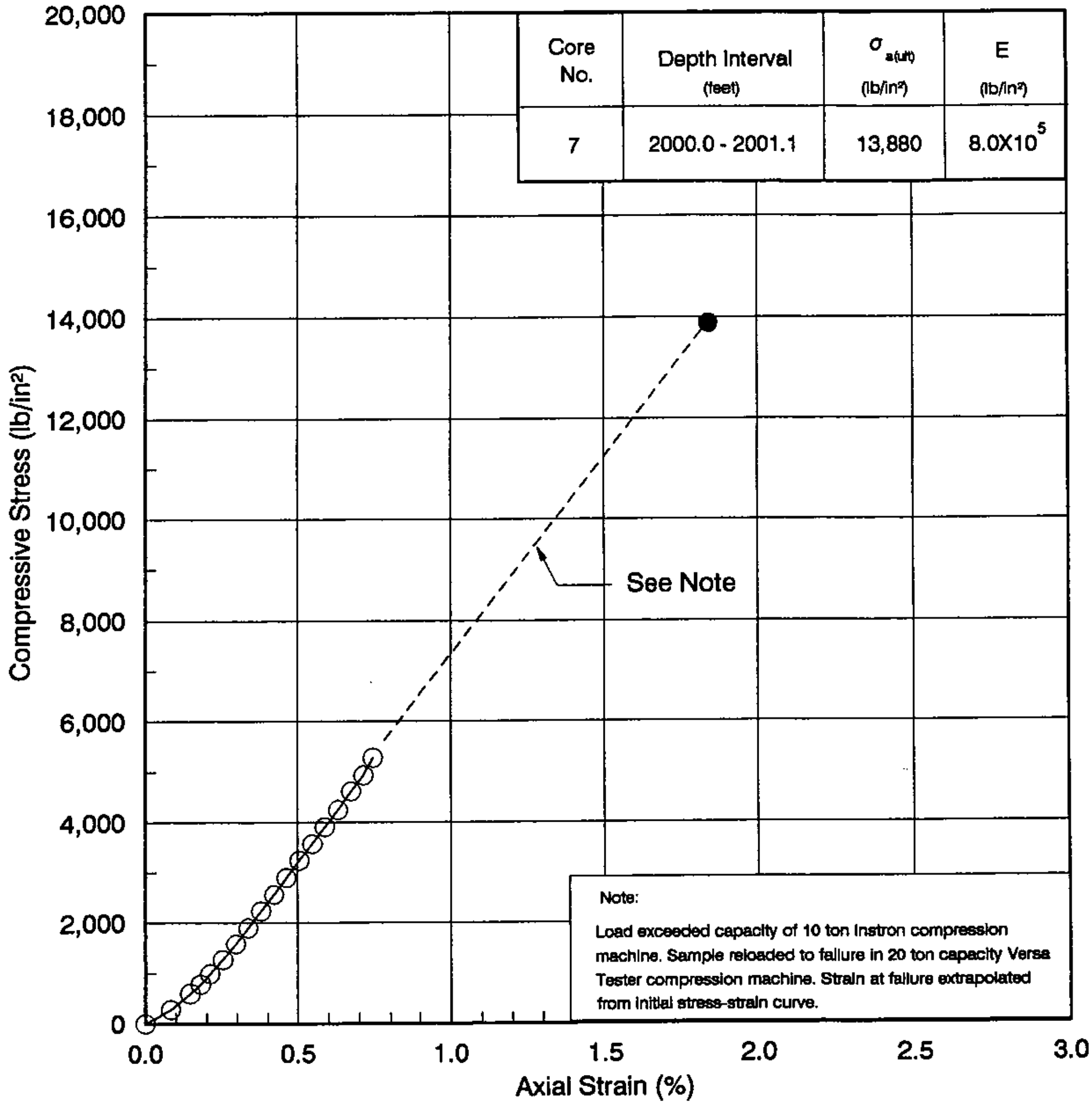
FILE NO.: 01-131	APPROVED BY: TM	FIGURE: 4



Core No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
7	2000.0 - 2001.1	13,880	$8.0X10^5$

Note:

Load exceeded capacity of 10 ton Instron compression machine. Sample reloaded to failure in 20 ton capacity Versa Tester compression machine. Strain at failure extrapolated from initial stress-strain curve.

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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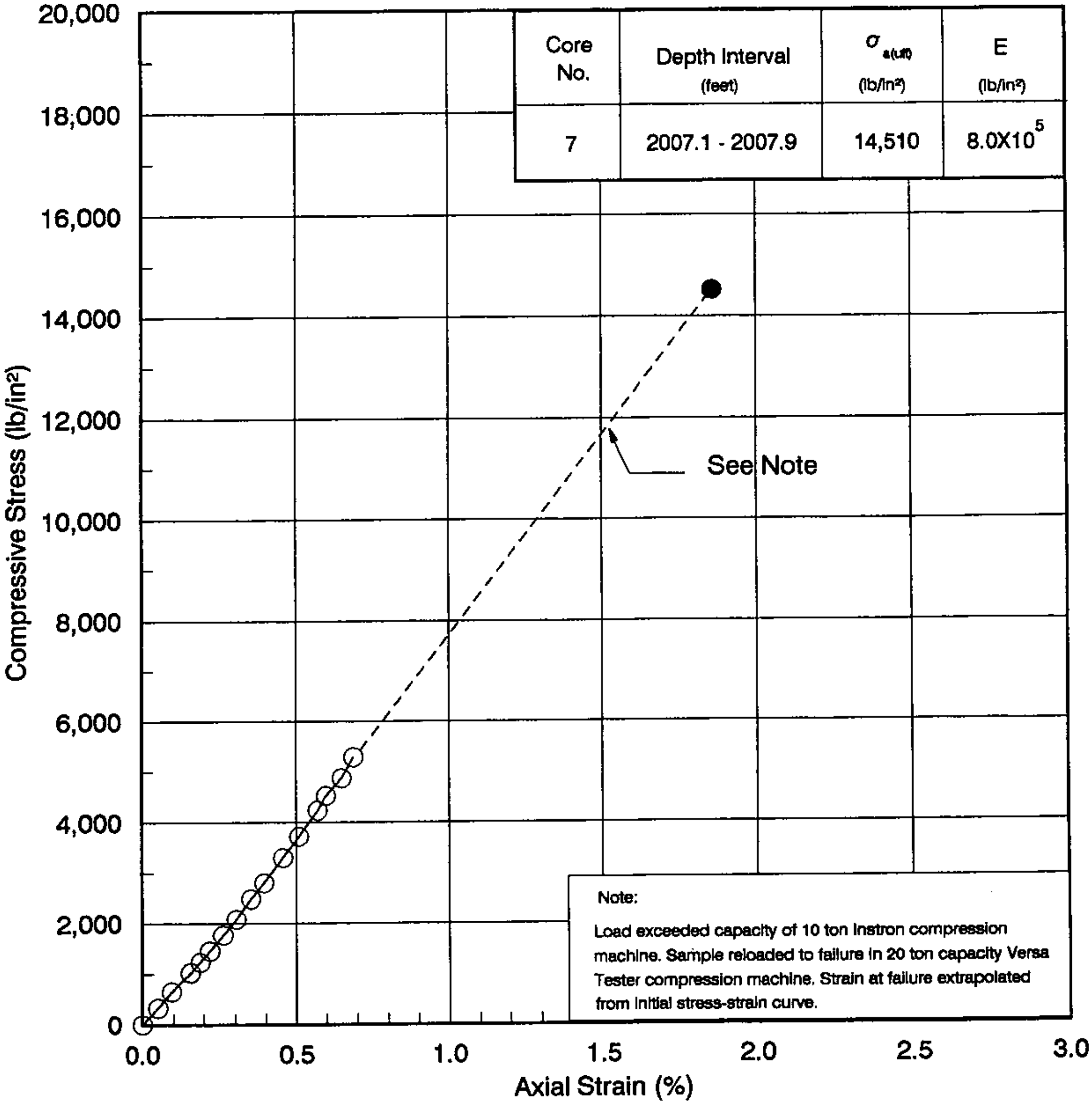
FILE NO.: 01-131	APPROVED BY: TM	FIGURE: 5



Core No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
7	2007.1 - 2007.9	14,510	$8.0X10^5$

Note:

Load exceeded capacity of 10 ton Instron compression machine. Sample reloaded to failure in 20 ton capacity Versa Tester compression machine. Strain at failure extrapolated from initial stress-strain curve.

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF POMPANO BEACH
CONCENTRATE DISPOSAL WELL IW-1

YOUNGQUIST BROTHERS, INC.

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APPENDIX F

GEOPHYSICAL LOGS

Geophysical Log Index

Appendix F
Geophysical Logs
Log Index

Well	Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
IW-1	X–Y Caliper / Gamma Ray	June–5–01	121 – 1030	50
IW-1	Cement Temperature Log	June–6–01	Surface – 1,020	42
IW-1	X–Y Caliper / Gamma Ray	June–21–01	1,020 – 2,026	12.25
IW-1	Dual Induction LL3/SP	June–21–01	1,020 – 2,026	12.25
IW-1	Borehole Televiewer	June–21–01	1,020 – 2,026	12.25
IW-1	Borehole Compensated Sonic / VDL	June–22–01	1,020 – 2,026	12.25
IW-1	Flowmeter	June–22–01	1,020 – 2,026	12.25
IW-1	Fluid Conductivity /Temperature	June–22–01	1,020 – 2,026	12.25
IW-1	X–Y Caliper / Gamma Ray	August–05–01	1,020– 1,955	42
IW-1	Temperature (Cement Top)	August–07–01	1,020 – 1,955	34
IW-1	X–Y Caliper / Gamma Ray	August–21–01	1,950 – 2,977	12.25
IW-1	Dual Induction LL3/SP	August–21–01	1,950 – 2,977	12.25
IW-1	Borehole Televiewer	August–21–01	1,950 – 2,977	12.25
IW-1	Borehole Compensated Sonic / VDL	August–21–01	1,950 – 2,977	12.25
IW-1	Fluid Conductivity /Temperature	August–21–01	1,950 – 2,977	12.25
IW-1	Flowmeter	August–30–01	1,950 – 2,977	12.25
IW-1	X–Y Caliper / Gamma Ray	November–26–01	1,950 – 2,900	32.5
IW-1	Temperature (Cement Top)	December–20–02	0 – 2,293	24
IW-1	Cement Bond Log	December–28–02	0 – 2,293	24
IW-1				
IW-1	Temperature (Cement Top)	January–06–02	0 – 2,273	16
IW-1	Cement Bond Log	January–7–02	0 – 2,273	16
IW-1	Temperature	March-22-02	0 – 2,091	16
IW-1	Radioactive Tracer Survey	March-22-02	0 – 2,091	16
MW–1	X–Y Caliper / Gamma Ray	January–22–02	28 – 160	32.5
MW–1	Temperature (Cement Top)	January–23–02	0 – 160	24
MW–1	X–Y Caliper / Gamma Ray	January–30–02	160 – 1,520	22.5
MW–1	Dual Induction LL3/SP	January–30–02	160 – 1,520	22.5
MW–1	Borehole Compensated Sonic / VDL	January–30–02	160 – 1,520	22.5
MW–1	Temperature (Cement Top)	February–01–02	0 – 1,520	16
MW–1	X–Y Caliper / Gamma Ray	February–07–02	1,520 – 1,950	14.75
MW–1	Dual Induction LL3/SP	February–07–02	1,520 – 1,950	14.75
MW–1	Borehole Compensated Sonic / VDL	February–07–02	1,520 – 1,950	14.75

Well	Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
MW–1	Fluid Conductivity /Temperature	February–07–02	1,520 – 1,950	14.75
MW–1	Cement Bond Log	February–07–02	0 – 1,520	16
MW–1	Temperature (Cement Top)	February–16–02	0 – 1,900	6.625
MW–1	Cement Bond Log	February–18–02	0 – 1,915	6.625

Flow Meter Analysis

FLOWMETER ANALYSIS

POMPANO BEACH
CONCENTRATE DISPOSAL WELL
IW#1

On June 22, 2001 a downhole packer was set at 1058' to evaluate the open hole. A surface pump was used to pump water from the open hole at a dynamic flow rate of approximately 360 GPM. The following plots were generated from logging data collected by the flowmeter tool.

Figure 1 is a quick look interpretation consisting of 3 separate graphs: caliper (to compare borehole size to flowrate), line speed (for quality control), and flowrate (comparing the static down pass to the dynamic down pass). No positive separation between the static and dynamic flowrate curves is shown below the fracture at 1870', so no obvious flow is induced by the pump below this depth. Above 1870' however, we see a sudden change in the dynamic flowrate. This flow remains relatively constant(except for borehole size effects) extending upward and into the drillpipe supporting the packer at 1858'.

Figure 2 is the percent flow analysis of the dynamic pass. It indicates no flow from the bottom of the hole up to 1900' A small amount (roughly 20%) of flow appears to develop gradually above 1900' and up to the fractured interval near 1870'. All of the remaining flow (80%) occurs near 1870' and remains constant up to the packer.

Figure 3 is the total flow analysis of the dynamic pass. It mirrors the percent flow graph except that it is expressed in gpm.

In summary, the fractured interval near 1870' provides 80-100% of the flow being developed and pumped out of the open hole.

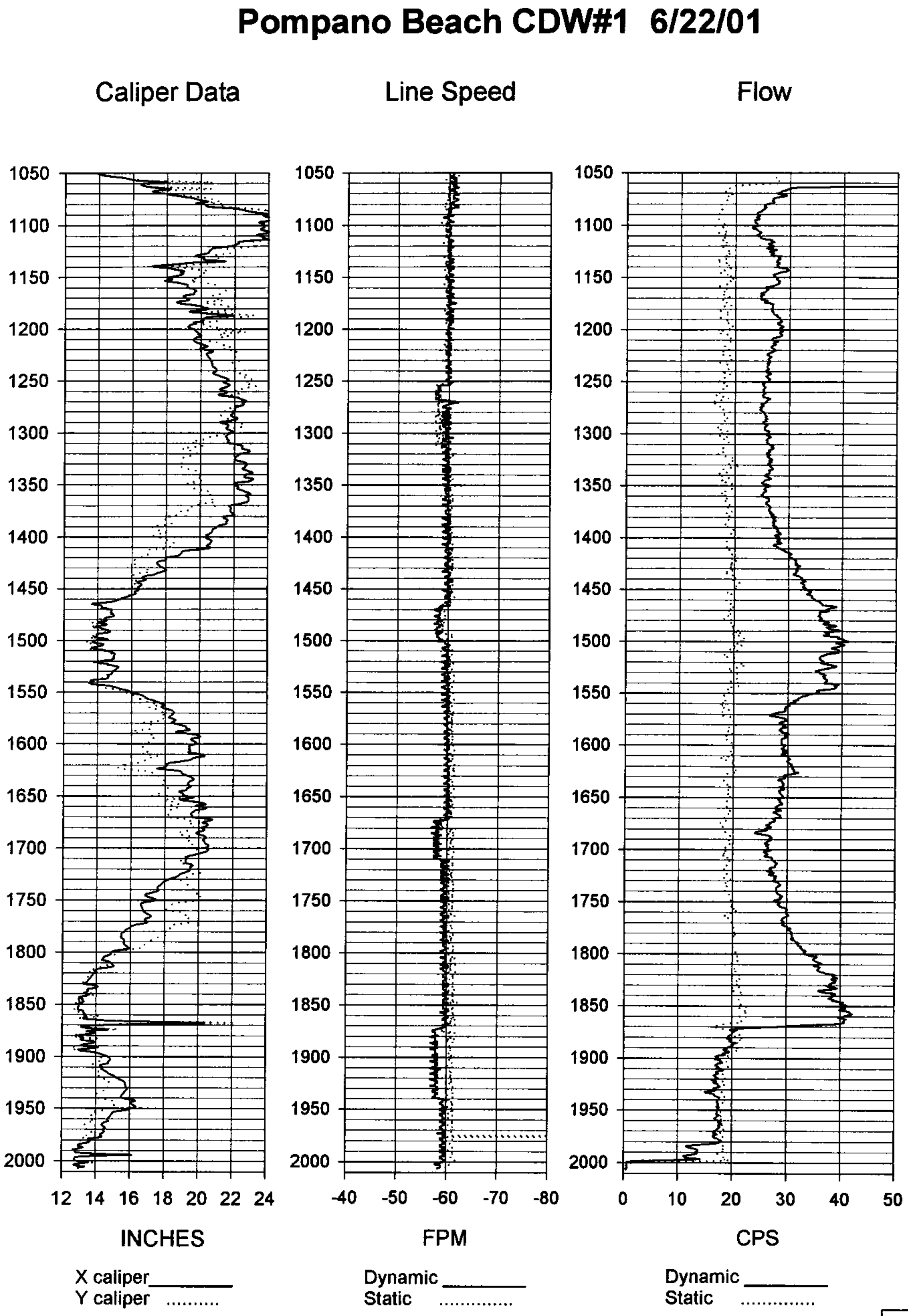

Pompano Beach CDW#1 6/22/01
Caliper Data
Line Speed
Flow
1050
1100
1150
1200
1250
1300
1350
1400
1450
1500
1550
1600
1650
1700
1750
1800
1850
1900
1950
2000
12 14 16 18 20 22 24
INCHES
X caliper________
Y caliper ....
-40 -50 -60 -70 -80
FPM
Dynamic ________
Static ....
0 10 20 30 40 50
CPS
Dynamic ________
Static ....

FIG 1

Pompano Beach CDW#1 6/22/01

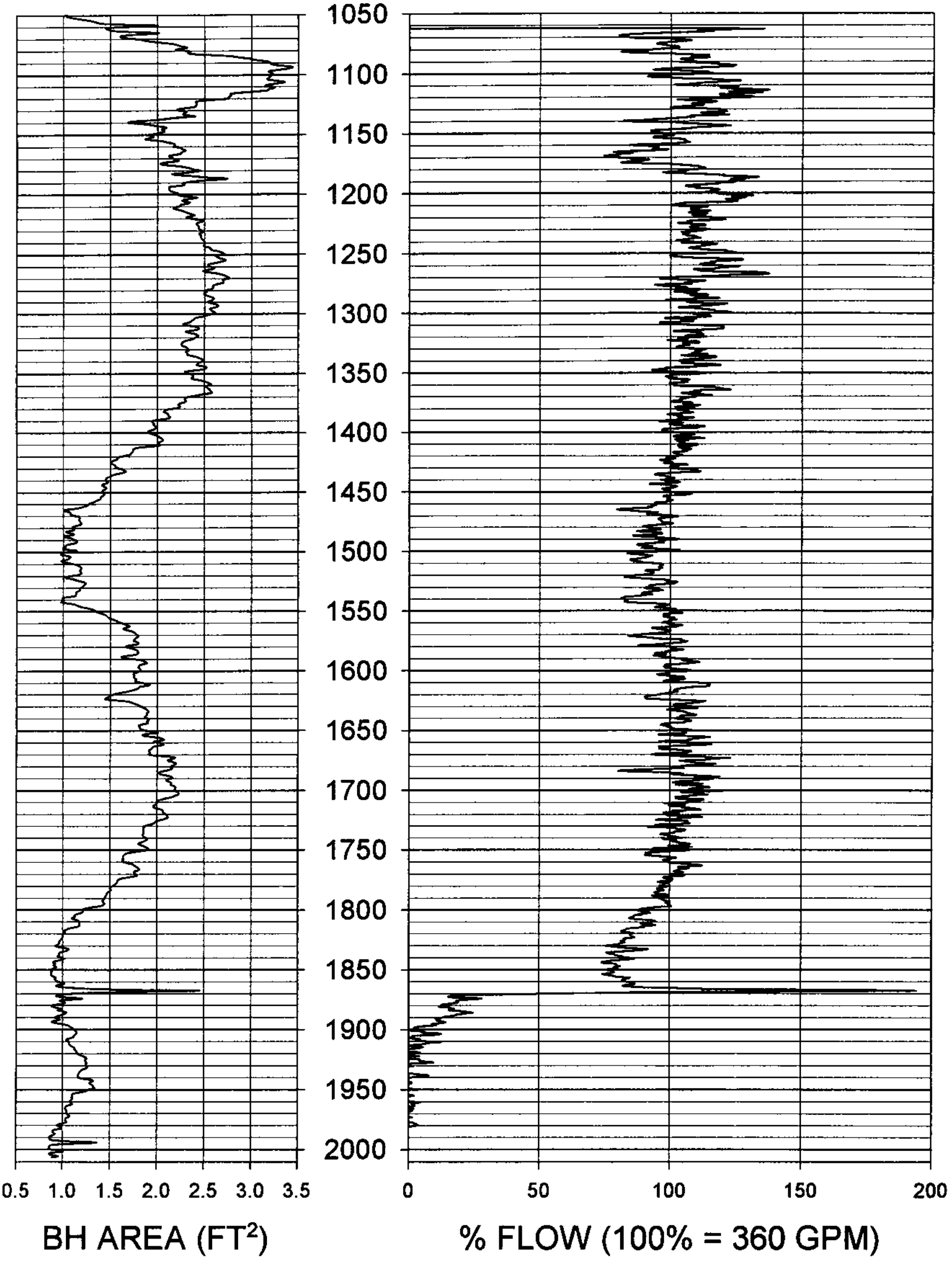


FIG 2

Pompano Beach CDW#1 6/22/01

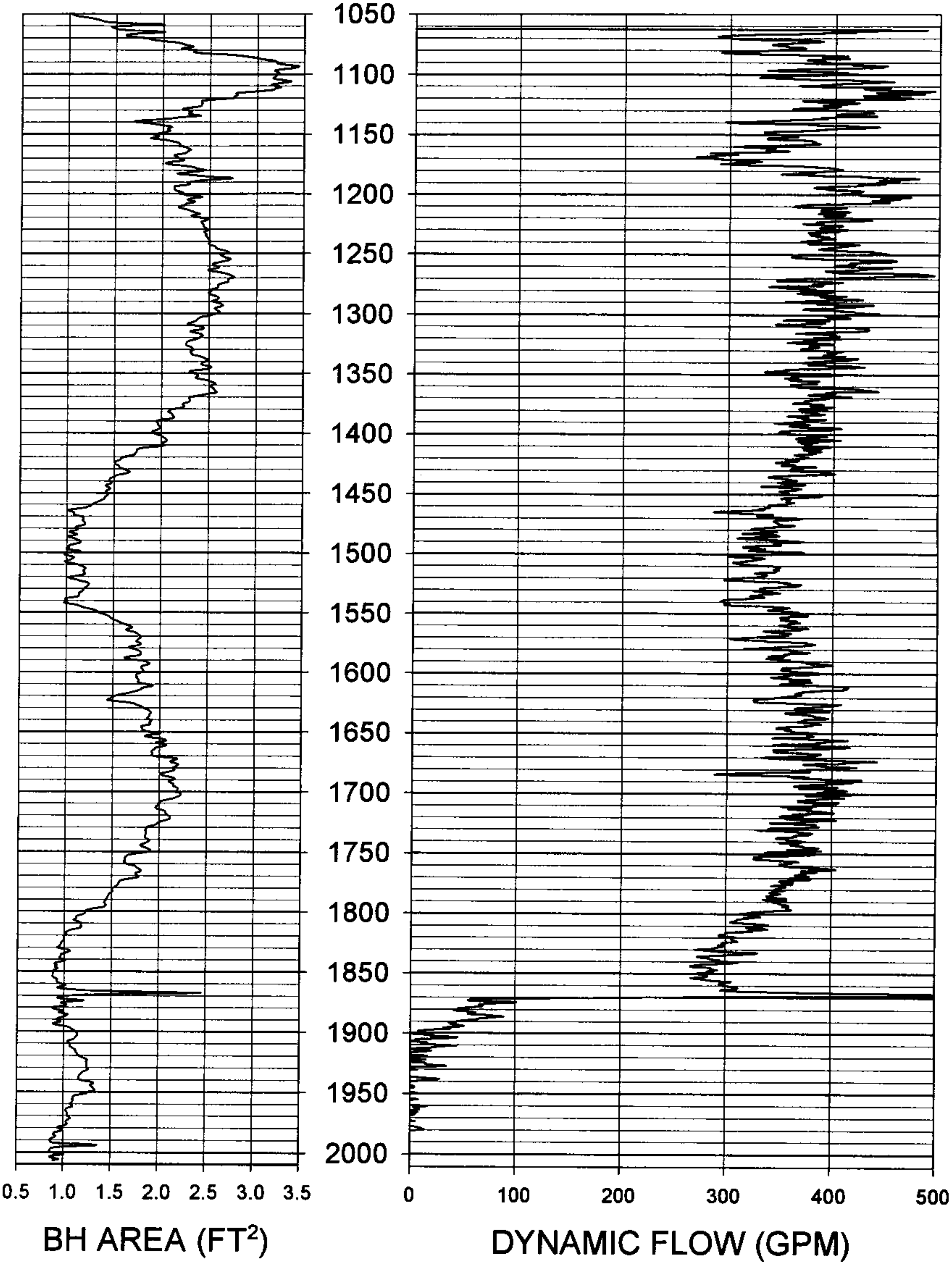
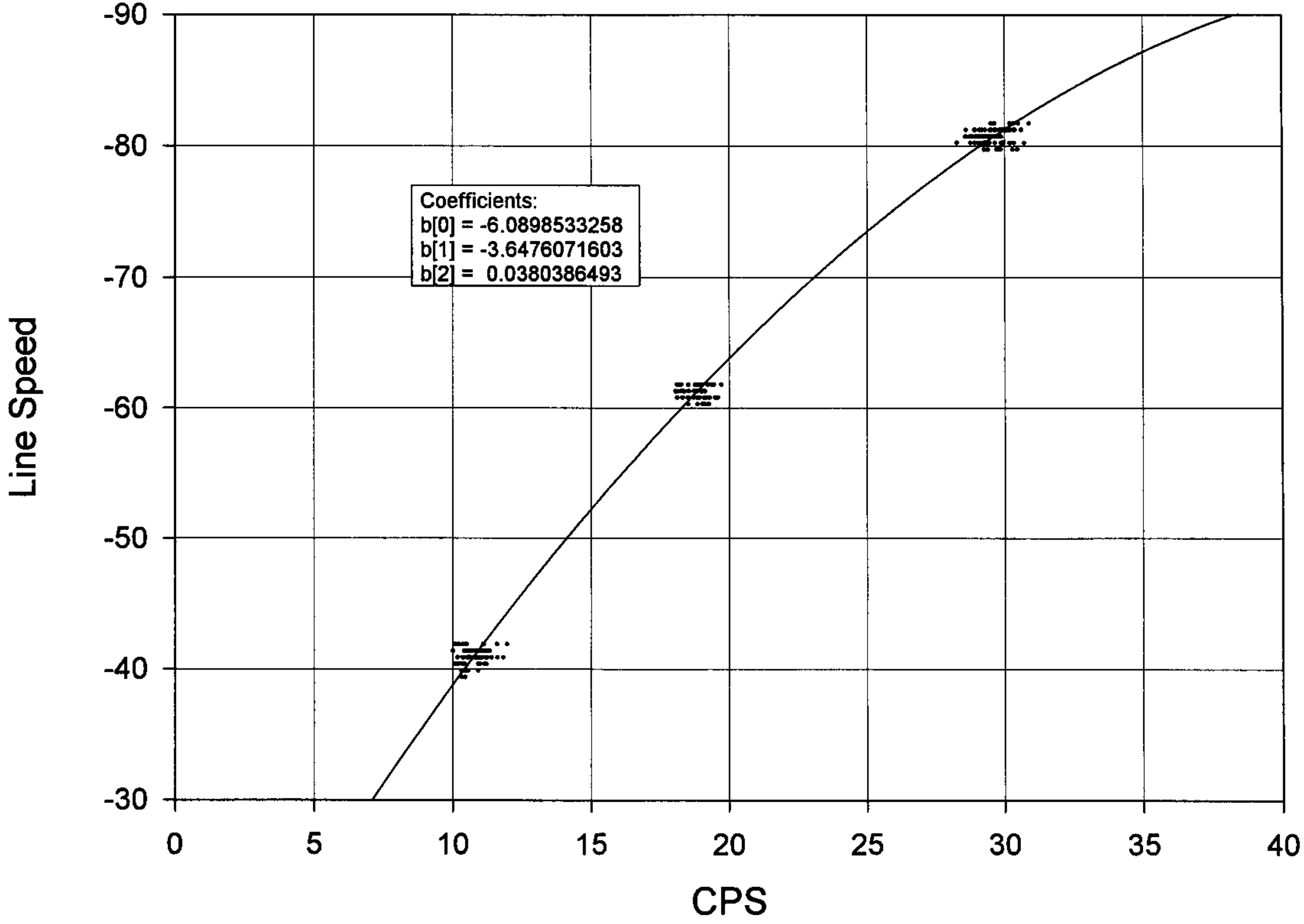


FIG 3

Pompano Beach CDW#1 6/22/01



FLOWMETER ANALYSIS

POMPANO BEACH CONCENTRATE DISPOSAL WELL #1

On August 25, 2001 drillpipe was set at 2612' in order to evaluate the bottom of the open hole interval while staying below the formation trouble experienced just above 2612'. A surface pump was used to pump water from the open hole at a dynamic flow rate of approximately 240 GPM. The following plots were generated from logging data collected by the flowmeter tool.

Figure 1 is a percent flow analysis of the dynamic pass. It indicates very little flow(< 25%) below 2750'. Some flow is developed in the fractured interval from 2700'-2750' Although the overall flow is low, 75-100% is developed above 2750' and remains constant into drillpipe.

Figure 2 is the total flow analysis of the dynamic pass. It mirrors the percent flow graph except that it is expressed in gpm.

Figure 3 is a quick look interpretation consisting of 3 separate graphs: caliper (to compare borehole size to flowrate), line speed (for quality control), and flowrate (comparing the static up pass to the dynamic up pass). The small positive separation between the static and dynamic flowrate curves from 2840'-2910' is attributed to a difference in line speed. Actual positive separation occurs only above the large fractured interval at 2700' This flow remains relatively constant(except for borehole size effects) extending upward and into the drillpipe
.

In summary, the fractured interval at 2700' provides 80-100% of the flow being developed and pumped out of the open hole.

Pompano Beach CDW#1

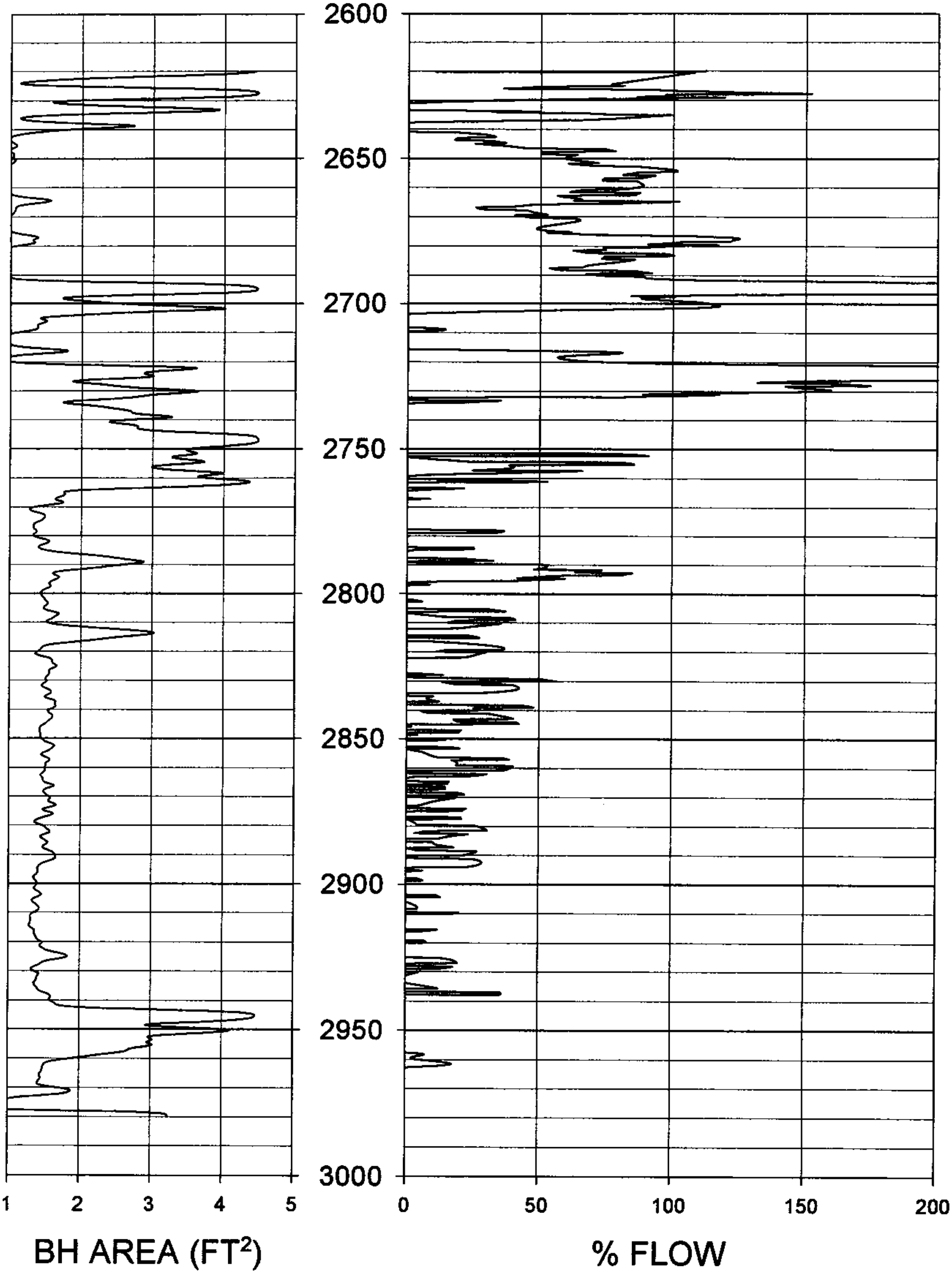


FIG 1

Pompano Beach CDW#1

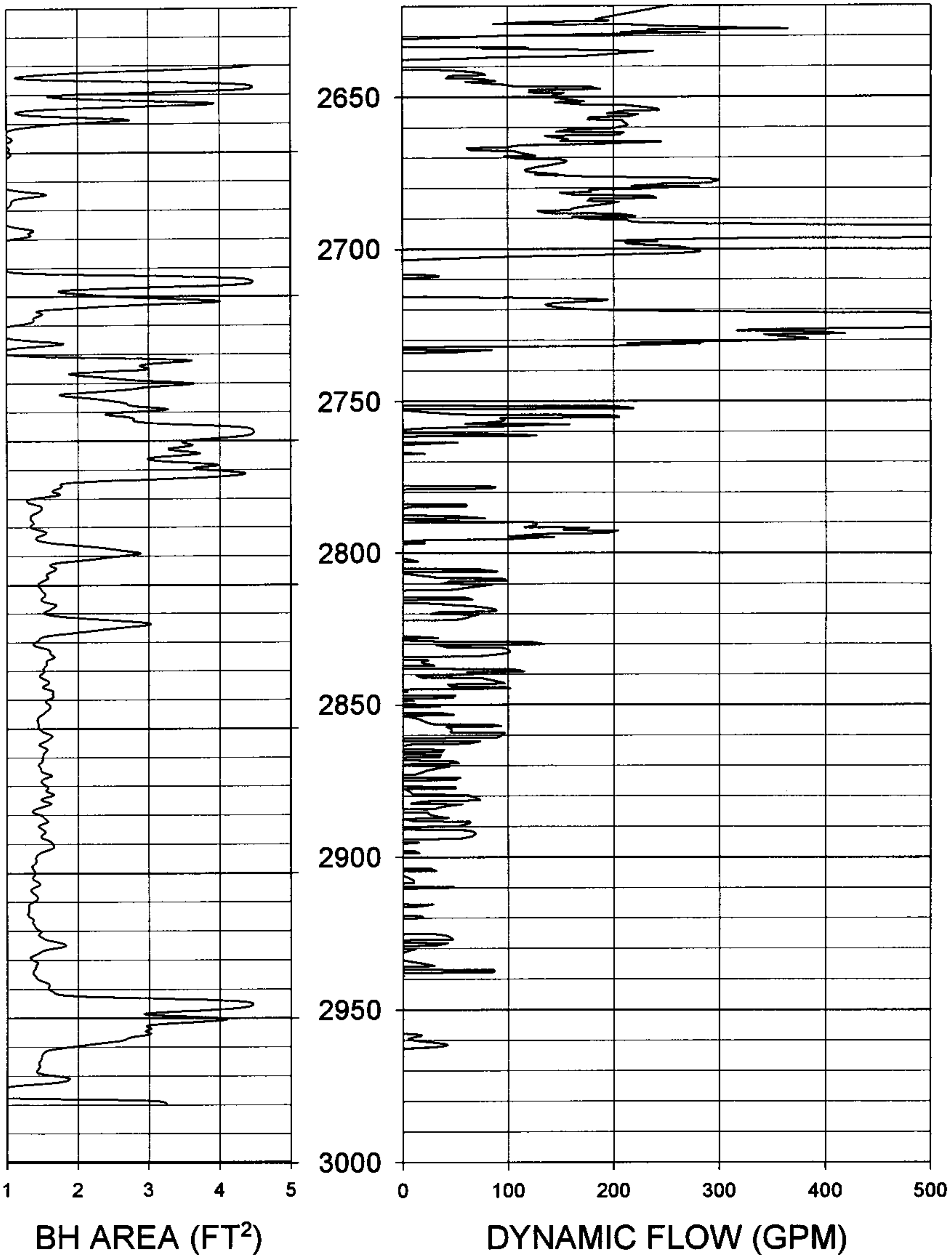
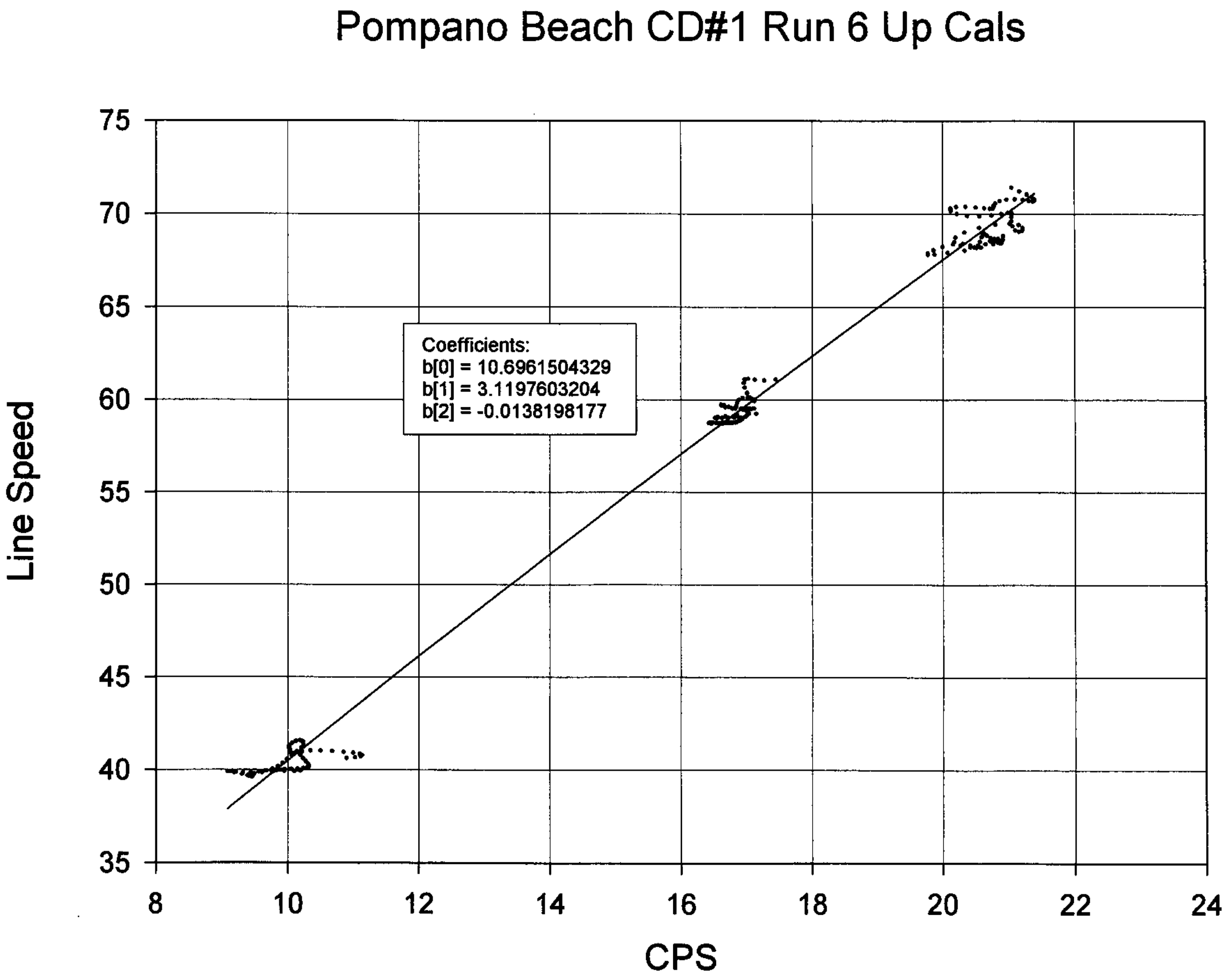


FIG 2


Pompano Beach CD#1 Run 6 Up Cals
Coefficients:
b[0] = 10.6961504329
b[1] = 3.1197603204
b[2] = -0.0138198177
Line Speed
CPS
75
70
65
60
55
50
45
40
35
8
10
12
14
16
18
20
22
24

FLOWMETER ANALYSIS

POMPANO BEACH
CONCENTRATE DISPOSAL WELL #1

On August 30, 2001 flow logs were run on the open hole interval below casing at 1950' down to 2275. A surface pump was used to pump water from the open hole at a dynamic flow rate of approximately 240 GPM. The following plots were generated from logging data collected by the flowmeter tool.

Figure 1 is a percent flow analysis of the dynamic pass. It indicates virtually no flow below 2150'. Flow gradually increases uphole above the prominent fracture at 2150' to account for approximately 30-40% of total flow before reaching the fractured interval at 2030' An additional 40-50% of total flow is developed from this interval. 100% of total flow is achieved just below 2010'

Figure 2 is the total flow analysis of the dynamic pass. It mirrors the percent flow graph except that it is expressed in gpm.

Figure 3 is a quick look interpretation consisting of 3 separate graphs: caliper (to compare borehole size to flowrate), line speed (for quality control), and flowrate (comparing the static down pass to the dynamic down pass). A small amount of flow above 2140' is evident from the positive separation between the static and dynamic flowrate curves. This separation increases sharply at 2030' and again just below 2010', indicating additional flow being developed at these two depths.

Pompano Beach CD#1

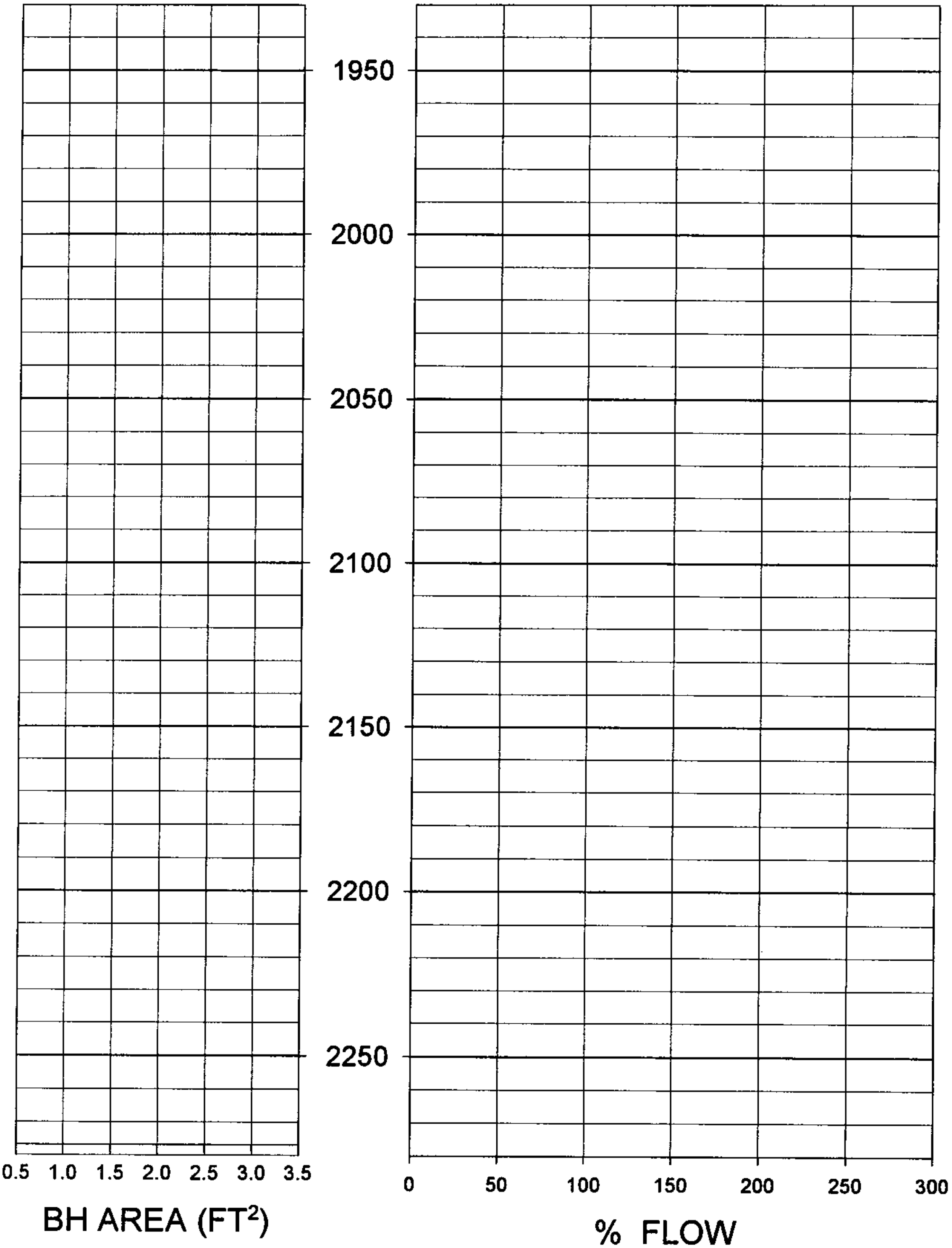


FIG 1

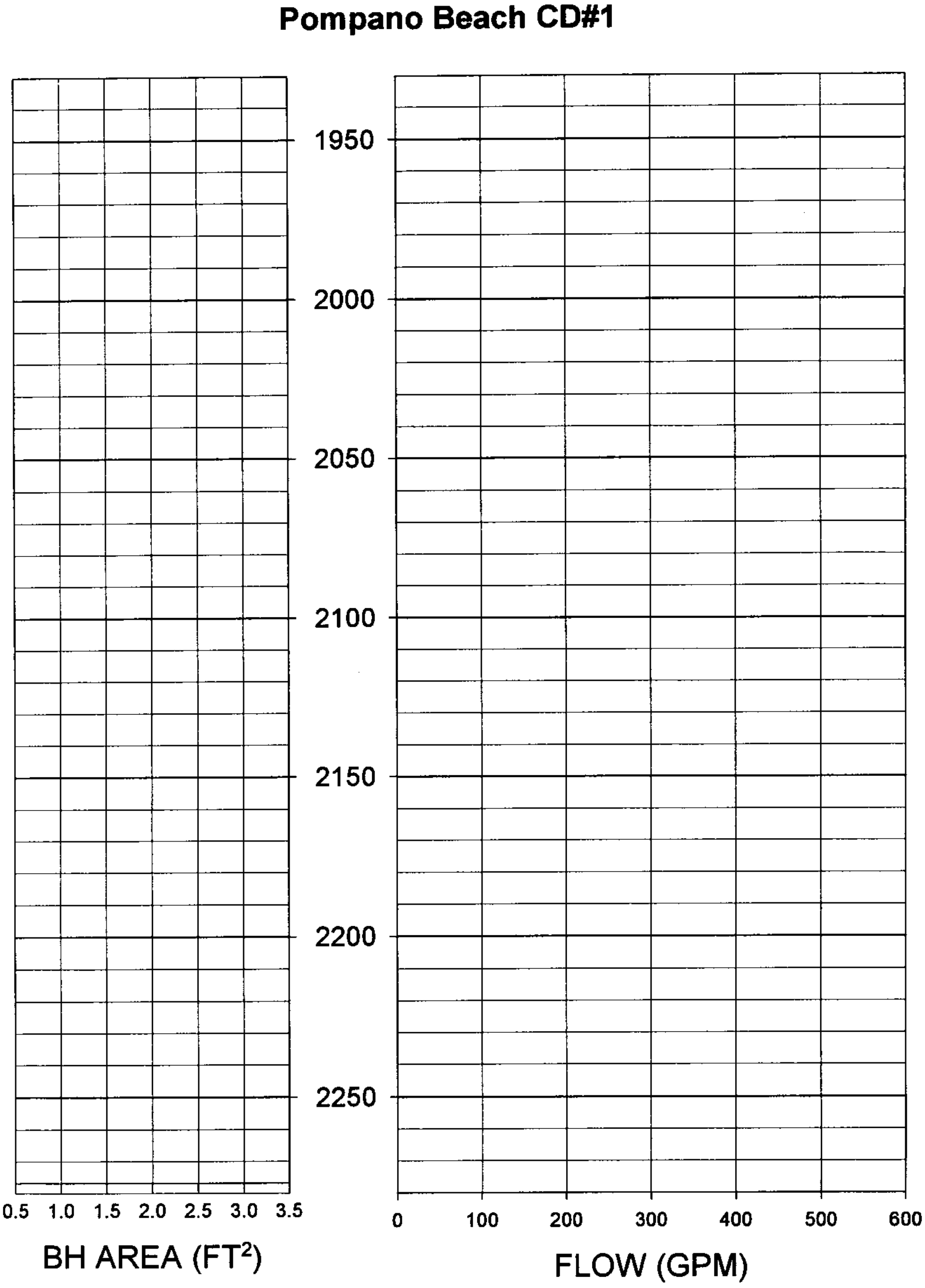

Pompano Beach CD#1
1950
2000
2050
2100
2150
2200
2250
0.5 1.0 1.5 2.0 2.5 3.0 3.5
BH AREA (FT²)
0 100 200 300 400 500 600
FLOW (GPM)

FIG 2

Pompano Beach CD#1

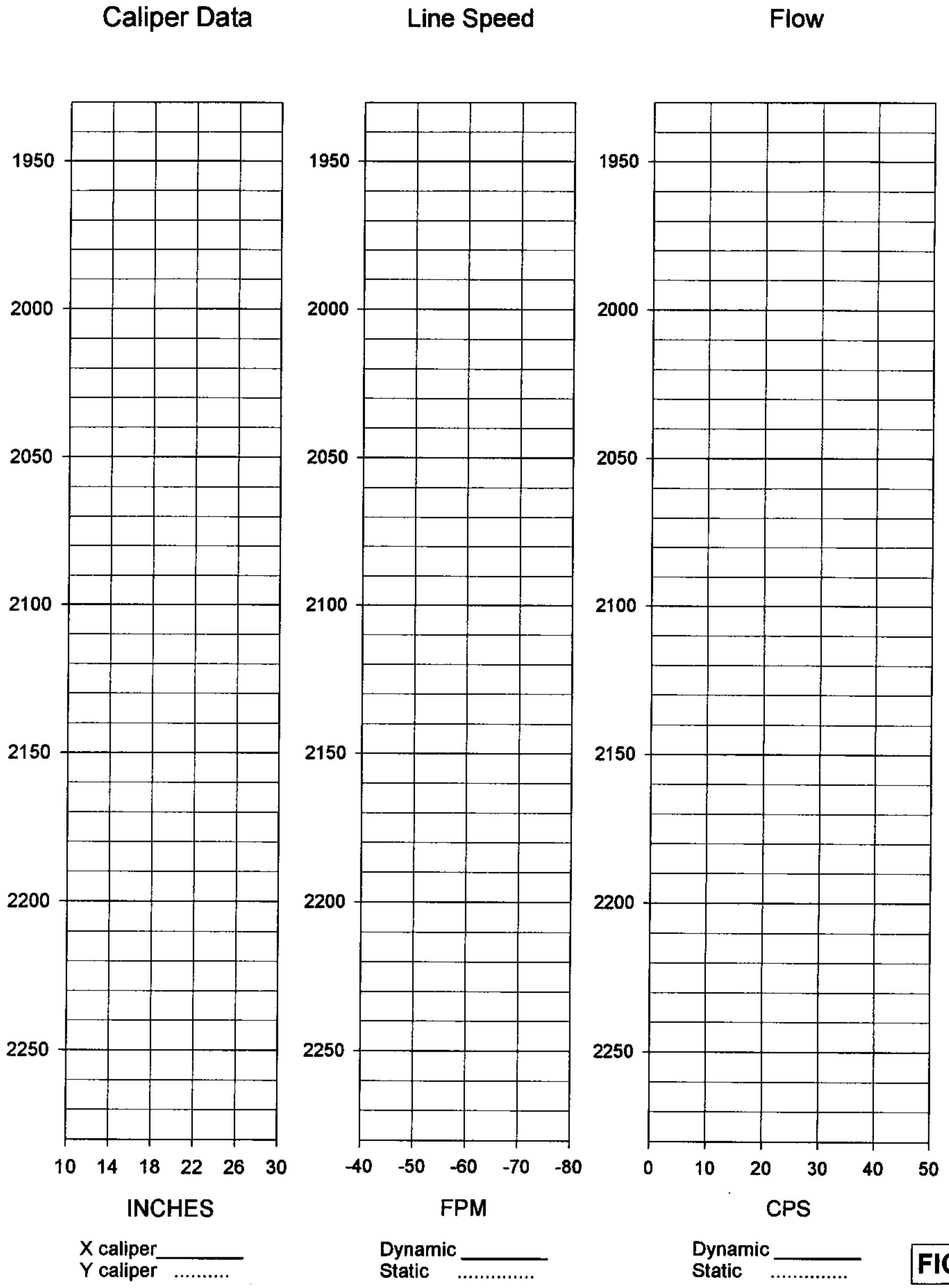
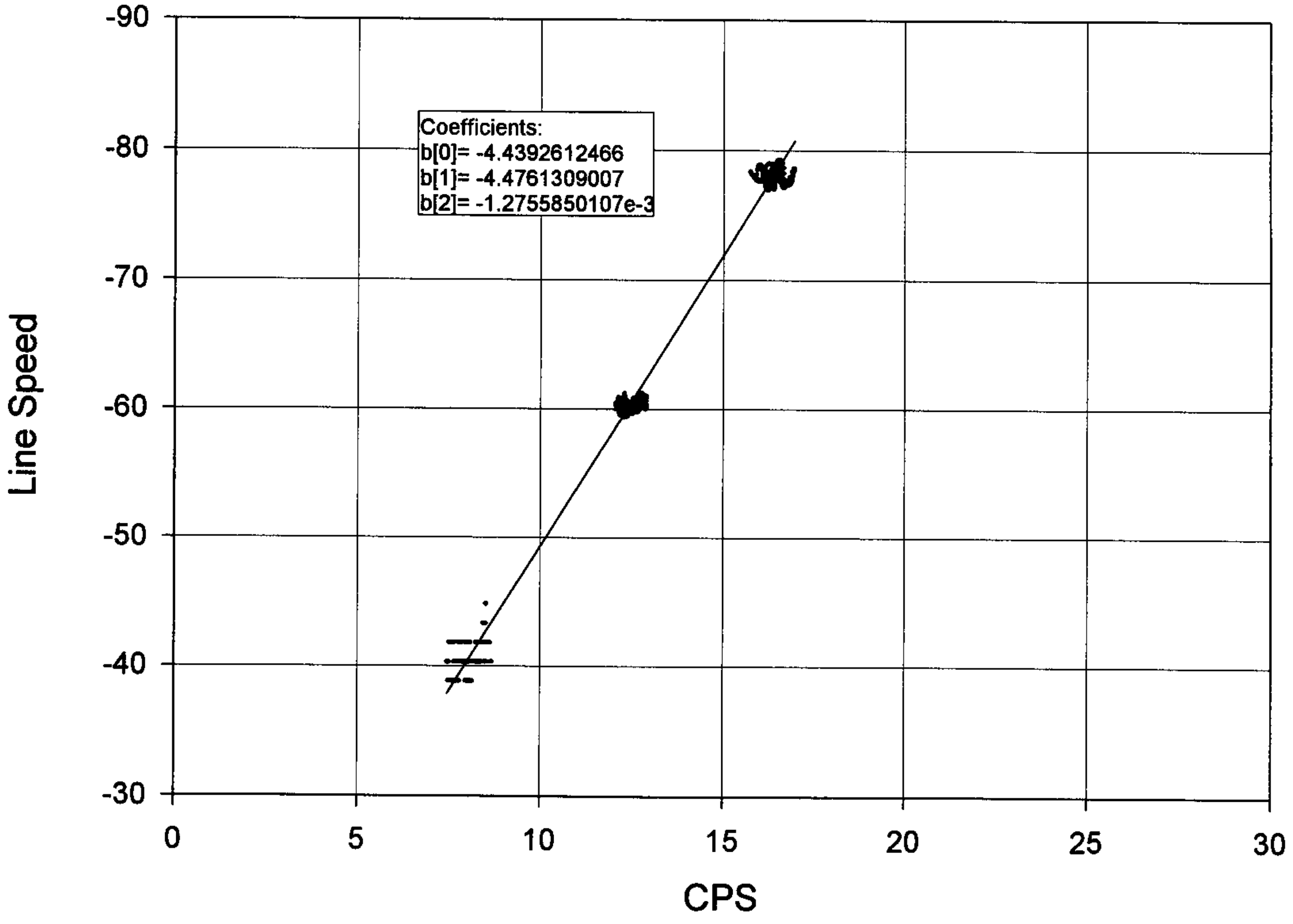


FIG 3

Pompano Beach CD#1 Run 7 Down Cals



FLOWMETER ANALYSIS

POMPANO BEACH
CONCENTRATE DISPOSAL WELL #1

On August 30, 2001 drillpipe was hung below 2300' in order to run flow logs over the middle portion of the open hole interval. A surface pump was used to pump water from the open hole at a dynamic flow rate of approximately 240 GPM. The following plots were generated from logging data collected by the flowmeter tool.

Figure 1 is a percent flow analysis of the dynamic pass. It indicates virtually no flow below 2450'. Flow quickly increases uphole above roughly 2440', accounting for 75% of total flow above 2425'. The remaining 25% of total flow is developed from the fractures below 2390'.

Figure 2 is the total flow analysis of the dynamic pass. It mirrors the percent flow graph except that it is expressed in gpm.

Figure 3 is a quick look interpretation consisting of 3 separate graphs: caliper (to compare borehole size to flowrate), line speed (for quality control), and flowrate (comparing the static down pass to the dynamic down pass). Flow appears to steadily increase uphole from just above 2440' and continues to grow.

In summary, all of the flow in this portion of the open hole is being developed from the 2395'-2450' fractured interval.

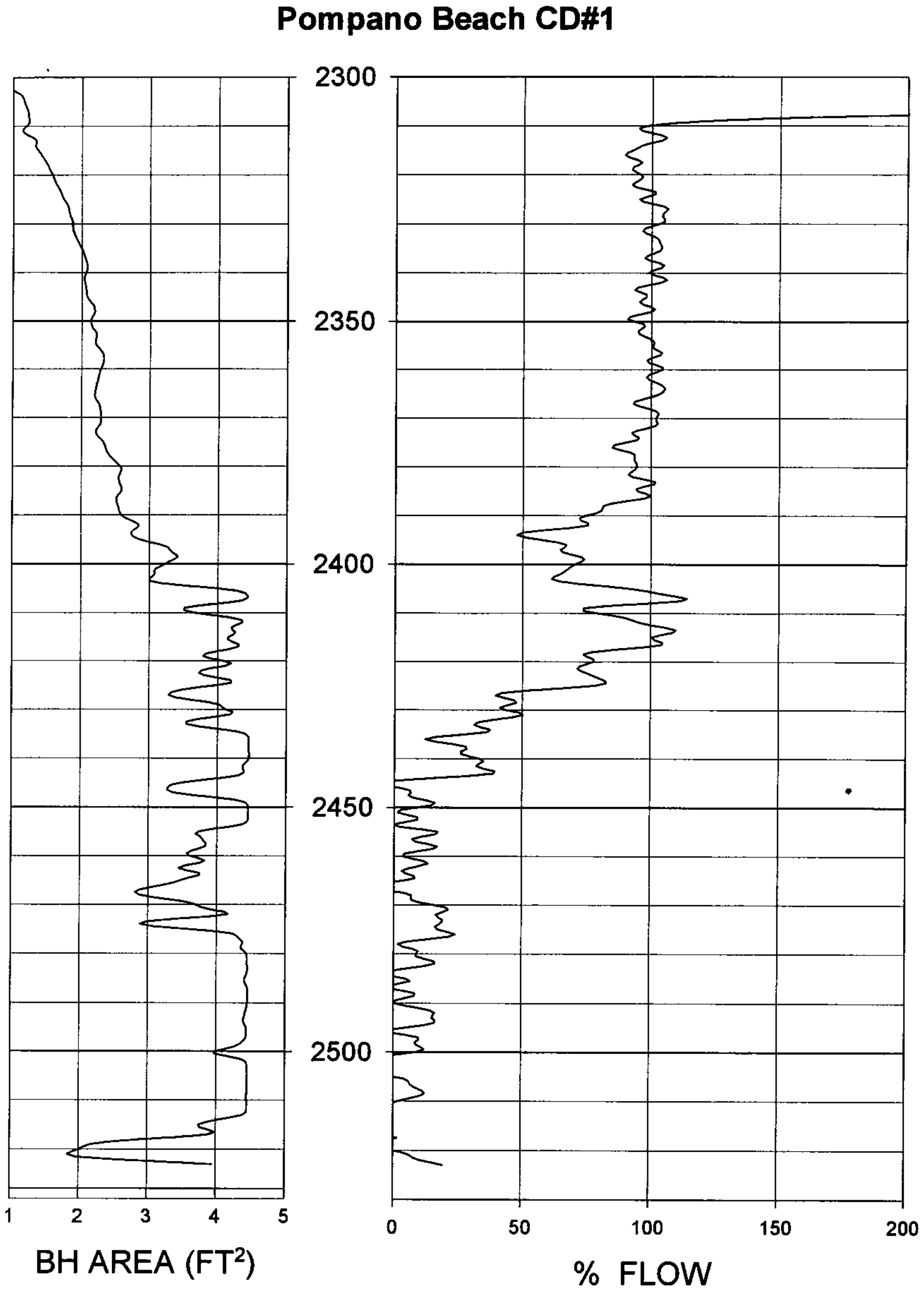

Pompano Beach CD#1
2300
2350
2400
2450
2500
1
2
3
4
5
BH AREA (FT²)
0
50
100
150
200
% FLOW

FIG 1

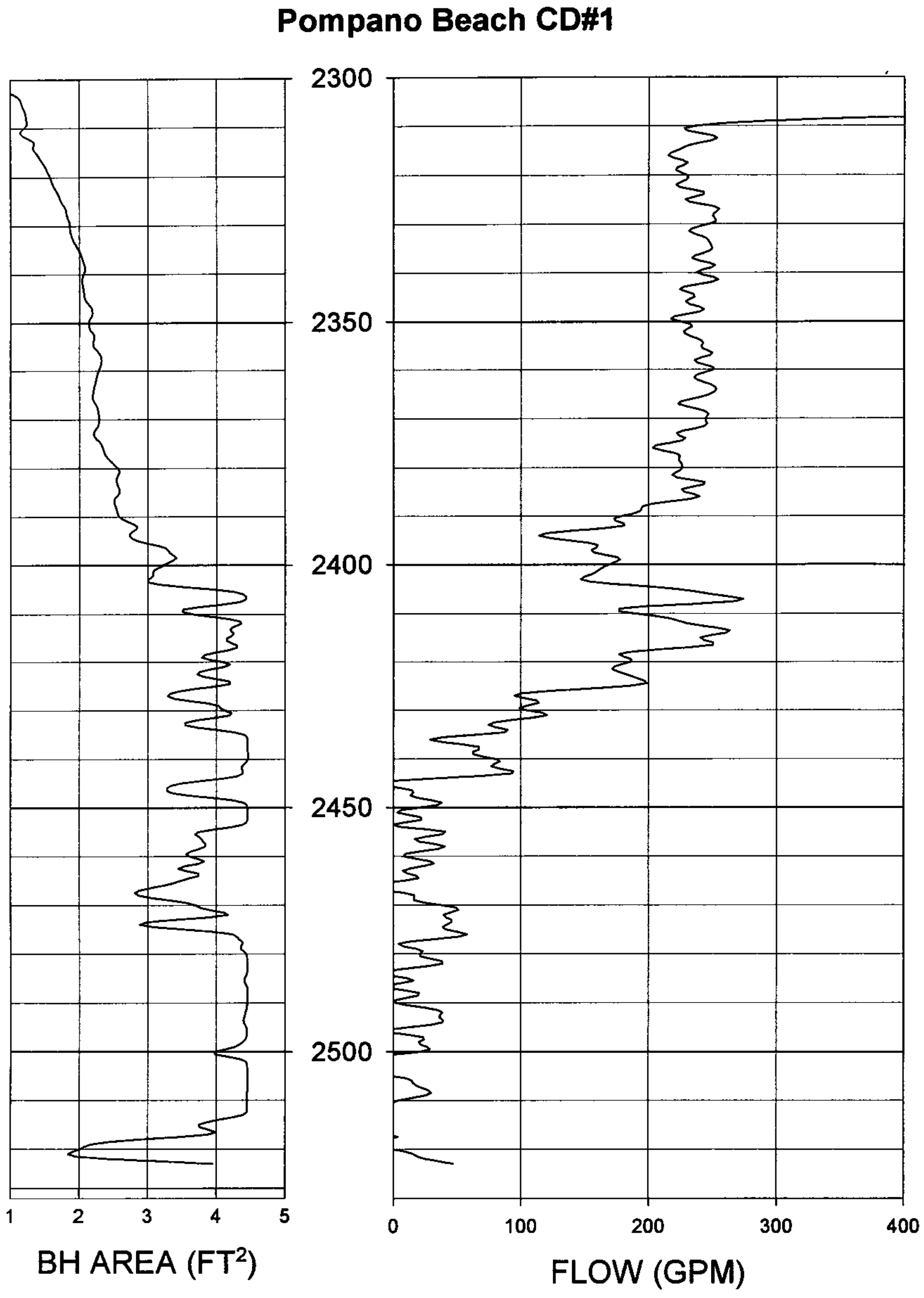

Pompano Beach CD#1
2300
2350
2400
2450
2500
1
2
3
4
5
BH AREA (FT2)
0
100
200
300
400
FLOW (GPM)

FIG 2

Pompano Beach CD#1

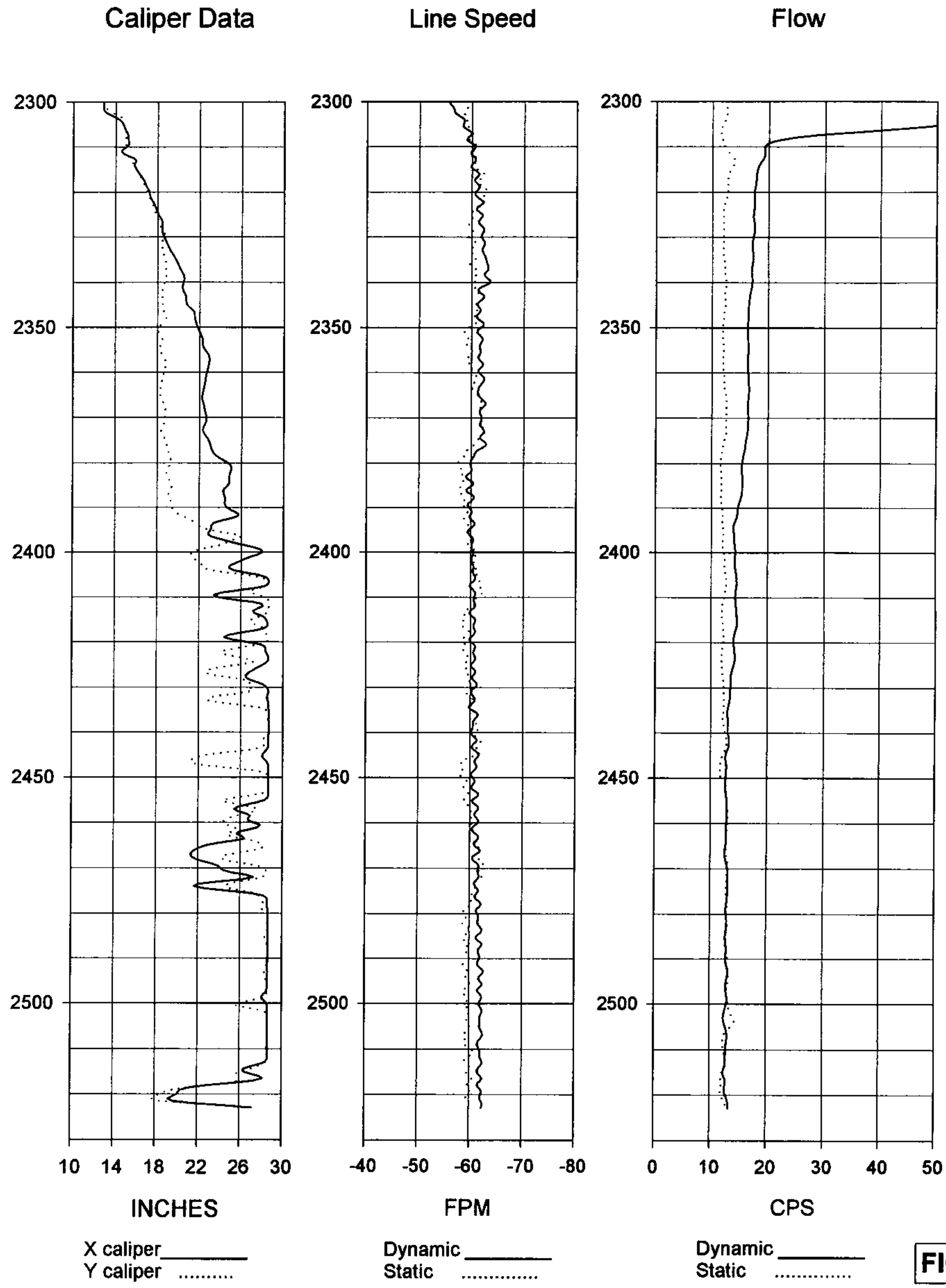
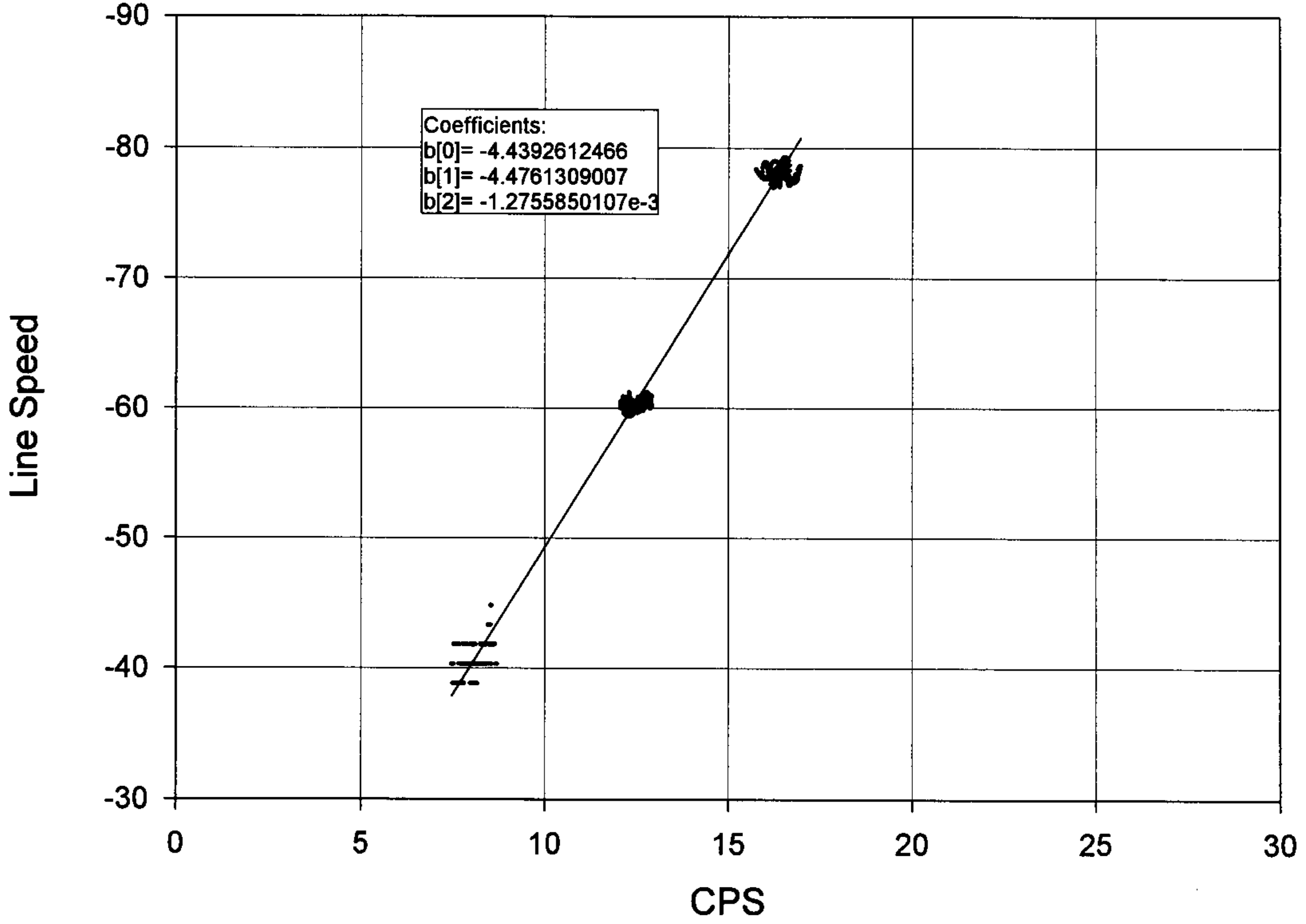


FIG 3

Pompano Beach CD#1 Run 7 Down Cals



Geophysical Logging Quality Control

FLORIDA GEOPHYSICAL LOGGING, INC. 15465 Pine Ridge Road - Fort Myers, Florida (941) 489-0044 Fax (941) 489-4545

LOGGING TOOLS

CALIBRATION THEORY AND PRACTICE

CALIBRATION

Few logging tools give a response immediately useful in formation evaluation. Logging tools generally exert some disturbance on the formation (pass electric current through it, bombard it with sub-atomic particles, etc.). The tools' detectors measure this disturbance after it has passed through the formation. This measurement may be made in counts per second, it is referred to as the raw measurement. Such responses are of limited interest to a geoscientist.

Calibration links this raw measurement to a useful formation property. All calibrations work on the same principle. A tool is placed in environments (usually two) of known physical property and the tool's responses in these environments are measured. An arithmetic relation (usually a straight line) between these points is constructed and used to convert actual measurements to calibrated values. For example, by recording the X-Y Caliper Tool's response (pulses per second, ***raw measurement***) to rings of known size (inches, ***calibrated measurement***); we can derive an equation that will allow measurement of an unknown hole diameter.

The Primary Standard for all logging tools is dependent on the physical property it has been designed to measure. This Primary Standard may be one of the following:

- API standard test pits, such as those found at the University of Houston.
- A test fixture from the tool manufacturer.
- Part of the tool's electronic circuitry.

Each Tool Section in this manual describes the primary standard adopted by Florida Geophysical Logging.

Manufacturing plants and operations bases use Secondary Standards when needed as it is impractical to calibrate, and re-calibrate, each tool in some primary standards such as the Houston API pits. These secondary calibrators are carefully referenced directly to the primary standard.

Some examples of these secondary Standards are :

- The Natural Gamma Ray jig
- The Compensated Neutron water tank
- The Aluminum and Magnesium blocks for density calibrations

CALIBRATION TECHNIQUE

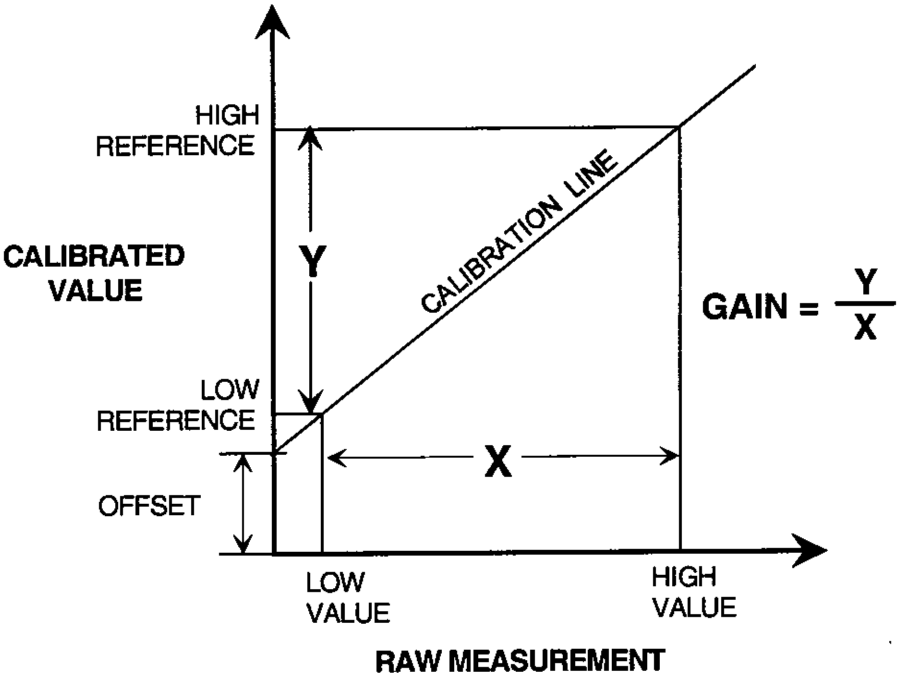
Some tools such as the X-Y Caliper Tool and the Fluid Resistivity Tool use multiple straight line segments to compute calibrated values. These tools use a modified version of the technique described below where a 2 point calibration scheme is described. The Flowmeter Tool is calibrated over 3 points and the data is fit to a quadratic equation.

We express a tool's linear response by:

$$y = mx + b$$

where y = calibrated response of the tool
m = slope or gain of the tool
x = raw value from tool
b = intercept or offset

This linear relationship between raw or measured values and calibrated values is shown
below :



$$Gain = \frac{High\ Cal - Low\ Cal}{High\ Meas - Low\ Meas} \qquad (A)$$

$$Offset\ or\ Intercept = Low\ Cal - (Gain \times Low\ Meas) \qquad (B)$$

VERIFICATION

A verification is exactly what it says it is,: it confirms that the tool response and calibration are still valid. It does not modify the relation between tool response and physical property measurement (i.e., the calibration).

Any verification method has to be fast, accurate, precise and rugged. They are normally done on the catwalk or drill floor, and take rig time.

DUAL INDUCTION TOOL (DIT)

The shop calibration of the Dual Induction Tool (DIT) involves placing the tool in a zero conductivity medium. This is accomplished by elevating the tool on tall wooden stands away from any metal or electrical fields (overhead or underground power lines). The height of the stands depends on ground conductivity which in turn is related to ground moisture content. A distance of 3 meters above the ground will normally remove any ground effect from the measurement. The tool zero conductivity signal is recorded for both deep and medium. Next a calibration loop of known conductivity is placed over the deep and medium sensor. The value of the loop is designed to represent a 500 mmho formation. This provides the “High Cal” value. Field verification is done to verify tool response in between master calibrations.

BOREHOLE COMPENSATED SONIC LOG (BHC)

The primary calibration for the BHC involves centralizing the tool in a section of water-filled steel casing and mechanically adjusting the spacers within the tool until the 4 individual transmitter to receiver pairs read the correct transit time for the 5 foot and 3 foot spacings. This procedure is done when the tool is built or whenever major repairs are performed on the transmitter/receiver section. Normal quality control procedures for all Compensated Sonic Logs requires logging the value of Delta T in the casing either on the way in the hole, or immediately after the logging run. This is an excellent verification that the entire system is functioning properly. Sometimes, this casing check is difficult in pipe that is well bonded. If possible the logging engineer should find a section of "free pipe" to record the casing check.

X-Y CALIPER TOOL (XYT)

The calibration of this is done by opening the caliper arms into two or more rings of known inside diameter, the smaller ring serves as the low calibrate value, the large ring is the high calibrate value. The gain and offset are calculated using the technique presented in the introduction. The size of the caliper rings used in the calibration and verification are selected based on the hole size that is being logged. Several size rings are available.

HIGH RESOLUTION TEMPERATURE TOOL (HRT)

The shop calibration of the HRT uses two water baths of different temperatures. The low temperature bath is chosen to be 32°F because logging a Deep Injection Well we often see borehole temperature in the 40° range. The high temperature bath is normally between 150°F and 212°F. The gain and offset are calculated using the technique presented in the introduction. All the tools Florida Geophysical Logging uses have fast response RTD sensors. The HRT is an extremely stable tool and requires calibration only after major repairs or component replacement. Because of the linearity of the sensor a single point verification made in the field will instantly tell if the tool is still in calibration and capable of recording accurate temperature. This verification should be done in a fluid that has reached temperature equilibrium.

FLUID CONDUCTIVITY TEMPERATURE TOOL (FCT)

The shop calibration of the fluid conductivity measurement involves placing the tool in a series of different salt solutions. The solutions are allowed to reach temperature and salinity equilibrium and are then measured with a precision digital conductivity meter. The tool is placed in each of the solutions and a multi-point calibration is made between tool output in pulses and fluid conductivity. The FCT is an extremely stable tool and requires calibration only after major repairs or component replacement. A single point verification made in the field will instantly tell if the tool is in calibration and capable of recording accurate fluid conductivity. This verification can be done with a water sample obtained from the well.

For calibration of the temperature tool see HRT section.

GAMMA RAY TOOL (GRT)

The primary calibration standard for all gamma ray tools is the API Gamma Ray Test Pit at the University of Houston. The API standard defines the difference between two radioactive formations as 200 Gamma Ray API units. After primary calibration, the tool is removed and moved to a distance away from the pit. A background reading in air is recorded. Next, a small radioactive source is placed at a fixed distance from the detector of the tool. By subtracting the background reading from the response to the radioactive source, a value in API units is assigned to the calibrator or Jig. This Jig can be used to calibrate other tools of similar design without taking it to the API test well.

FLOWMETER TOOL (FMT)

Quantitative analysis of flowmeter measurements requires calibration of the probe. Since the probe is a mechanical system utilizing components that are subject to wear (e.g. bearings) it must be calibrated before every use. Calibration is done by moving the tool at a known velocity through a static fluid column and measuring the number of pulses or counts output from the tool. It is important to calibrate the tool in the same diameter hole that the measurements will be made[1]. Two different velocities are required to establish a calibration line. Florida Geophysical Logging uses three principal velocities (50, 70 and 100 fpm) to establish a calibration line. A second order linear fit of the calibration data is performed. By mathematically fitting a curve through the calibration data points it is possible to "back calculate" an unknown velocity if the number of counts are known. The equation is of the form :

$$V_{fm} = b_0 + \left(b_1 \times counts\right) + \left(b_2 \times counts^2\right) \qquad (3)$$

where b_0 , b_1, and b_2 are the coeficients determined by the linear curve fit routine.

Counts represent the raw signal from the flowmeter tool

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[1] *Application Of The Borehole Flowmeter Method To Measure Spatially Variable Hydraulic Conductivity At The MADE Site - Kenneth R. Rehfeldt, Illinois State Water Survey*

APPENDIX G

VIDEO SURVEY

Television Survey

City of Pompano Beach

Concentrate Disposal System Wells IW–1 & MW-1

Interval (feet bpl)	Observations Concentrate Disposal Well IW–1 Open Hole
1060–1072	**Light colored generally massive Limestone:** No fractures or caverns, weakly vuggy, minor washout at 1,065
1072–1276	**Light colored generally massive Limestone:** No fractures or caverns, generally well indurated, weakly vuggy from 1,111–1,140, minor washout at 1,143, moderately vuggy at 1,143, 1,152, 1,173 and from 1,185 to 1,195. Minor washout at 1,200. Thin dark lamination at 1,231.
1276–1400	**Light colored generally massive Limestone:** No fractures or caverns. Generally well indurated. Dark laminations at 1,298, 1,329 and 1,368.
1400–1417	**Light colored massive Limestone:** No fractures, vuggs or caverns. Well indurated.
1417–1460	**Light colored Limestone:** No fractures or caverns. Generally well indurated. Occasional dark vuggy laminations to thin beds. Weakly vuggy below 1,440. Minor washout at 1,460. Vuggy below 1,550.
1460–1495	**Light colored generally massive Limestone:** No fractures or caverns. Generally well indurated to weakly vuggy. Moderately vuggy to 1,464. Darker colored beds with rougher texture at 1,464 and 1,467. Dark horizontal laminations at 1,475. Thin dark horizontal beds at 1,479, 1,485 and 1,496.
1495–1508	**Light colored Limestone:** No fractures or caverns. Generally vuggy with minor to occasionally prominent bedding features and rare minor washouts.
1508–1520	**Light colored massive Limestone:** No fractures or caverns. Generally well indurated.
1520–1561	**Light colored interbedded Limestone:** No fractures or caverns. Generally well indurated to weakly vuggy. Occasional dark laminations. Coarser grained bed at 1,540. Interbedded Limestone and Dolomite at 1,546. Dark laminations at 1,561.
1561–1578	**Light colored generally massive Limestone:** No fractures, vuggs or caverns. Well indurated with few dark laminations.
1578–1587	**Light colored Limestone:** No fractures or caverns. Dark laminations common. Generally weakly vuggy. Highly vuggy from 1,585 to 1,587.
1587–1600	**Light colored massive Limestone:** No fractures or caverns. Generally well indurated
1600–1629	**Light colored Limestone:** No fractures or caverns. Laminated to thinly bedded. Weakly vuggy to 1,607, highly vuggy below 1,607. Darker bed at 1,614. Minor washout at 1,628.
1629–1663	**Light colored generally massive Limestone:** No fractures or caverns, vuggy. Few faint laminations. Dark lamination at 1,657.

1663–1836	**Light colored interbedded Limestone:** No fractures or caverns. Dominantly light colored interbedded with darker beds and laminations.
1836–1862	**Dark orange bedded Dolomite:** Generally well indurated. Coarser texture at 1,836. Minor cavern at 1,840. Vertical fracture from 1,848 to 1,850. Shallow cavern at 1,859.
1862–1865	**Dark colored massive Dolomite:** Highly fractured with blocky texture. Cavern from 1,865 to 1,869.
1865–1871	**Light colored massive Limestone:** No fractures, generally well indurated. Few Dolomite lenses. Cavern at 1,866.
1871–1956	**No video**
1956–1986	**Light colored generally massive Limestone:** Weakly vuggy to very well indurated with occasional weak bedding features. Closed horizontal fractures at 1,958 and 1,960.
1986–2023	**Dark colored generally massive Dolomite:** Very well indurated to weakly vuggy. Thin wavy laminations at 1,991. Closed horizontal fracture at 1,994, open vertical fracture at 1,997. Highly vuggy with open fractures and blocky texture at 2,009, 2,011, 2,013 and 2,016.
2023–2025	**Light colored massive Limestone:** Generally well indurated, washout at 2,024.
2023–2035	**Dark colored highly fractured Dolomite:** Blocky texture, cavernous at 2,027.
2035–2049	**Dark colored generally massive Dolomite:** Weakly to moderately vuggy, locally weakly to moderately fractured, shallow cavern at 2,038. Highly fractured at 2,049.
2049–2081	**Dark to moderately light colored generally massive Dolomite:** Moderately vuggy to vuggy with few low angle closed fractures. Moderately open moderately dipping fracture at 2,051 highly fractured at 2,053, 2,066 and 2,067. Thin breccia bed at 2,070. Blocky fractured zones at 2,073 and 2,074. Open high angle fracture at 2,076. Highly vuggy at 2,069.
2081–2086	**Dark colored highly fractured Dolomite:** Cavernous with blocky texture.
2086–2110	**Dark to very dark colored massive Dolomite:** Moderately vuggy. Open vertical fractures at 2,093 and 2,098, closed horizontal fracture at 2,099, open horizontal fracture at 2,103, healed horizontal fracture at 2,108
2110–2112	**Light colored generally massive Limestone:** No fractures vuggs or caverns. Thin dark wavy laminations at 2,111
2112–2141	**Dark colored massive Dolomite:** Well indurated, dominantly weakly vuggy. Highly vuggy at 2,113. Low to high angle open fractures from 2,119 to 2,125. Blocky texture with open fractures from 2,125 to 2,127.
2141–2149	**Dark colored highly fractured Dolomite:** Cavernous with blocky texture.
2149–2155	**Light colored dominantly massive Limestone:** Generally vuggy. Occasional closed horizontal fractures from 2,150 to 2,153. Shallow washout at 2,154.
2155-2160	**Light colored dominantly massive Limestone:** No fractures vuggs or caverns. Well

indurated. Few dark laminations from 2,157 to 2,158.

2160–2176	**Dark colored generally massive Dolomite:** Generally moderately vuggy. Highly fractured with blocky texture at 2,160. Closed horizontal fracture at 2,161. Well indurated to weakly vuggy from 2,161 to 2,162. Highly fractured and cavernous with blocky texture at 2,167 and 2,169. Shallow cavern at 2,172. Closed vertical fractures at 2,173. High angle closed fracture at 2175.
2176-2182	**Light colored Limestone interbedded with Dark Dolomite:** Vuggy to highly vuggy from 2,176 to 2,180. Moderately open vertical fracture from 2,176 to 2,178. Dark shallow cavern at 2,179. High angle closed fracture at 2,178. Thin dark blocky bed at 2,180. Moderately vuggy with molds at 2,181.
2182-2183	**Dark colored Dolomite**: Highly fractured, cavernous, blocky texture.
2183–2189	**Dark colored generally massive Dolomite:** No caverns. Generally weakly to moderately vuggy. High angle fully healed fractures at 2,188.
2189-2190	**Light colored massive Limestone**: No fractures, caverns or vuggs
2190-2194	**Dark colored Dolomite:** Highly vuggy. Blocky texture at 2,190 and 2,191 Closed fractures from 2,191 to 2,194.
2194–2215	**Dark colored Dolomite:** Generally weakly to moderately vuggy. Blocky caverns at 2,195 and 2,196. Variable angle closed fractures at 2,199 and 2,200. Open horizontal fracture at 2,200. Closed vertical fracture at 2,201. Thin gray moderately vuggy beds at 2,200 and 2,202. Highly vuggy from 2,202 to 2,203. Closed vertical fracture at 2,204. Moderately fractured with blocky texture at 2,205. Highly vuggy with minor cavern at 2,206. Closed vertical fracture at 2,206. Low angle open fracture and minor washout at 2,208. Minor caverns at 2,211 and 2,212. Fractured with moderate caverns at 2,214.
2215-2218	**Light Gray colored massive Limestone:** Well indurated, weakly vuggy.
2218–2228	**Dark colored Dolomite:** Generally vuggy with some large diameter vuggs. Highly vuggy from 2,225 to 2,226. Moderately fractured with blocky texture at 2,219 and 2,222. Rough texture from 2,224 to 2,228.
2228-2230	**Dark Dolomitic Limestone:** Highly fractured, blocky texture, highly cavernous.
2230-2240	**Light brown Limy Dolomite:** Generally weakly to moderately vuggy. Moderately open vertical fractures at 2,234. Shallow cavern at 2,235. Open vertical fractures at 2,234.
2240–2254	**Dark Massive Dolomite and Limestone:** Moderately vuggy from 2,240 to 2,241, highly vuggy from 2,241 to 2,247. High angle closed fracture at 2,251.
2254–2261	**Dark Massive Dolomite:** Generally weakly to moderately vuggy, highly vuggy at 2,255. Closed low angle fracture at 2,260, high angle closed fracture at 2,261
2261–2266	**Dark Gray Massive Dolomite:** Highly fractured, highly cavernous, blocky texture.
2266–2274	**Light Gray massive Dolomitic Limestone:** Vuggy to highly vuggy. Gray limestone lens at 2,271. Open low angle fracture at 2,272.
2274–2276	**Dark Gray Massive Dolomite:** Highly fractured, highly cavernous, blocky texture.

2276–2284	**Light Gray colored massive Limestone:** Well indurated, vuggy below 2,282. Few minor washouts.
2284–2293	**Dark Gray Massive Dolomite:** No fractures from 2,284 to 2,286. Highly fractured, blocky texture. Vuggy to weakly vuggy
2293–2296	**Light gray massive Limestone:** Very well indurated with few minor washouts.
2296–2297	**Dark Massive Dolomite:** Very well indurated, moderately fractured.
2297–2310	**Light gray massive Limestone:** No fractures or caverns, vuggy to highly vuggy.
2310–2315	**Dark orange massive Limy Dolomite:** Vuggy to moderately vuggy, no fractures or caverns. Dolomite content increasing with depth.
2315–2403	**Light colored generally massive Limestone:** Generally vuggy to moderately vuggy with few minor washouts to 2,338. Dolomitic at 2,346. Well indurated from 2,355 to 2,364. Minor cavern at 2,375. Blocky texture and low angle open fracture at 2,377. High angle moderately open fracture at 2,380. Well indurated from 2,380 to 2,400. Open vertical fracture at 2,400
2403–2527	**Light colored generally massive Limestone:** Blocky texture at 2,405. Blocky texture moderately to highly fractured from 2,406 to 2,427. Shallow cavern at 2,406. Open vertical fracture at 2,411. Highly cavernous from 2,447 to 2,453. Open low angle fracture at 2,450. Well indurated with no fractures from 2,469 to 2,471. Well indurated variably fractured at 2,504. Dolomitic, fractured and blocky at 2,510. Highly fractured and blocky from 2,512 to 2,516 and from 2,518 to 2,521. Highly cavernous from 2,522 to 2,523.
2527–2535	**Dark Dolomite with little light colored Limestone:** Highly fractured with blocky texture.
2535-2582	**Dark colored Dolomite** Brown to dark brown. Highly fractured, blocky and cavernous.
2582-2586	**Dark colored massive Dolomite:** Brown to dark brown. Minor open fractures, weakly vuggy.
2586-2604	**Dark colored Dolomite:** Brown to dark brown. Highly fractured and blocky.
2604–2607	**Dark colored massive Dolomite:** Brown to dark brown. Few minor fractures, weakly vuggy.
2607–2628	**Dark colored Dolomite:** Brown to dark brown. Highly fractured, blocky and cavernous.
2628-2630	**Dark colored massive Dolomite:** Brown to dark brown. Moderately fractured, vuggy.
2630–2648	**Dark colored generally massive Dolomite:** Brown to dark brown. Several open fractures, vuggy with blocky texture. Highly fractured and cavernous from 2630 to 2633.
2648-2669	**Dark colored generally massive Dolomite:** Brown to dark brown. Well indurated, generally moderately vuggy with few minor caverns. Blocky at 2,655. High angle open

	fracture from 2,656 to 2,657. Open horizontal fracture at 2,658. Open vertical fracture from 2,659 to 2,664. Vuggy below 2,664. Blocky texture at 2,668.
2669-2673	**Dark colored Dolomite:** Brown to dark brown. Highly fractured, blocky.
2673-2679	**Dark colored massive Dolomite:** Brown to dark brown. Vuggy with some moderate caverns. Open vertical fracture from 2,674 to 2,678.
2679-2685	**Dark colored Dolomite:** Brown to dark brown. Generally highly fractured, blocky texture.
2685-2692	**Dark colored massive Dolomite:** Brown to dark brown. Generally vuggy with few open horizontal and high angle fractures.
2692-2715	**Dark colored Dolomite:** Brown to dark brown. Highly fractured, moderately cavernous, blocky.
2715–2733	**Dark colored Dolomite:** Brown to dark brown. Moderately to highly fractured, moderately vuggy, blocky with shallow caverns.
2733–2749	**Dark colored Dolomite:** Brown to dark brown. Generally well indurated. Highly fractured and blocky at 2,739. Weakly fractured at 2,741. Light colored Limestone lens at 2,744.
2749–2767	**Light colored interbedded Limestone:** Generally well indurated. Interbedded with gray limestone laminations and lenses
2749–2895	**Light colored generally massive Limestone:** Generally very well indurated. Dolomitic from 2,775 to 2,780. Closed high angle fracture at 2,788. Closed high angle fracture at 2,815. Closed horizontal fractures at 2,819. Weakly Dolomitic at 2832 and 2840. Closed horizontal fractures at 2,855 and 2,856. Closed vertical fracture at 2,871. Dolomite laminations at 2,877. Closed high angle fracture at 2,881. Dolomite laminations at 2,885. Closed horizontal fracture at 2,885. Closed high angle fracture at 2,889.

Interval (feet bpl)	**Observations Concentrate Disposal Well IW–1 16–inch Diameter Tubing**
0–2273	**No visible defects or damage:** Packer assembly appears to be properly set.

Interval (feet bpl)	**Observations Dual-Zone Monitoring Well MW-1 Open Hole**
1520–1536	**Light colored generally massive Limestone:** Dominantly well indurated to weakly vuggy. No, fractures or caverns. Thin Dolomite bed at 1,536.
1536–1545	**Dark Dolomite interbedded with light Limestone:** No fractures. Generally moderately vuggy. . Light colored limestone beds at 1,537 and 1,539. Well indurated at 1,540. Vuggy to highly vuggy with minor caverns at 1,542. Interbedded Dolomite and Limestone from 1,544 to 1,545.
1545–1582	**Light colored generally massive Limestone:** Generally well indurated to weakly vuggy. No fractures or caverns. Dark lenses at 1,555. Dark laminations at 1,560. Washout at 1,562. Vuggy from 1,562 to 1,654. Minor washout at 1,582.
1582–1586	**Dark colored massive Limestone:** Vuggy, no fractures or caverns
1586–1663	**Light colored generally massive Limestone:** Generally well indurated. No fractures or caverns. Dark lenses at 1,603. Minor washout at 1,622. Dark lenses from 1,642 to 1,646. Weakly vuggy from 1,646 to 1,651. Dark bed at 1,657. Thin gray bed at 1,663.
1663–1666	**Dark colored massive Limestone:** Vuggy. No fractures or caverns.
1666–1809	**Light colored Limestone:** Generally well indurated. No fractures or caverns. Dark mudstone lenses at 1,679. Dark thin bed at 1,684. Dark lenses at 1,690. Weakly vuggy from 1,695 to 1,698. Dark lamination at 1,706. Dark mudstone lamination at 1,711. Dolomitic from 1,729 to 1,730. Thin vuggy Dolomite bed at 1,736. Dolomitic laminations at 1,750. Vuggy at 1,753. Dark thin Dolomite bed at 1,760. Dolomitic at 1,766. Dolomitic and weakly vuggy at 1,771, 1,784 and 1,788. Laminated and Dolomitic at 1,790.
1809–1840	**Light Limestone interbedded with dark Dolomite:** Generally well indurated. No fractures or caverns. Thick dark lamination at 1,821. Dark Dolomite beds at 1,829 and 1,838. Laminated Limestone and Dolomite from 1,839 to 1,840.
1840–1865	**Dark colored Dolomite:** No fractures or caverns. Generally highly vuggy. No fractures or caverns. Thin Limestone bed at 1,844. Limy from 1,845 to 1,852. Moderately to weakly vuggy from 1,863 to 1,865
1865–1868	**Light colored bedded Limestone:** No, fractures or caverns. Generally well indurated.
1868–1882	**Dark colored Dolomite:** No fractures or caverns. Generally well indurated to 1,870. Vuggy below 1,870. Rougher texture from 1,871 to 1,875. Moderate cavern at 1,880. Open low angle fractures at 1,880 and 1,883.
1882–1892	**Light colored generally massive Limestone:** Generally well indurated. No fractures or caverns. Thin laminations at 1,886.
1892–1893	**Dark colored Dolomite:** No fractures or caverns, vuggy.
1893–1900	**Light colored generally massive Limestone:** Generally well indurated. No fractures or caverns. Dolomitic inclusions at 1,894

1900–1915	**Dark colored Dolomite:** No fractures, moderately vuggy. Minor caverns at 1,913.
1915–1923	**Light colored generally massive Limestone:** Generally well indurated. No fractures or caverns.
1923–1925	**Dark colored Dolomite:** Well indurated. Blocky texture
1925–1950	**Light colored generally massive Dolomitic Limestone:** Generally well indurated. No fractures or caverns.

APPENDIX H

PACKER TEST DATA AND GRAPHS

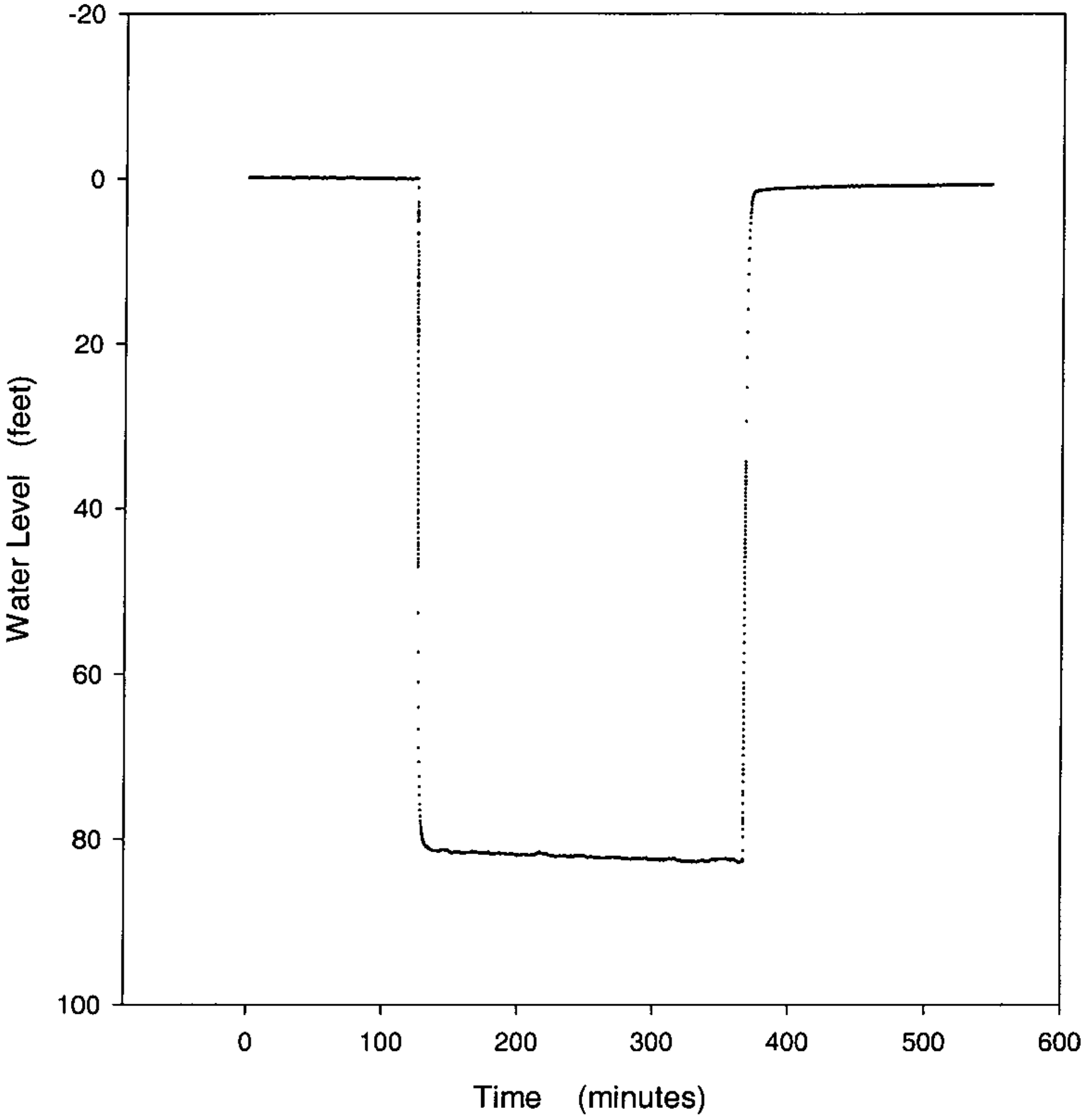
Appendix H

Straddle Packer Test No. 1 @ IW-1

1,631 - 1,647

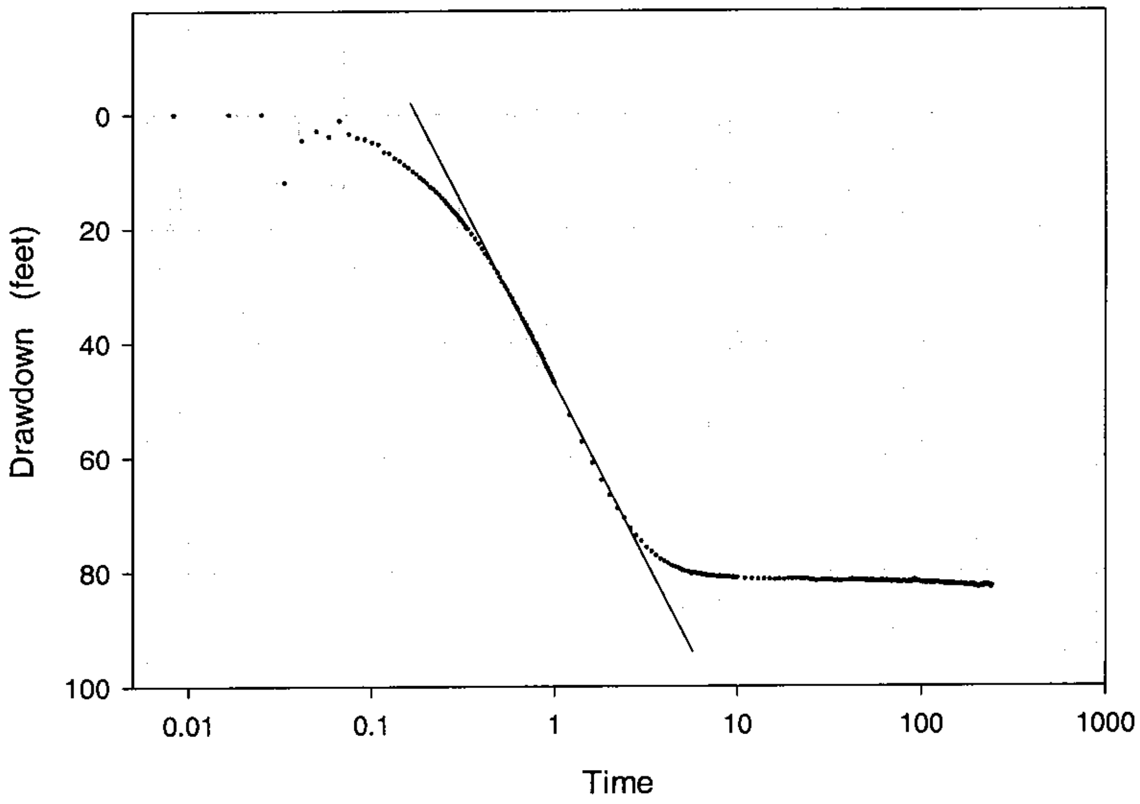
POMPANO BEACH
IW-1
1,631 - 1,647

BACKGROUND, DRAWDOWN AND RECOVERY



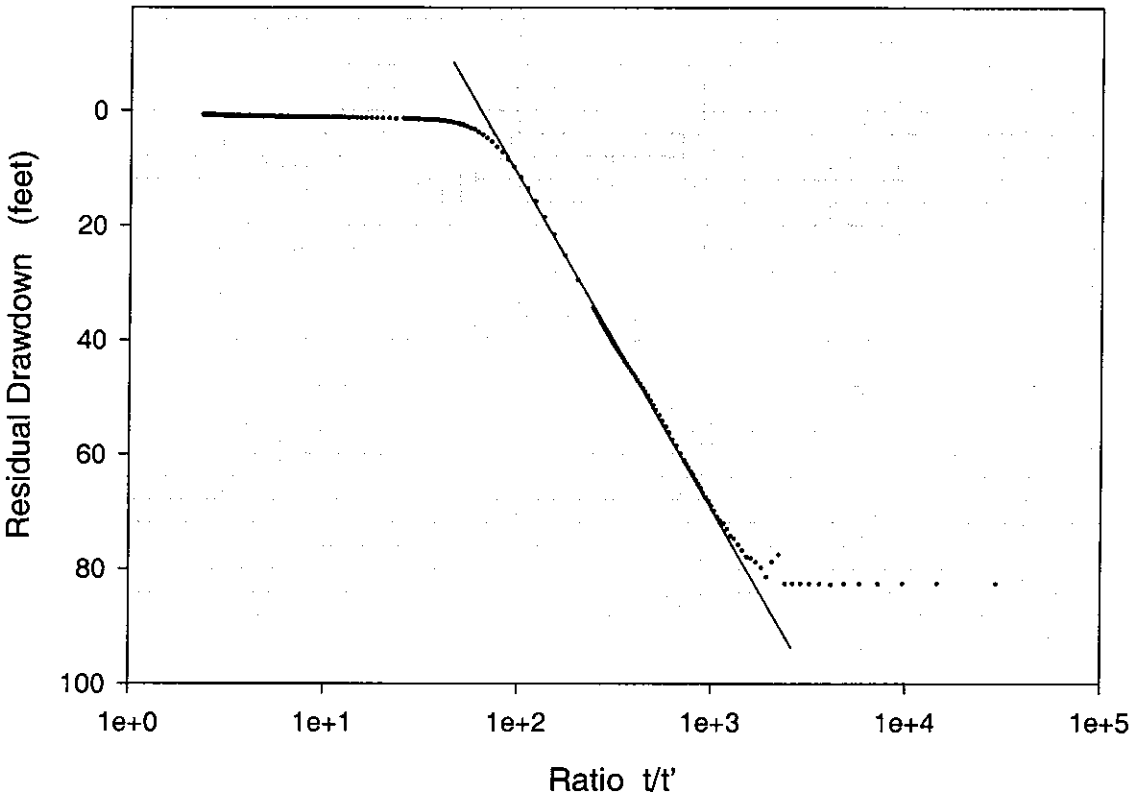
POMPANO BEACH
IW-1
1631 - 1647

DRAWDOWN



POMPANO BEACH
IW-1
1,631 - 1,647

RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1,631 - 1,647
BACKGROUND DATA

Time (minutes)	Water Level (feet)
0	-0.156
0.0083	-0.156
0.0166	-0.156
0.025	-0.156
0.0333	-0.156
0.0416	-0.156
0.05	-0.156
0.0583	-0.156
0.0666	-0.156
0.075	-0.156
0.0833	-0.156
0.0916	-0.156
0.1	-0.156
0.1083	-0.156
0.1166	-0.156
0.125	-0.156
0.1333	-0.156
0.1416	-0.156
0.15	-0.156
0.1583	-0.156
0.1666	-0.156
0.175	-0.156
0.1833	-0.156
0.1916	-0.156
0.2	-0.156
0.2083	-0.156
0.2166	-0.156
0.225	-0.156
0.2333	-0.156
0.2416	-0.156
0.25	-0.156
0.2583	-0.156
0.2666	-0.156
0.275	-0.156
0.2833	-0.156
0.2916	-0.156
0.3	-0.156
0.3083	-0.156
0.3166	-0.156
0.325	-0.156
0.3333	-0.156
0.35	-0.156
0.3666	-0.156
0.3833	-0.156
0.4	-0.156
0.4166	-0.078
0.4333	-0.156
0.45	-0.156
0.4666	-0.156
0.4833	-0.156
0.5	-0.156
0.5166	-0.156
0.5333	-0.156
0.55	-0.156
0.5666	-0.156
0.5833	-0.156
0.6	-0.156
0.6166	-0.156
0.6333	-0.156
0.65	-0.156
0.6666	-0.156
0.6833	-0.156
0.7	-0.156
0.7166	-0.156
0.7333	-0.156
0.75	-0.156
0.7666	-0.156
0.7833	-0.156
0.8	-0.156
0.8166	-0.156
0.8333	-0.156
0.85	-0.156
0.8666	-0.156
0.8833	-0.156
0.9	-0.156
0.9166	-0.156
0.9333	-0.156
0.95	-0.156
0.9666	-0.156
0.9833	-0.156
1	-0.156
1.2	-0.156
1.4	-0.156
1.6	-0.156
1.8	-0.156
2	-0.156
2.2	-0.156
2.4	-0.156
2.6	-0.156
2.8	-0.156
3	-0.156
3.2	-0.156
3.4	-0.156
3.6	-0.156
3.8	-0.156
4	-0.156
4.2	-0.156
4.4	-0.156
4.6	-0.156
4.8	-0.156
5	-0.156
5.2	-0.156
5.4	-0.156
5.6	-0.156
5.8	-0.156
6	-0.156
6.2	-0.156
6.4	-0.078
6.6	-0.156
6.8	-0.156
7	-0.078
7.2	-0.156
7.4	-0.156
7.6	-0.156
7.8	-0.156
8	-0.156
8.2	-0.156
8.4	-0.156
8.6	-0.156
8.8	-0.156
9	-0.078
9.2	-0.156
9.4	-0.156
9.6	-0.156
9.8	-0.156
10	-0.156
11	-0.078
12	-0.078
13	-0.078
14	-0.078
15	-0.078
16	-0.078
17	-0.078
18	-0.078
19	-0.078
20	-0.078
21	-0.078
22	-0.078
23	-0.078
24	-0.078
25	-0.078
26	-0.078
27	-0.078
28	-0.078
29	-0.078
30	-0.078
31	-0.078
32	0
33	0
34	-0.078
35	-0.078
36	-0.078
37	-0.078
38	-0.078
39	-0.078
40	-0.078
41	-0.078
42	-0.078
43	-0.078
44	0
45	-0.078
46	-0.078
47	-0.078
48	-0.078
49	-0.078
50	-0.078
51	-0.078
52	-0.078
53	-0.078
54	0
55	-0.078
56	-0.078
57	0
58	-0.078
59	-0.078
60	-0.078
61	-0.078
62	-0.078
63	-0.078
64	-0.078
65	0
66	0
67	0
68	0
69	0
70	0
71	-0.078
72	-0.078
73	-0.078
74	-0.078
75	-0.078
76	-0.078
77	-0.078
78	-0.078
79	0
80	0
81	0
82	-0.078
83	-0.078
84	-0.078
85	0
86	0
87	-0.078
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0
104	0
105	0
106	0
107	0
108	0.078
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0.078
118	0
119	0
120	0.078
121	0.078
122	0
123	0
124	0
125	0

POMPANO BEACH
IW-1
1,631 - 1,647
DRAWDOWN DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	0	0.8166	41.234	23	81.387	92	81.542	161	82.32	230	82.32
0.0083	0	0.8333	41.857	24	81.309	93	81.698	162	82.32	231	82.475
0.0166	0	0.85	42.324	25	81.542	94	81.698	163	82.397	232	82.397
0.025	0	0.8666	42.947	26	81.542	95	81.776	164	82.32	233	82.553
0.0333	11.933	0.8833	43.648	27	81.698	96	81.776	165	82.397	234	82.475
0.0416	4.524	0.9	44.193	28	81.62	97	81.776	166	82.242	235	82.475
0.05	2.886	0.9166	44.583	29	81.542	98	81.853	167	82.397	236	82.475
0.0583	3.9	0.9333	45.05	30	81.542	99	81.931	168	82.397	237	82.631
0.0666	1.092	0.95	45.595	31	81.62	100	82.009	169	82.32	238	82.631
0.075	3.354	0.9666	46.14	32	81.542	101	82.009	170	82.32	239	82.864
0.0833	4.134	0.9833	46.607	33	81.62	102	81.931	171	82.242	240	82.786
0.0916	4.29	1	47.074	34	81.698	103	82.086	172	82.475	241	82.708
0.1	4.914	1.2	52.68	35	81.62	104	82.086	173	82.397	242	82.631
0.1083	5.226	1.4	57.35	36	81.698	105	82.086	174	82.397		
0.1166	6.63	1.6	61.008	37	81.62	106	82.086	175	82.475		
0.125	6.786	1.8	64.042	38	81.62	107	82.009	176	82.397		
0.1333	7.722	2	66.687	39	81.62	108	82.086	177	82.475		
0.1416	8.19	2.2	68.944	40	81.62	109	82.086	178	82.475		
0.15	8.892	2.4	70.655	41	81.62	110	82.009	179	82.475		
0.1583	9.36	2.6	72.444	42	81.465	111	81.931	180	82.475		
0.1666	9.983	2.8	73.688	43	81.542	112	82.086	181	82.553		
0.175	10.451	3	74.699	44	81.62	113	82.086	182	82.475		
0.1833	11.075	3.2	75.788	45	81.542	114	82.164	183	82.475		
0.1916	11.543	3.4	76.488	46	81.62	115	82.009	184	82.553		
0.2	12.089	3.6	77.188	47	81.62	116	82.164	185	82.475		
0.2083	12.713	3.8	77.81	48	81.62	117	82.164	186	82.397		
0.2166	13.025	4	78.199	49	81.62	118	82.009	187	82.397		
0.225	13.648	4.2	78.588	50	81.698	119	82.086	188	82.32		
0.2333	14.116	4.4	78.976	51	81.62	120	81.931	189	82.397		
0.2416	14.662	4.6	79.21	52	81.698	121	82.009	190	82.397		
0.25	15.13	4.8	79.443	53	81.698	122	82.009	191	82.32		
0.2583	15.675	5	79.754	54	81.542	123	82.009	192	82.32		
0.2666	16.221	5.2	79.909	55	81.776	124	82.009	193	82.475		
0.275	16.767	5.4	80.065	56	81.776	125	82.009	194	82.553		
0.2833	17.157	5.6	80.376	57	81.776	126	82.086	195	82.553		
0.2916	17.624	5.8	80.22	58	81.776	127	82.164	196	82.553		
0.3	18.248	6	80.376	59	81.776	128	82.242	197	82.708		
0.3083	18.56	6.2	80.454	60	81.698	129	82.164	198	82.631		
0.3166	19.106	6.4	80.531	61	81.698	130	82.086	199	82.708		
0.325	19.651	6.6	80.531	62	81.62	131	82.164	200	82.708		
0.3333	20.119	6.8	80.687	63	81.776	132	82.164	201	82.631		
0.35	20.976	7	80.687	64	81.698	133	82.32	202	82.631		
0.3666	21.834	7.2	80.765	65	81.698	134	82.242	203	82.708		
0.3833	22.691	7.4	80.765	66	81.698	135	82.164	204	82.631		
0.4	23.626	7.6	80.843	67	81.776	136	82.32	205	82.786		
0.4166	24.484	7.8	80.92	68	81.853	137	82.242	206	82.708		
0.4333	25.185	8	80.843	69	81.853	138	82.32	207	82.708		
0.45	26.12	8.2	80.843	70	81.776	139	82.32	208	82.786		
0.4666	26.978	8.4	80.92	71	81.853	140	82.32	209	82.708		
0.4833	27.757	8.6	80.998	72	81.776	141	82.242	210	82.631		
0.5	28.614	8.8	80.92	73	81.853	142	82.242	211	82.631		
0.5166	29.393	9	80.998	74	81.853	143	82.32	212	82.553		
0.5333	30.094	9.2	80.998	75	82.009	144	82.164	213	82.553		
0.55	30.796	9.4	81.076	76	81.853	145	82.242	214	82.708		
0.5666	31.653	9.6	80.998	77	81.931	146	82.164	215	82.631		
0.5833	32.276	9.8	81.154	78	81.931	147	82.164	216	82.708		
0.6	33.055	10	81.076	79	81.853	148	82.32	217	82.708		
0.6166	33.756	11	81.231	80	81.853	149	82.164	218	82.631		
0.6333	34.38	12	81.309	81	81.853	150	82.32	219	82.475		
0.65	35.081	13	81.387	82	81.853	151	82.242	220	82.475		
0.6666	35.782	14	81.387	83	81.931	152	82.242	221	82.397		
0.6833	36.483	15	81.387	84	81.931	153	82.32	222	82.553		
0.7	37.028	16	81.465	85	81.931	154	82.397	223	82.475		
0.7166	37.729	17	81.387	86	81.853	155	82.32	224	82.397		
0.7333	38.274	18	81.465	87	81.853	156	82.397	225	82.397		
0.75	38.975	19	81.309	88	81.931	157	82.32	226	82.397		
0.7666	39.598	20	81.309	89	81.776	158	82.397	227	82.397		
0.7833	40.222	21	81.309	90	81.776	159	82.397	228	82.397		
0.8	40.611	22	81.309	91	81.62	160	82.397	229	82.397		

POMPANO BEACH
IW-1
1,631 - 1,647
RECOVERY DATA

Time (minutes)	Water Level (feet)
0	82.553
0.0083	82.553
0.0166	82.475
0.025	82.553
0.0333	82.631
0.0416	82.631
0.05	82.631
0.0583	82.708
0.0666	82.631
0.075	82.553
0.0833	82.553
0.0916	82.553
0.1	82.631
0.1083	77.499
0.1166	78.821
0.125	81.387
0.1333	79.754
0.1416	78.821
0.15	78.121
0.1583	77.888
0.1666	76.799
0.175	75.71
0.1833	74.699
0.1916	74.233
0.2	73.066
0.2083	72.133
0.2166	71.588
0.225	70.966
0.2333	69.877
0.2416	69.021
0.25	68.243
0.2583	67.543
0.2666	66.765
0.275	65.987
0.2833	65.209
0.2916	64.509
0.3	63.653
0.3083	63.109
0.3166	62.33
0.325	61.708
0.3333	61.085
0.35	59.84
0.3666	58.595
0.3833	57.506
0.4	56.26
0.4166	55.171
0.4333	54.159
0.45	53.225
0.4666	52.291
0.4833	51.434
0.5	50.578
0.5166	49.799
0.5333	49.099
0.55	48.398
0.5666	47.775
0.5833	47.152
0.6	46.451
0.6166	45.906
0.6333	45.361
0.65	44.816
0.6666	44.271
0.6833	43.804
0.7	43.181
0.7166	42.714
0.7333	42.169
0.75	41.623
0.7666	41.078
0.7833	40.611
0.8	40.066
0.8166	39.598
0.8333	39.053
0.85	38.586
0.8666	38.119
0.8833	37.651
0.9	37.106
0.9166	36.717
0.9333	36.171
0.95	35.704
0.9666	35.236
0.9833	34.847
1	34.38
1.2	29.471
1.4	25.341
1.6	21.678
1.8	18.56
2	15.831
2.2	13.57
2.4	11.621
2.6	9.905
2.8	8.502
3	7.254
3.2	6.318
3.4	5.46
3.6	4.758
3.8	4.212
4	3.744
4.2	3.276
4.4	3.042
4.6	2.73
4.8	2.496
5	2.34
5.2	2.184
5.4	2.106
5.6	1.95
5.8	1.872
6	1.794
6.2	1.794
6.4	1.716
6.6	1.638
6.8	1.638
7	1.638
7.2	1.638
7.4	1.638
7.6	1.56
7.8	1.56
8	1.56
8.2	1.56
8.4	1.482
8.6	1.56
8.8	1.482
9	1.482
9.2	1.482
9.4	1.482
9.6	1.482
9.8	1.482
10	1.404
11	1.482
12	1.404
13	1.404
14	1.404
15	1.326
16	1.326
17	1.326
18	1.326
19	1.248
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29	1.17
30	1.17
31	1.17
32	1.17
33	1.17
34	1.17
35	1.17
36	1.17
37	1.17
38	1.092
39	1.17
40	1.092
41	1.092
42	1.092
43	1.092
44	1.092
45	1.014
46	1.092
47	1.092
48	1.092
49	1.092
50	1.014
51	1.092
52	1.092
53	1.092
54	1.092
55	1.014
56	1.014
57	1.014
58	1.014
59	1.014
60	1.014
61	1.014
62	1.014
63	1.014
64	1.092
65	1.014
66	1.014
67	1.014
68	1.014
69	1.014
70	1.014
71	1.014
72	0.936
73	1.014
74	0.936
75	0.936
76	1.014
77	0.936
78	0.858
79	1.014
80	0.936
81	0.936
82	0.936
83	1.014
84	0.936
85	0.936
86	0.936
87	0.936
88	0.936
89	0.936
90	0.936
91	0.936
92	0.858
93	0.936
94	0.936
95	0.936
96	0.936
97	0.858
98	0.936
99	0.936
100	0.936
101	0.858
102	0.858
103	0.936
104	0.858
105	0.936
106	0.936
107	0.936
108	0.858
109	0.936
110	0.858
111	0.858
112	0.858
113	0.858
114	0.936
115	0.858
116	0.858
117	0.858
118	0.936
119	0.858
120	0.858
121	0.858
122	0.858
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125	0.858
126	0.858
127	0.858
128	0.858
129	0.858
130	0.858
131	0.858
132	0.858
133	0.858
134	0.78
135	0.858
136	0.858
137	0.858
138	0.858
139	0.858
140	0.78
141	0.858
142	0.858
143	0.858
144	0.78
145	0.78
146	0.858
147	0.78
148	0.78
149	0.78
150	0.858
151	0.78
152	0.78
153	0.78
154	0.78
155	0.78
156	0.78
157	0.702
158	0.858
159	0.78
160	0.78
161	0.78
162	0.78
163	0.702
164	0.78
165	0.78
166	0.78
167	0.78
168	0.78
169	0.78
170	0.702
171	0.702
172	0.702
173	0.78
174	0.78
175	0.78
176	0.78
177	0.78
178	0.702
179	0.78
180	0.702
181	0.702

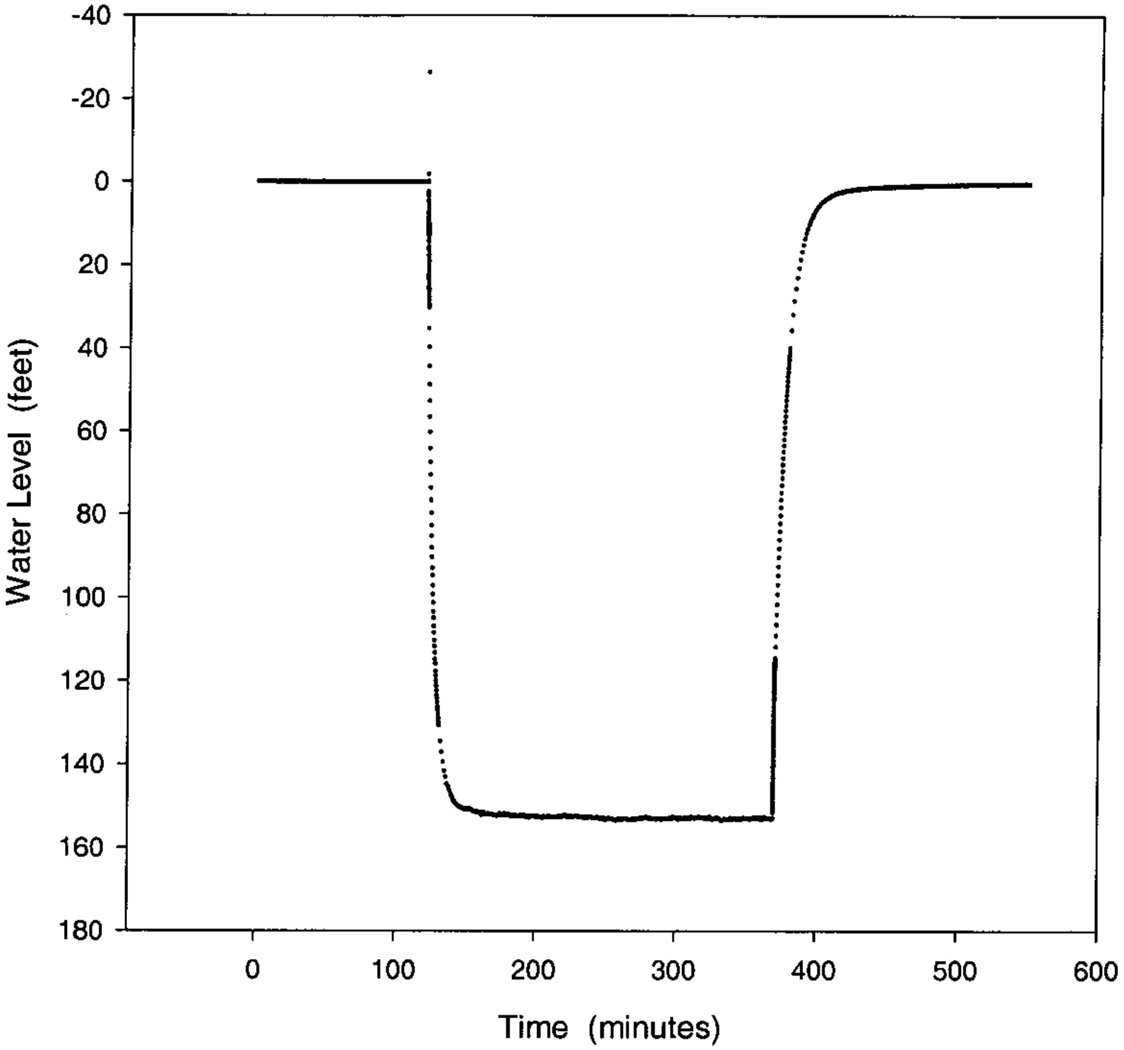
Appendix H

Straddle Packer Test No. 2 @ IW-1

1,731 - 1,747

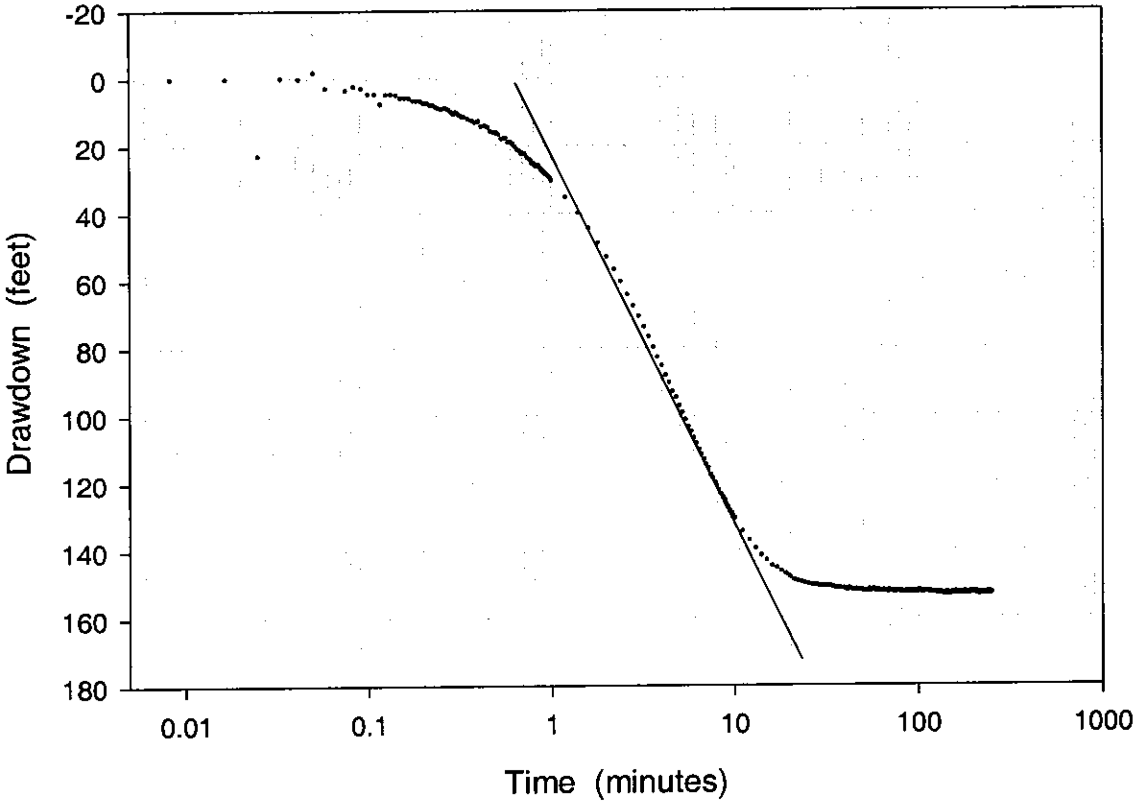
POMPANO BEACH
IW-1
1,731 - 1,747

BACKGROUND, DRAWDOWN AND RECOVERY



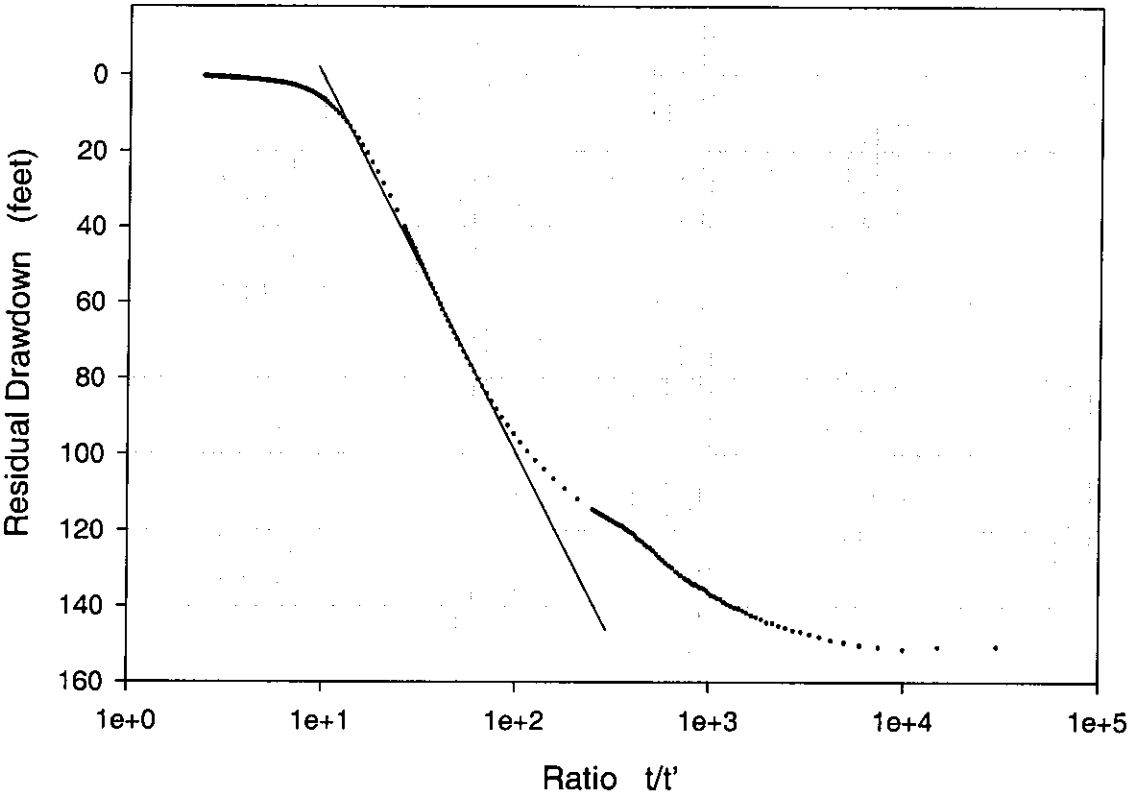
POMPANO BEACH
IW-1
1731 - 1747

DRAWDOWN



POMPANO BEACH
IW-1
1,731 - 1,747

RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1,731 - 1,747
BACKGROUND DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.078	0.8166	-0.156	23	-0.078	92	0.078
0.0083	-0.078	0.8333	-0.078	24	-0.078	93	0.078
0.0166	-0.078	0.85	-0.078	25	0	94	0.078
0.025	-0.078	0.8666	-0.156	26	0	95	0.078
0.0333	-0.078	0.8833	-0.078	27	0	96	0.078
0.0416	-0.078	0.9	-0.078	28	0	97	0.078
0.05	-0.156	0.9166	-0.156	29	-0.078	98	0.078
0.0583	-0.078	0.9333	-0.078	30	0	99	0.078
0.0666	-0.078	0.95	-0.156	31	0	100	0.078
0.075	-0.078	0.9666	-0.078	32	-0.078	101	0.078
0.0833	-0.078	0.9833	-0.078	33	-0.078	102	0.078
0.0916	-0.078	1	-0.078	34	0	103	0.078
0.1	-0.156	1.2	-0.078	35	0	104	0.078
0.1083	-0.078	1.4	-0.078	36	0	105	0.078
0.1166	-0.078	1.6	-0.078	37	0	106	0.078
0.125	-0.078	1.8	-0.078	38	0	107	0.078
0.1333	-0.078	2	-0.156	39	0	108	0.078
0.1416	-0.156	2.2	-0.078	40	0	109	0.078
0.15	-0.156	2.4	-0.078	41	0	110	0.078
0.1583	-0.078	2.6	-0.078	42	0	111	0.078
0.1666	-0.156	2.8	-0.078	43	0	112	0.078
0.175	-0.078	3	-0.156	44	0	113	0.078
0.1833	-0.078	3.2	-0.078	45	0	114	0.078
0.1916	-0.078	3.4	-0.156	46	-0.078	115	0.078
0.2	-0.156	3.6	-0.078	47	0	116	0.078
0.2083	-0.078	3.8	-0.078	48	0	117	0.078
0.2166	-0.156	4	-0.078	49	0	118	0.078
0.225	-0.078	4.2	-0.156	50	0	119	0.078
0.2333	-0.078	4.4	-0.078	51	0	120	0.078
0.2416	-0.078	4.6	-0.078	52	0	121	0
0.25	-0.156	4.8	-0.078	53	0		
0.2583	-0.078	5	-0.078	54	0		
0.2666	-0.156	5.2	-0.078	55	0		
0.275	-0.078	5.4	-0.078	56	0		
0.2833	-0.078	5.6	-0.078	57	0		
0.2916	-0.078	5.8	-0.078	58	0		
0.3	-0.156	6	-0.078	59	0		
0.3083	-0.156	6.2	-0.078	60	0		
0.3166	-0.078	6.4	-0.078	61	0		
0.325	-0.156	6.6	-0.078	62	0		
0.3333	-0.078	6.8	-0.078	63	0		
0.35	-0.078	7	-0.078	64	0		
0.3666	-0.078	7.2	-0.078	65	0		
0.3833	-0.078	7.4	-0.078	66	0.078		
0.4	-0.078	7.6	-0.156	67	0		
0.4166	-0.078	7.8	-0.078	68	0.078		
0.4333	-0.078	8	-0.078	69	0		
0.45	-0.078	8.2	-0.078	70	0		
0.4666	-0.078	8.4	-0.078	71	0		
0.4833	-0.078	8.6	-0.078	72	0		
0.5	-0.078	8.8	-0.078	73	0		
0.5166	-0.078	9	-0.078	74	0		
0.5333	-0.078	9.2	-0.078	75	0		
0.55	-0.078	9.4	-0.156	76	0		
0.5666	-0.156	9.6	-0.078	77	0.078		
0.5833	-0.078	9.8	-0.078	78	0		
0.6	-0.078	10	-0.078	79	0		
0.6166	-0.078	11	-0.078	80	0.078		
0.6333	-0.078	12	-0.078	81	0		
0.65	-0.078	13	0	82	0		
0.6666	-0.078	14	0	83	0.078		
0.6833	-0.156	15	-0.078	84	0.078		
0.7	-0.078	16	0	85	0.078		
0.7166	-0.078	17	-0.078	86	0.078		
0.7333	-0.078	18	0	87	0.078		
0.75	-0.078	19	0	88	0		
0.7666	-0.078	20	0	89	0		
0.7833	-0.078	21	0	90	0.078		
0.8	-0.156	22	0	91	0.078		

POMPANO BEACH
IW-1
1,731 - 1,747
DRAWDOWN DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0.0083	0	0.8333	25.881	24	149.91	93	152.545	162	152.855	231	153.01
0.0166	0	0.85	25.881	25	150.065	94	152.545	163	153.01	232	153.01
0.025	22.764	0.8666	26.427	26	150.375	95	152.622	164	152.932	233	153.087
0.0333	-0.156	0.8833	27.05	27	150.452	96	152.545	165	153.01	234	153.01
0.0416	0.078	0.9	27.595	28	150.452	97	152.39	166	153.165	235	152.777
0.05	-1.872	0.9166	27.829	29	150.84	98	152.7	167	152.932	236	152.855
0.0583	2.885	0.9333	28.374	30	150.762	99	152.467	168	153.01	237	152.777
0.0666	-26.3	0.95	28.608	31	150.607	100	152.39	169	153.01	238	152.777
0.075	3.431	0.9666	29.231	32	150.84	101	152.157	170	153.242	239	152.932
0.0833	2.339	0.9833	29.621	33	150.762	102	152.467	171	153.01	240	152.7
0.0916	2.807	1	30.244	34	150.995	103	152.622	172	153.087	241	153.242
0.1	4.601	1.2	35.229	35	151.15	104	152.622	173	152.932	242	153.087
0.1083	4.679	1.4	39.824	36	151.305	105	152.39	174	153.01	243	152.622
0.1166	7.564	1.6	44.418	37	151.227	106	152.7	175	153.01	244	152.855
0.125	4.757	1.8	48.855	38	151.537	107	152.545	176	152.855	245	152.932
0.1333	4.679	2	52.824	39	151.46	108	152.39	177	153.087	246	152.932
0.1416	4.913	2.2	56.638	40	151.692	109	152.39	178	152.622	247	153.01
0.15	5.693	2.4	60.295	41	152.08	110	152.545	179	152.855	248	153.087
0.1583	5.771	2.6	64.184	42	151.46	111	152.467	180	152.777	249	152.855
0.1666	5.849	2.8	67.529	43	151.77	112	152.545	181	152.855		
0.175	6.551	3	70.562	44	151.925	113	152.545	182	153.165		
0.1833	6.628	3.2	73.673	45	151.847	114	152.777	183	152.7		
0.1916	6.628	3.4	76.628	46	151.77	115	152.855	184	152.932		
0.2	7.174	3.6	79.815	47	152.002	116	152.622	185	153.087		
0.2083	7.252	3.8	82.769	48	151.925	117	152.777	186	152.855		
0.2166	7.798	4	85.256	49	152.002	118	152.622	187	152.855		
0.225	7.798	4.2	88.132	50	152.235	119	152.622	188	152.855		
0.2333	8.5	4.4	90.307	51	152.235	120	152.7	189	152.7		
0.2416	8.812	4.6	92.949	52	152.312	121	152.7	190	153.087		
0.25	9.046	4.8	94.736	53	152.157	122	152.777	191	152.622		
0.2583	8.89	5	97.144	54	151.77	123	152.777	192	152.7		
0.2666	8.812	5.2	99.242	55	152.235	124	152.622	193	152.855		
0.275	9.28	5.4	101.261	56	152.157	125	152.932	194	152.7		
0.2833	9.903	5.6	103.436	57	151.77	126	152.855	195	152.855		
0.2916	10.605	5.8	104.911	58	152.235	127	153.087	196	152.622		
0.3	10.137	6	106.853	59	152.002	128	152.7	197	152.545		
0.3083	10.371	6.2	108.406	60	152.157	129	153.242	198	152.777		
0.3166	10.917	6.4	110.269	61	152.002	130	153.242	199	152.777		
0.325	11.307	6.6	111.667	62	152.39	131	153.087	200	152.777		
0.3333	11.463	6.8	113.219	63	152.312	132	152.855	201	152.932		
0.35	12.008	7	114.849	64	152.39	133	153.087	202	152.855		
0.3666	12.398	7.2	115.781	65	152.157	134	153.087	203	152.932		
0.3833	13.022	7.4	117.721	66	152.39	135	153.087	204	152.622		
0.4	12.71	7.6	118.808	67	152.312	136	153.242	205	152.855		
0.4166	14.191	7.8	120.05	68	152.467	137	153.397	206	153.242		
0.4333	13.957	8	121.214	69	152.157	138	153.32	207	152.932		
0.45	14.503	8.2	122.3	70	152.235	139	152.932	208	152.932		
0.4666	15.672	8.4	123.464	71	152.39	140	153.01	209	152.7		
0.4833	15.984	8.6	124.24	72	152.235	141	153.32	210	152.855		
0.5	16.14	8.8	125.249	73	152.622	142	153.32	211	153.01		
0.5166	16.53	9	126.413	74	152.467	143	152.932	212	153.32		
0.5333	17.933	9.2	127.266	75	152.777	144	152.932	213	153.475		
0.55	17.777	9.4	128.352	76	152.467	145	153.01	214	153.242		
0.5666	17.621	9.6	129.128	77	152.39	146	153.242	215	153.01		
0.5833	18.946	9.8	129.981	78	152.312	147	153.165	216	153.165		
0.6	18.868	10	130.679	79	152.39	148	153.32	217	153.242		
0.6166	19.335	11	134.48	80	152.7	149	153.242	218	153.165		
0.6333	20.193	12	137.117	81	152.39	150	152.932	219	152.855		
0.65	20.972	13	139.443	82	152.7	151	153.165	220	153.165		
0.6666	21.44	14	141.615	83	152.622	152	153.165	221	153.01		
0.6833	22.141	15	143.01	84	152.622	153	153.01	222	153.01		
0.7	22.219	16	144.716	85	152.855	154	153.01	223	152.932		
0.7166	22.219	17	145.259	86	152.467	155	152.777	224	153.242		
0.7333	23.232	18	146.266	87	152.622	156	152.932	225	153.087		
0.75	23.699	19	147.119	88	152.7	157	152.777	226	152.932		
0.7666	24.089	20	147.972	89	152.39	158	152.855	227	153.165		
0.7833	25.18	21	148.824	90	152.7	159	152.622	228	152.855		
0.8	25.18	22	149.212	91	152.622	160	152.777	229	152.855		
0.8166	25.881	23	149.445	92	152.545	161	153.087	230	152.932		

POMPANO BEACH
IW-1
1,731 - 1,747
RECOVERY DATA

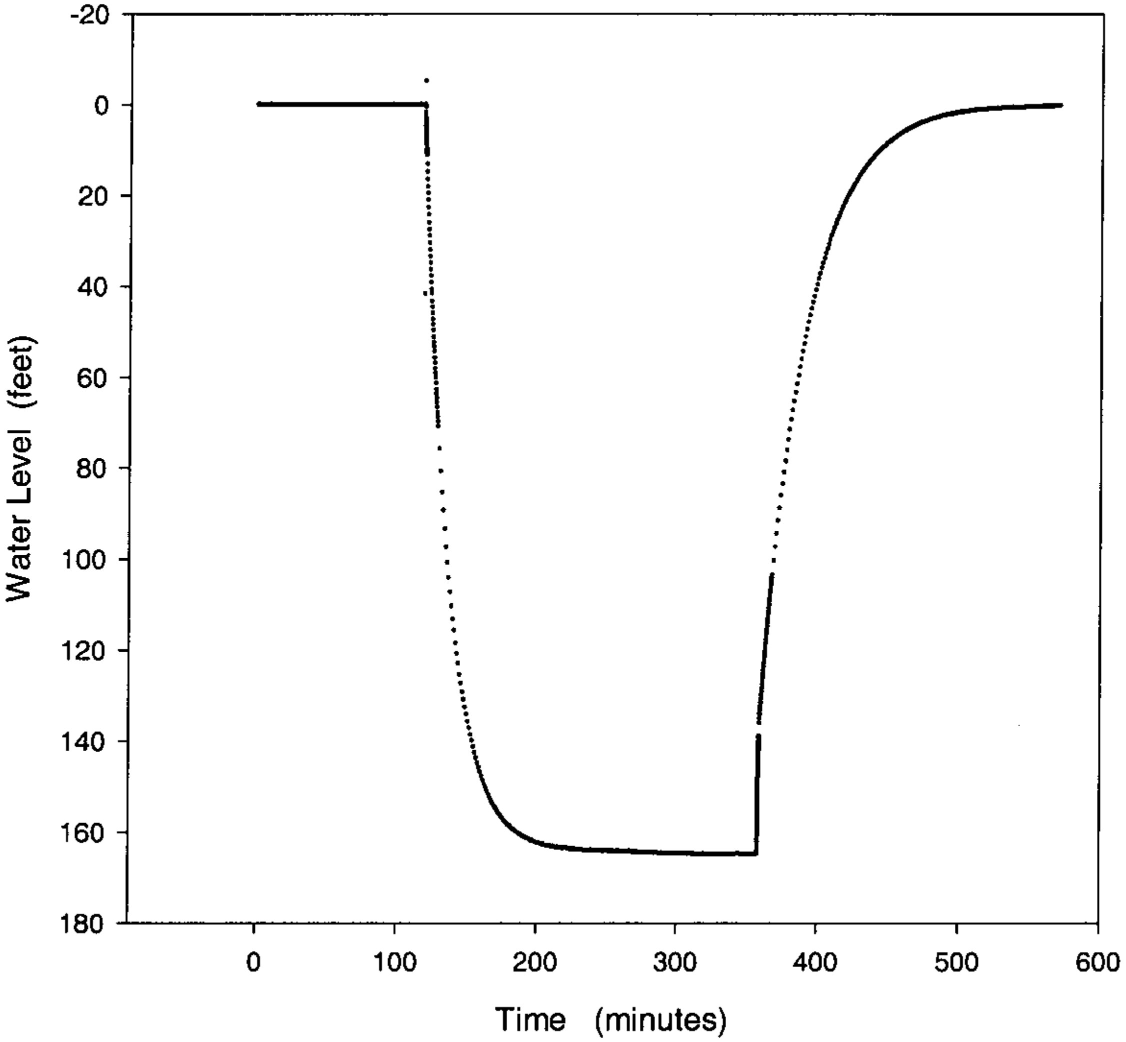
Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	152.777	0.8166	117.178	23	10.215	92	0.935	161	0.467
0.0083	150.685	0.8333	117.023	24	9.28	93	0.935	162	0.467
0.0166	150.84	0.85	116.712	25	8.5	94	0.935	163	0.467
0.025	151.46	0.8666	116.402	26	7.798	95	0.857	164	0.467
0.0333	150.84	0.8833	116.169	27	7.174	96	0.857	165	0.467
0.0416	150.297	0.9	115.936	28	6.551	97	0.857	166	0.467
0.05	149.522	0.9166	115.703	29	6.083	98	0.857	167	0.311
0.0583	149.057	0.9333	115.47	30	5.615	99	0.857	168	0.467
0.0666	148.049	0.95	115.315	31	5.225	100	0.779	169	0.545
0.075	147.429	0.9666	115.082	32	4.835	101	0.857	170	0.389
0.0833	146.731	0.9833	114.772	33	4.523	102	0.857	171	0.467
0.0916	146.421	1	114.539	34	4.289	103	0.857	172	0.467
0.1	145.724	1.2	111.822	35	3.977	104	0.779	173	0.467
0.1083	145.104	1.4	109.104	36	3.743	105	0.779	174	0.467
0.1166	144.483	1.6	106.542	37	3.587	106	0.779	175	0.389
0.125	144.251	1.8	104.057	38	3.353	107	0.779	176	0.311
0.1333	143.32	2	101.65	39	3.197	108	0.779	177	0.311
0.1416	142.855	2.2	99.242	40	3.041	109	0.701	178	0.467
0.15	142.39	2.4	96.989	41	2.807	110	0.701	179	0.389
0.1583	141.692	2.6	94.736	42	2.729	111	0.779		
0.1666	141.149	2.8	92.561	43	2.651	112	0.701		
0.175	140.607	3	90.385	44	2.495	113	0.701		
0.1833	140.374	3.2	88.287	45	2.417	114	0.701		
0.1916	139.986	3.4	86.189	46	2.339	115	0.701		
0.2	139.443	3.6	84.168	47	2.261	116	0.701		
0.2083	138.978	3.8	82.225	48	2.183	117	0.701		
0.2166	138.125	4	80.359	49	2.027	118	0.701		
0.225	137.97	4.2	78.416	50	2.027	119	0.701		
0.2333	137.427	4.4	76.55	51	1.949	120	0.701		
0.2416	137.195	4.6	74.839	52	1.871	121	0.623		
0.25	136.497	4.8	73.051	53	1.871	122	0.623		
0.2583	135.721	5	71.34	54	1.793	123	0.623		
0.2666	135.256	5.2	69.707	55	1.793	124	0.623		
0.275	135.101	5.4	68.074	56	1.715	125	0.701		
0.2833	134.79	5.6	66.518	57	1.715	126	0.623		
0.2916	134.247	5.8	64.962	58	1.559	127	0.623		
0.3	134.247	6	63.484	59	1.559	128	0.623		
0.3083	133.705	6.2	62.006	60	1.559	129	0.623		
0.3166	133.162	6.4	60.528	61	1.481	130	0.545		
0.325	133.006	6.6	59.128	62	1.481	131	0.545		
0.3333	132.619	6.8	57.805	63	1.481	132	0.545		
0.35	131.765	7	56.482	64	1.481	133	0.623		
0.3666	130.99	7.2	55.159	65	1.403	134	0.623		
0.3833	129.981	7.4	53.914	66	1.403	135	0.545		
0.4	129.361	7.6	52.669	67	1.403	136	0.545		
0.4166	128.585	7.8	51.424	68	1.325	137	0.545		
0.4333	127.887	8	50.256	69	1.325	138	0.545		
0.45	127.111	8.2	49.166	70	1.247	139	0.545		
0.4666	126.257	8.4	47.999	71	1.247	140	0.467		
0.4833	125.404	8.6	46.909	72	1.247	141	0.545		
0.5	124.706	8.8	45.819	73	1.247	142	0.545		
0.5166	124.395	9	44.807	74	1.247	143	0.545		
0.5333	123.852	9.2	43.795	75	1.169	144	0.467		
0.55	122.999	9.4	42.783	76	1.169	145	0.545		
0.5666	122.611	9.6	41.848	77	1.169	146	0.467		
0.5833	122.223	9.8	40.836	78	1.169	147	0.467		
0.6	121.602	10	39.98	79	1.091	148	0.467		
0.6166	120.903	11	35.619	80	1.091	149	0.467		
0.6333	120.593	12	31.88	81	1.091	150	0.467		
0.65	120.282	13	28.53	82	1.091	151	0.467		
0.6666	119.817	14	25.569	83	1.091	152	0.467		
0.6833	119.274	15	22.92	84	1.013	153	0.467		
0.7	118.808	16	20.582	85	1.013	154	0.467		
0.7166	118.808	17	18.556	86	1.013	155	0.467		
0.7333	118.497	18	16.685	87	1.013	156	0.623		
0.75	118.265	19	15.049	88	1.013	157	0.545		
0.7666	117.954	20	13.567	89	1.013	158	0.545		
0.7833	117.644	21	12.32	90	0.935	159	0.467		
0.8	117.411	22	11.229	91	0.935	160	0.467		

Appendix H

Straddle Packer Test No. 3 @ IW-1

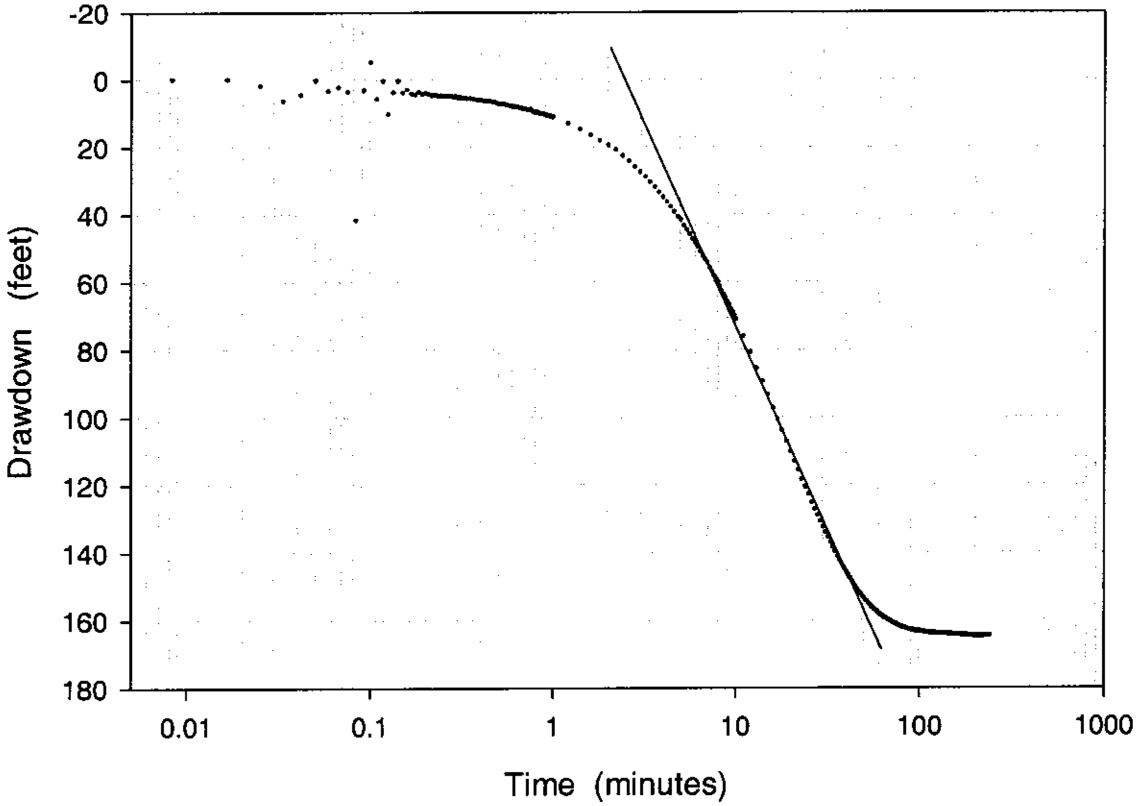
1,931 - 1,947

POMPANO BEACH
IW-1
1,931 - 1,947
BACKGROUNG. DRAWDOWN AND RECOVERY DATA



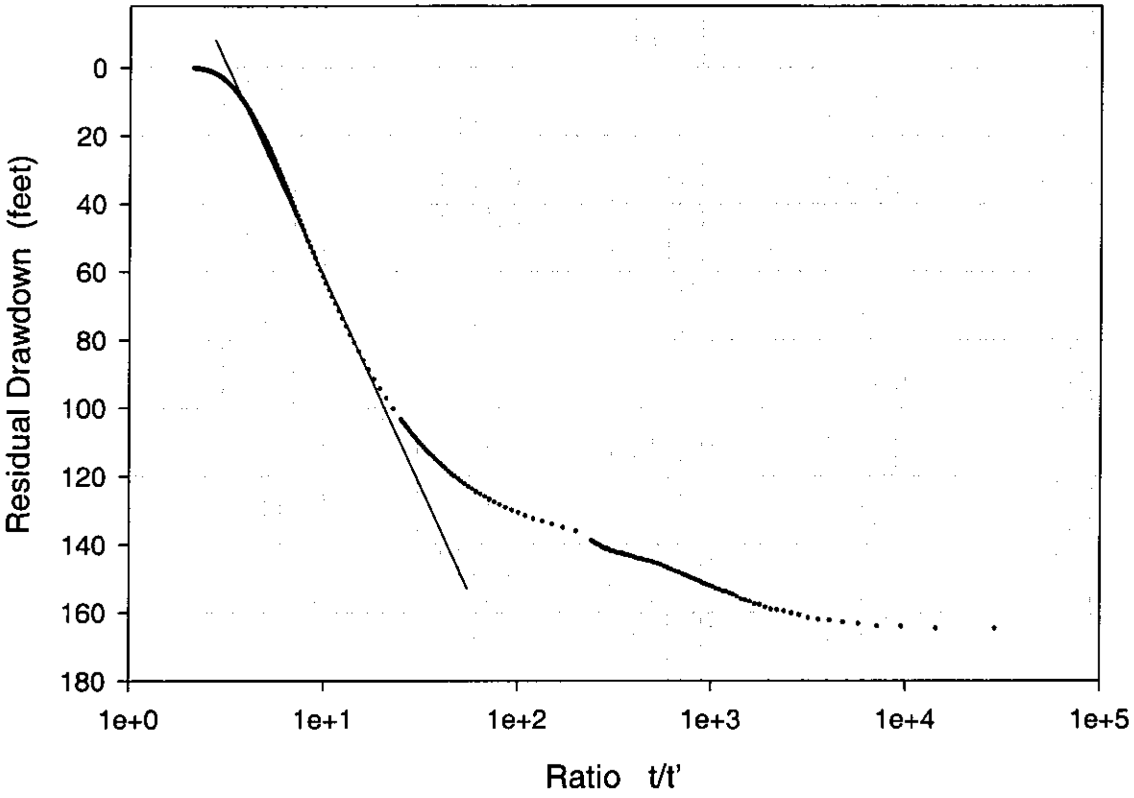
POMPANO BEACH
IW-1
1931 - 1947

DRAWDOWN



POMPANO BEACH
IW-1
1,931 - 1,947

RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1,931 - 1,947
BACKGROUND DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.077	0.8166	-0.077	23	0	92	0
0.0083	-0.077	0.8333	-0.077	24	0	93	0
0.0166	-0.077	0.85	-0.077	25	0	94	-0.077
0.025	-0.077	0.8666	-0.077	26	0.077	95	0
0.0333	-0.077	0.8833	-0.077	27	0	96	-0.155
0.0416	-0.077	0.9	-0.077	28	0	97	-0.077
0.05	-0.077	0.9166	-0.077	29	0	98	0
0.0583	-0.077	0.9333	-0.077	30	-0.077	99	-0.077
0.0666	-0.077	0.95	-0.077	31	-0.077	100	-0.077
0.075	-0.077	0.9666	-0.077	32	-0.077	101	0
0.0833	-0.077	0.9833	-0.077	33	0	102	0
0.0916	-0.077	1	-0.077	34	0	103	-0.077
0.1	-0.077	1.2	-0.155	35	0	104	-0.077
0.1083	-0.077	1.4	-0.077	36	-0.077	105	-0.077
0.1166	-0.077	1.6	-0.077	37	0	106	-0.077
0.125	-0.077	1.8	-0.077	38	0	107	-0.077
0.1333	-0.077	2	-0.077	39	0	108	-0.077
0.1416	-0.077	2.2	-0.077	40	0	109	-0.077
0.15	-0.077	2.4	-0.077	41	-0.077	110	-0.077
0.1583	-0.077	2.6	-0.077	42	0	111	0
0.1666	-0.077	2.8	-0.077	43	0	112	-0.077
0.175	-0.077	3	-0.077	44	0	113	-0.077
0.1833	-0.077	3.2	-0.077	45	-0.077	114	-0.077
0.1916	-0.077	3.4	-0.077	46	-0.077	115	-0.077
0.2	-0.155	3.6	-0.077	47	0	116	-0.077
0.2083	-0.077	3.8	-0.077	48	0	117	-0.077
0.2166	-0.077	4	0	49	-0.077	118	-0.077
0.225	-0.077	4.2	-0.077	50	0	119	-0.077
0.2333	-0.077	4.4	-0.077	51	0		
0.2416	-0.077	4.6	-0.077	52	0		
0.25	-0.077	4.8	-0.077	53	0		
0.2583	-0.077	5	-0.077	54	-0.077		
0.2666	-0.077	5.2	-0.077	55	0		
0.275	-0.077	5.4	-0.077	56	0		
0.2833	-0.077	5.6	-0.077	57	-0.077		
0.2916	-0.077	5.8	-0.077	58	0		
0.3	-0.077	6	-0.077	59	-0.077		
0.3083	-0.077	6.2	-0.077	60	-0.077		
0.3166	-0.077	6.4	-0.077	61	0		
0.325	-0.077	6.6	-0.077	62	-0.077		
0.3333	-0.077	6.8	-0.077	63	-0.077		
0.35	-0.077	7	-0.077	64	0		
0.3666	-0.077	7.2	-0.077	65	0		
0.3833	-0.077	7.4	-0.077	66	-0.077		
0.4	-0.077	7.6	-0.077	67	0		
0.4166	-0.077	7.8	-0.077	68	0		
0.4333	-0.077	8	-0.077	69	-0.077		
0.45	-0.077	8.2	-0.077	70	-0.077		
0.4666	-0.077	8.4	-0.077	71	0		
0.4833	-0.077	8.6	-0.077	72	-0.077		
0.5	-0.077	8.8	-0.155	73	0		
0.5166	-0.077	9	-0.077	74	-0.077		
0.5333	-0.077	9.2	-0.077	75	-0.077		
0.55	-0.077	9.4	-0.077	76	-0.077		
0.5666	0	9.6	-0.077	77	-0.077		
0.5833	-0.077	9.8	-0.077	78	-0.077		
0.6	-0.077	10	-0.077	79	0		
0.6166	-0.077	11	-0.077	80	-0.077		
0.6333	-0.077	12	-0.077	81	-0.077		
0.65	-0.077	13	0	82	0		
0.6666	-0.077	14	0	83	0		
0.6833	-0.077	15	0	84	-0.077		
0.7	-0.077	16	0	85	0		
0.7166	-0.077	17	0	86	-0.077		
0.7333	-0.077	18	-0.077	87	0		
0.75	-0.077	19	-0.077	88	0		
0.7666	-0.077	20	0	89	-0.077		
0.7833	-0.077	21	0	90	-0.077		
0.8	-0.077	22	0	91	-0.077		

POMPANO BEACH
IW-1
1,931 - 1,947
DRAWDOWN DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.155	0.8166	9.591	23	118.41	92	163.069	161	164.385	230	164.773
0.0083	-0.155	0.8333	9.825	24	120.738	93	162.991	162	164.463	231	164.773
0.0166	-0.155	0.85	10.058	25	122.911	94	163.146	163	164.308	232	164.773
0.025	1.637	0.8666	9.902	26	125.316	95	163.301	164	164.385	233	164.773
0.0333	6.238	0.8833	10.058	27	127.255	96	163.224	165	164.463	234	164.773
0.0416	4.445	0.9	10.37	28	129.117	97	163.301	166	164.463	235	164.773
0.05	0.233	0.9166	10.37	29	130.823	98	163.301	167	164.385	236	164.773
0.0583	3.275	0.9333	10.682	30	132.452	99	163.301	168	164.463	237	164.773
0.0666	2.183	0.95	10.526	31	134.081	100	163.456	169	164.54	238	164.773
0.075	3.587	0.9666	10.838	32	135.632	101	163.379	170	164.54	239	164.618
0.0833	41.611	0.9833	10.994	33	137.105	102	163.379	171	164.463		
0.0916	3.041	1	10.994	34	138.579	103	163.379	172	164.54		
0.1	-5.304	1.2	12.943	35	139.819	104	163.611	173	164.54		
0.1083	5.614	1.4	14.658	36	141.215	105	163.611	174	164.618		
0.1166	0.389	1.6	16.294	37	142.455	106	163.611	175	164.54		
0.125	10.136	1.8	17.931	38	143.618	107	163.688	176	164.618		
0.1333	3.665	2	19.412	39	144.781	108	163.611	177	164.618		
0.1416	0.389	2.2	20.814	40	145.789	109	163.688	178	164.54		
0.15	3.743	2.4	22.529	41	146.719	110	163.611	179	164.618		
0.1583	2.885	2.6	24.087	42	147.649	111	163.766	180	164.54		
0.1666	4.055	2.8	25.879	43	148.579	112	163.843	181	164.463		
0.175	4.289	3	27.359	44	149.509	113	163.766	182	164.54		
0.1833	3.665	3.2	28.761	45	150.207	114	163.843	183	164.618		
0.1916	4.211	3.4	30.319	46	150.982	115	163.843	184	164.695		
0.2	3.977	3.6	31.877	47	151.679	116	163.921	185	164.618		
0.2083	4.211	3.8	33.357	48	152.377	117	163.921	186	164.695		
0.2166	4.679	4	34.759	49	153.074	118	163.998	187	164.695		
0.225	4.445	4.2	36.238	50	153.617	119	163.998	188	164.695		
0.2333	4.757	4.4	37.64	51	154.237	120	163.843	189	164.695		
0.2416	4.679	4.6	39.042	52	154.624	121	163.843	190	164.695		
0.25	4.835	4.8	40.599	53	155.166	122	163.998	191	164.618		
0.2583	4.835	5	41.533	54	155.709	123	163.921	192	164.695		
0.2666	4.835	5.2	43.246	55	156.174	124	163.998	193	164.695		
0.275	4.835	5.4	44.492	56	156.561	125	163.998	194	164.695		
0.2833	5.068	5.6	45.815	57	157.026	126	163.998	195	164.773		
0.2916	4.835	5.8	47.216	58	157.336	127	163.921	196	164.773		
0.3	5.224	6	48.384	59	157.723	128	163.998	197	164.85		
0.3083	5.224	6.2	49.551	60	158.111	129	164.076	198	164.85		
0.3166	5.38	6.4	51.108	61	158.343	130	163.921	199	164.85		
0.325	5.38	6.6	52.353	62	158.576	131	163.921	200	164.695		
0.3333	5.536	6.8	53.287	63	158.885	132	163.998	201	164.695		
0.35	5.536	7	54.299	64	159.273	133	164.076	202	164.85		
0.3666	5.614	7.2	55.699	65	159.428	134	164.076	203	164.773		
0.3833	5.926	7.4	56.866	66	159.583	135	163.998	204	164.85		
0.4	5.926	7.6	58.111	67	159.815	136	164.076	205	164.85		
0.4166	6.238	7.8	59.123	68	160.125	137	164.076	206	164.85		
0.4333	6.238	8	60.056	69	160.28	138	164.153	207	164.85		
0.45	6.316	8.2	61.301	70	160.435	139	164.076	208	164.773		
0.4666	6.55	8.4	62.701	71	160.667	140	163.998	209	164.85		
0.4833	6.706	8.6	63.635	72	160.9	141	164.153	210	164.773		
0.5	7.096	8.8	64.646	73	160.977	142	164.153	211	164.85		
0.5166	7.096	9	65.657	74	161.132	143	164.153	212	164.85		
0.5333	7.252	9.2	66.668	75	161.287	144	164.231	213	164.85		
0.55	7.33	9.4	67.835	76	161.442	145	164.231	214	164.85		
0.5666	7.564	9.6	68.846	77	161.752	146	164.076	215	164.773		
0.5833	7.72	9.8	69.857	78	161.674	147	164.076	216	164.773		
0.6	7.953	10	70.867	79	161.907	148	164.076	217	164.85		
0.6166	7.875	11	75.844	80	162.062	149	164.231	218	164.773		
0.6333	8.031	12	80.663	81	162.139	150	164.308	219	164.85		
0.65	8.187	13	85.327	82	162.294	151	164.308	220	164.773		
0.6666	8.265	14	89.29	83	162.294	152	164.308	221	164.773		
0.6833	8.577	15	93.252	84	162.449	153	164.308	222	164.773		
0.7	8.577	16	97.292	85	162.604	154	164.308	223	164.773		
0.7166	8.811	17	100.709	86	162.526	155	164.385	224	164.695		
0.7333	8.811	18	104.048	87	162.759	156	164.385	225	164.618		
0.75	8.733	19	107.154	88	162.836	157	164.385	226	164.695		
0.7666	9.279	20	110.26	89	162.914	158	164.385	227	164.773		
0.7833	9.513	21	113.132	90	162.836	159	164.385	228	164.773		
0.8	9.591	22	115.616	91	162.991	160	164.385	229	164.773		

POMPANO BEACH
IW-1
1,931 - 1,947
RECOVERY DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	164.618	0.8166	141.292	23	69.312	92	7.875	161	0.701
0.0083	164.618	0.8333	140.982	24	67.29	93	7.642	162	0.779
0.0166	164.618	0.85	141.137	25	65.268	94	7.408	163	0.779
0.025	164.076	0.8666	140.905	26	63.246	95	7.174	164	0.779
0.0333	163.998	0.8833	140.517	27	61.379	96	6.94	165	0.701
0.0416	163.224	0.9	140.129	28	59.512	97	6.706	166	0.701
0.05	162.759	0.9166	139.897	29	57.722	98	6.472	167	0.623
0.0583	162.217	0.9333	139.974	30	55.933	99	6.316	168	0.623
0.0666	162.062	0.95	139.509	31	54.221	100	6.082	169	0.623
0.075	161.519	0.9666	139.277	32	52.586	101	5.848	170	0.623
0.0833	160.745	0.9833	139.044	33	50.952	102	5.692	171	0.545
0.0916	160.125	1	138.811	34	49.396	103	5.536	172	0.545
0.1	159.505	1.2	136.02	35	47.839	104	5.302	173	0.545
0.1083	159.118	1.4	134.934	36	46.36	105	5.146	174	0.545
0.1166	158.963	1.6	134.003	37	44.881	106	4.99	175	0.545
0.125	158.343	1.8	133.15	38	43.48	107	4.835	176	0.467
0.1333	157.568	2	132.375	39	42.156	108	4.679	177	0.467
0.1416	157.413	2.2	131.522	40	40.833	109	4.523	178	0.467
0.15	156.639	2.4	130.668	41	39.509	110	4.367	179	0.467
0.1583	156.329	2.6	129.893	42	38.263	111	4.211	180	0.467
0.1666	156.019	2.8	129.117	43	37.095	112	4.055	181	0.389
0.175	155.244	3	128.341	44	35.927	113	3.977	182	0.389
0.1833	154.624	3.2	127.488	45	34.837	114	3.821	183	0.389
0.1916	154.237	3.4	126.712	46	33.746	115	3.665	184	0.389
0.2	153.772	3.6	125.936	47	32.656	116	3.587	185	0.389
0.2083	153.694	3.8	125.161	48	31.643	117	3.509	186	0.389
0.2166	153.152	4	124.462	49	30.631	118	3.353	187	0.311
0.225	152.997	4.2	123.686	50	29.618	119	3.275	188	0.311
0.2333	152.377	4.4	122.911	51	28.683	120	3.119	189	0.311
0.2416	152.067	4.6	122.135	52	27.827	121	3.041	190	0.311
0.25	151.757	4.8	121.436	53	26.892	122	2.885	191	0.233
0.2583	151.524	5	120.66	54	26.113	123	2.885	192	0.233
0.2666	150.982	5.2	119.884	55	25.256	124	2.729	193	0.311
0.275	150.672	5.4	119.186	56	24.477	125	2.651	194	0.233
0.2833	150.362	5.6	118.487	57	23.62	126	2.573	195	0.233
0.2916	150.052	5.8	117.711	58	22.918	127	2.495	196	0.233
0.3	149.819	6	117.013	59	22.217	128	2.417	197	0.311
0.3083	149.509	6.2	116.314	60	21.516	129	2.261	198	0.233
0.3166	149.199	6.4	115.616	61	20.892	130	2.183	199	0.233
0.325	148.967	6.6	114.84	62	20.269	131	2.183	200	0.233
0.3333	148.657	6.8	114.141	63	19.723	132	2.027	201	0.155
0.35	148.114	7	113.52	64	19.1	133	2.027	202	0.155
0.3666	147.727	7.2	112.821	65	18.554	134	1.949	203	0.233
0.3833	147.184	7.4	112.123	66	17.931	135	1.949	204	0.155
0.4	146.797	7.6	111.424	67	17.385	136	1.871	205	0.155
0.4166	146.409	7.8	110.726	68	16.918	137	1.793	206	0.233
0.4333	145.866	8	110.104	69	16.372	138	1.715	207	0.155
0.45	145.556	8.2	109.328	70	15.827	139	1.637	208	0.155
0.4666	145.324	8.4	108.707	71	15.359	140	1.637	209	0.155
0.4833	145.014	8.6	108.008	72	14.891	141	1.481	210	0.155
0.5	144.781	8.8	107.31	73	14.424	142	1.481	211	0.077
0.5166	144.626	9	106.688	74	14.034	143	1.481	212	0.077
0.5333	144.394	9.2	105.99	75	13.566	144	1.403		
0.55	144.083	9.4	105.368	76	13.099	145	1.403		
0.5666	144.083	9.6	104.67	77	12.709	146	1.325		
0.5833	143.928	9.8	104.048	78	12.319	147	1.247		
0.6	143.541	10	103.427	79	11.929	148	1.247		
0.6166	143.386	11	100.321	80	11.54	149	1.169		
0.6333	143.153	12	97.214	81	11.15	150	1.169		
0.65	142.921	13	94.34	82	10.838	151	1.091		
0.6666	142.998	14	91.543	83	10.526	152	1.091		
0.6833	142.455	15	88.746	84	10.136	153	1.013		
0.7	142.61	16	86.026	85	9.825	154	1.013		
0.7166	142.378	17	83.461	86	9.513	155	0.935		
0.7333	142.455	18	80.897	87	9.279	156	0.935		
0.75	142.068	19	78.487	88	8.967	157	0.935		
0.7666	141.913	20	76.077	89	8.733	158	0.857		
0.7833	141.913	21	73.744	90	8.343	159	0.857		
0.8	141.603	22	71.489	91	8.109	160	0.857		

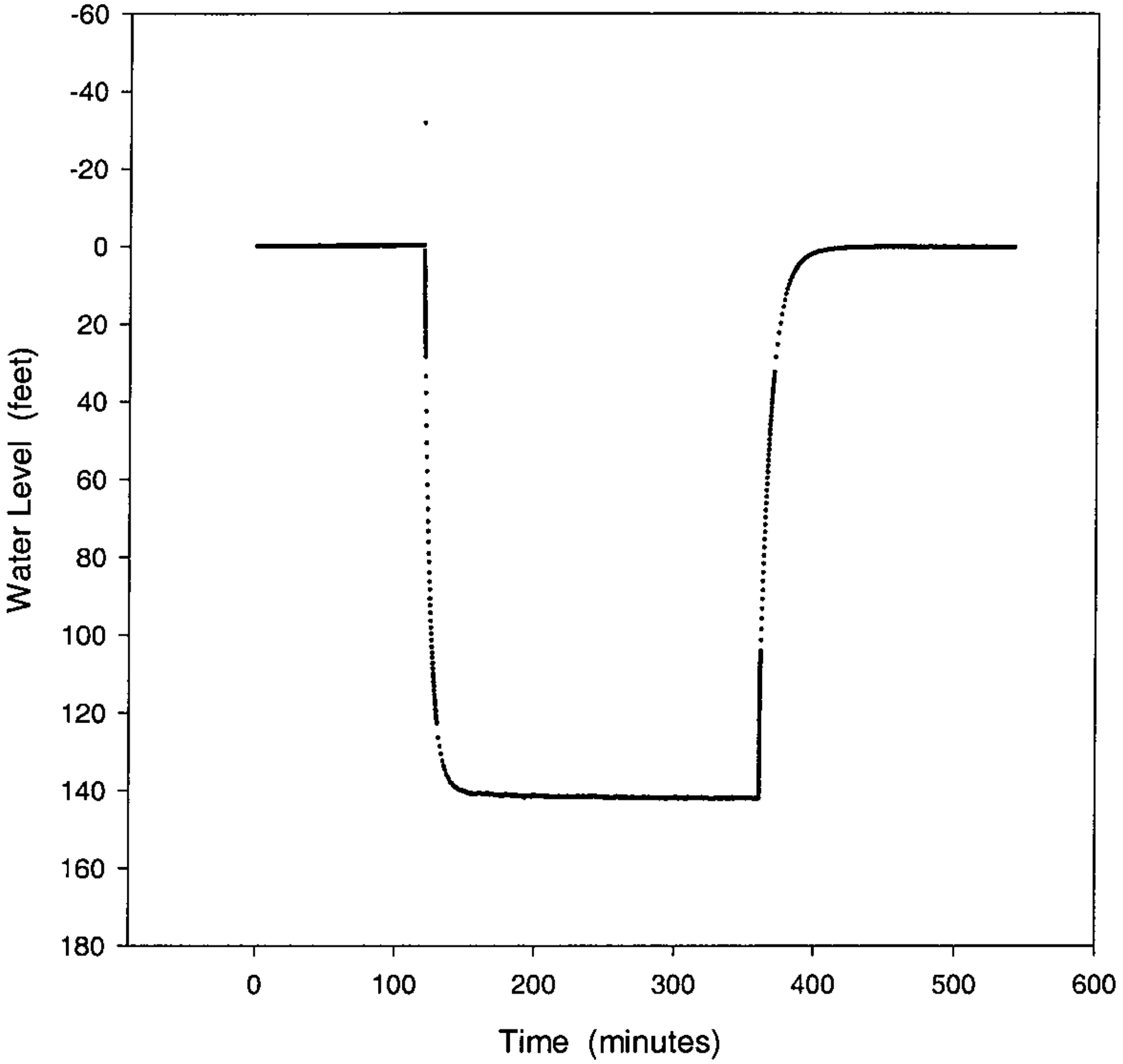
Appendix H

Straddle Packer Test No. 4 @ IW-1

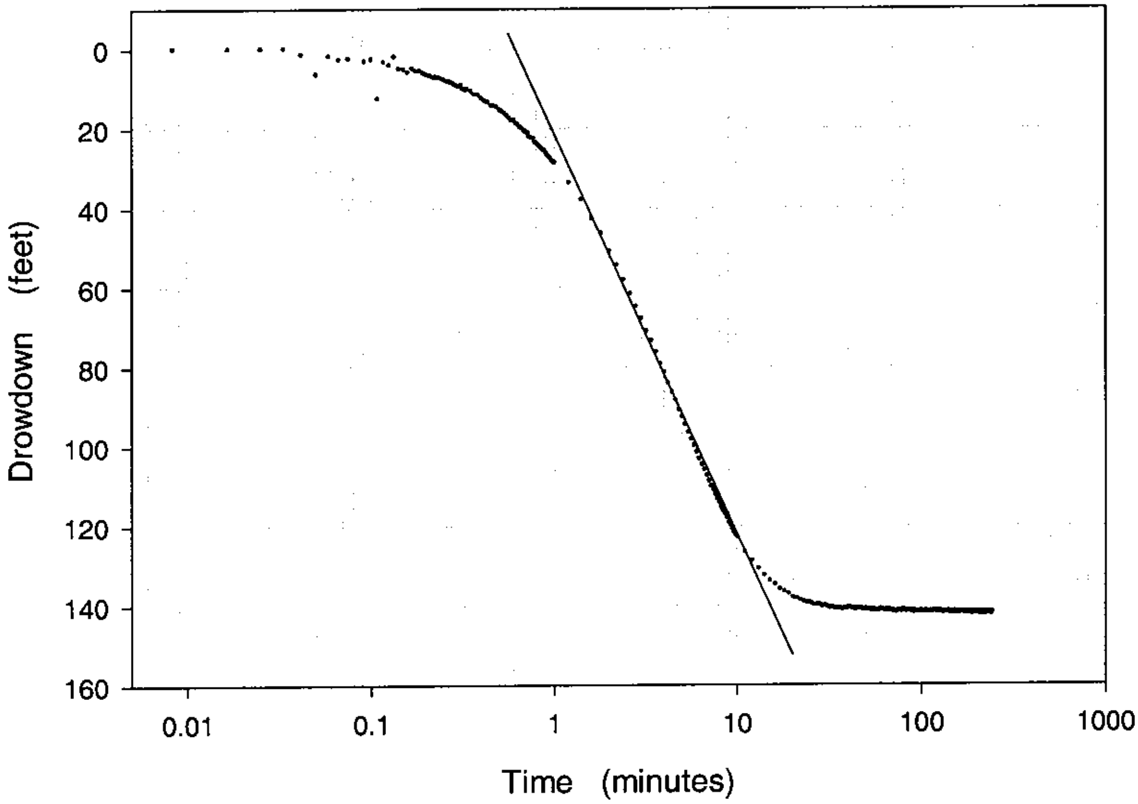
1,679 - 1,695

POMPANO BEACH
IW-1
1,679 - 1,695

BACKGROUND, DRAWDOWN AND RECOVERY DATA

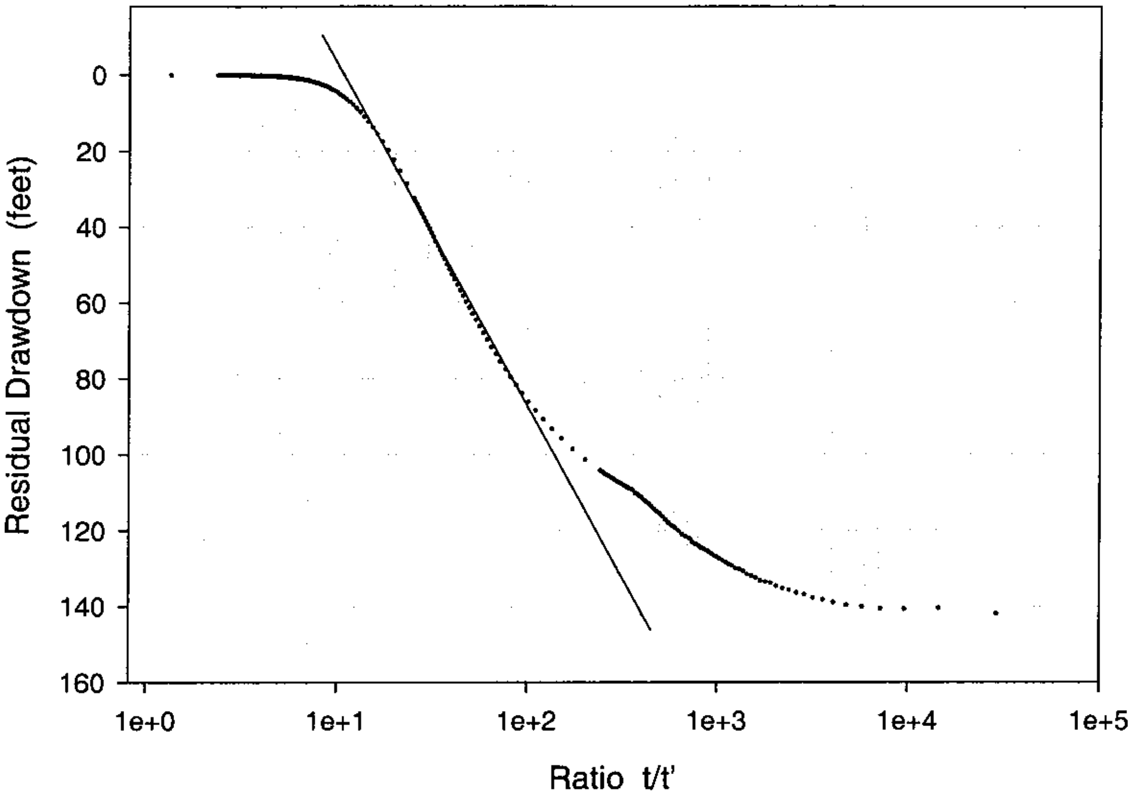


POMPANO BEACH
IW-1
1679 - 1695
DRAWDOWN



POMPANO BEACH
IW-1
1,679 - 1,695

RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1,679 - 1,695
BACKGROUND DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.077	0.8166	-0.077	23	-0.077	92	-0.155
0.0083	-0.077	0.8333	-0.077	24	-0.077	93	-0.155
0.0166	-0.077	0.85	-0.077	25	-0.077	94	-0.155
0.025	-0.077	0.8666	-0.077	26	-0.077	95	-0.155
0.0333	-0.077	0.8833	-0.077	27	-0.077	96	-0.155
0.0416	-0.077	0.9	-0.077	28	-0.077	97	-0.155
0.05	-0.077	0.9166	-0.077	29	-0.077	98	-0.233
0.0583	-0.077	0.9333	-0.077	30	-0.077	99	-0.155
0.0666	-0.077	0.95	-0.077	31	-0.077	100	-0.233
0.075	-0.077	0.9666	-0.077	32	-0.077	101	-0.233
0.0833	-0.077	0.9833	-0.077	33	-0.077	102	-0.233
0.0916	-0.077	1	-0.077	34	-0.077	103	-0.233
0.1	-0.077	1.2	-0.077	35	-0.077	104	-0.233
0.1083	-0.077	1.4	-0.077	36	-0.077	105	-0.233
0.1166	-0.077	1.6	-0.077	37	-0.077	106	-0.233
0.125	-0.077	1.8	-0.077	38	-0.077	107	-0.233
0.1333	-0.077	2	-0.077	39	-0.077	108	-0.233
0.1416	-0.077	2.2	-0.077	40	-0.077	109	-0.233
0.15	-0.077	2.4	-0.077	41	-0.077	110	-0.233
0.1583	-0.077	2.6	-0.077	42	-0.077	111	-0.233
0.1666	-0.077	2.8	-0.077	43	-0.077	112	-0.233
0.175	-0.077	3	-0.077	44	-0.155	113	-0.233
0.1833	-0.077	3.2	-0.077	45	-0.155	114	-0.233
0.1916	-0.077	3.4	-0.077	46	-0.077	115	-0.233
0.2	-0.077	3.6	-0.077	47	-0.077	116	-0.233
0.2083	-0.077	3.8	-0.077	48	-0.077	117	-0.311
0.2166	-0.077	4	-0.077	49	-0.077	118	-0.233
0.225	-0.077	4.2	-0.077	50	-0.077	119	-0.233
0.2333	-0.077	4.4	-0.077	51	-0.077	120	-0.233
0.2416	-0.077	4.6	-0.077	52	-0.077		
0.25	-0.077	4.8	-0.077	53	-0.155		
0.2583	-0.077	5	-0.077	54	-0.077		
0.2666	-0.077	5.2	-0.077	55	-0.077		
0.275	-0.077	5.4	-0.077	56	-0.077		
0.2833	-0.077	5.6	-0.077	57	-0.155		
0.2916	-0.077	5.8	-0.077	58	-0.155		
0.3	-0.077	6	-0.077	59	-0.155		
0.3083	-0.077	6.2	-0.077	60	-0.155		
0.3166	-0.077	6.4	-0.077	61	-0.155		
0.325	-0.077	6.6	-0.077	62	-0.155		
0.3333	-0.077	6.8	-0.077	63	-0.155		
0.35	-0.077	7	-0.077	64	-0.155		
0.3666	-0.077	7.2	-0.077	65	-0.155		
0.3833	-0.077	7.4	-0.077	66	-0.155		
0.4	-0.077	7.6	-0.077	67	-0.155		
0.4166	-0.077	7.8	-0.077	68	-0.155		
0.4333	-0.077	8	-0.077	69	-0.155		
0.45	-0.077	8.2	-0.077	70	-0.155		
0.4666	-0.077	8.4	-0.077	71	-0.155		
0.4833	-0.077	8.6	-0.077	72	-0.155		
0.5	-0.077	8.8	-0.077	73	-0.155		
0.5166	-0.077	9	-0.077	74	-0.155		
0.5333	-0.077	9.2	-0.077	75	-0.155		
0.55	-0.077	9.4	-0.077	76	-0.155		
0.5666	-0.077	9.6	-0.077	77	-0.155		
0.5833	-0.077	9.8	-0.077	78	-0.155		
0.6	-0.077	10	-0.077	79	-0.155		
0.6166	-0.077	11	-0.077	80	-0.155		
0.6333	-0.077	12	0	81	-0.155		
0.65	-0.077	13	0	82	-0.155		
0.6666	-0.077	14	-0.077	83	-0.155		
0.6833	-0.077	15	-0.077	84	-0.155		
0.7	-0.077	16	-0.077	85	-0.155		
0.7166	-0.077	17	-0.077	86	-0.155		
0.7333	-0.077	18	0	87	-0.155		
0.75	-0.077	19	-0.077	88	-0.233		
0.7666	-0.077	20	-0.077	89	-0.233		
0.7833	-0.077	21	-0.077	90	-0.233		
0.8	-0.077	22	-0.077	91	-0.155		

POMPANO BEACH
IW-1
1,679 - 1,695
DRAWDOWN DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.311	0.8166	24.079	23	138.999	92	141.79	161	141.945	230	141.867
0.0083	-0.311	0.8333	24.391	24	139.31	93	141.635	162	141.79	231	141.867
0.0166	-0.311	0.85	24.78	25	139.387	94	141.712	163	141.867	232	142.1
0.025	-0.311	0.8666	25.248	26	139.93	95	141.712	164	141.867	233	141.867
0.0333	-0.311	0.8833	25.403	27	139.93	96	141.712	165	141.867	234	141.945
0.0416	1.169	0.9	26.104	28	139.93	97	141.712	166	141.867	235	141.945
0.05	6.158	0.9166	26.494	29	140.24	98	141.557	167	141.867	236	142.022
0.0583	1.637	0.9333	26.961	30	140.085	99	141.712	168	141.867	237	142.177
0.0666	2.494	0.95	27.428	31	140.395	100	141.635	169	141.867	238	142.022
0.075	2.26	0.9666	28.051	32	140.705	101	141.712	170	142.1	239	141.867
0.0833	-31.831	0.9833	28.207	33	140.627	102	141.712	171	141.867	240	142.177
0.0916	2.962	1	28.441	34	140.86	103	141.79	172	141.867	241	141.867
0.1	2.338	1.2	33.502	35	140.782	104	141.557	173	142.1		
0.1083	12.315	1.4	37.784	36	140.86	105	141.712	174	142.022		
0.1166	3.118	1.6	42.532	37	141.015	106	141.712	175	142.1		
0.125	3.898	1.8	46.267	38	140.937	107	141.635	176	142.022		
0.1333	1.793	2	50.703	39	140.86	108	141.79	177	142.022		
0.1416	4.833	2.2	54.281	40	140.705	109	141.79	178	141.945		
0.15	4.989	2.4	58.015	41	140.627	110	141.712	179	142.022		
0.1583	5.69	2.6	61.515	42	140.782	111	141.557	180	142.022		
0.1666	4.755	2.8	64.703	43	140.937	112	141.557	181	141.712		
0.175	5.379	3	67.735	44	141.015	113	141.635	182	141.79		
0.1833	5.301	3.2	70.923	45	140.86	114	141.79	183	142.1		
0.1916	5.924	3.4	73.332	46	140.782	115	141.557	184	142.022		
0.2	6.236	3.6	76.13	47	140.782	116	141.635	185	141.867		
0.2083	6.47	3.8	79.083	48	141.092	117	141.635	186	142.022		
0.2166	6.938	4	81.259	49	141.015	118	141.635	187	141.945		
0.225	6.86	4.2	84.056	50	140.937	119	141.557	188	142.177		
0.2333	7.016	4.4	86.309	51	141.092	120	141.48	189	142.177		
0.2416	7.327	4.6	88.329	52	141.092	121	141.712	190	141.79		
0.25	7.561	4.8	90.737	53	141.247	122	141.557	191	141.867		
0.2583	7.951	5	92.446	54	141.247	123	141.557	192	141.867		
0.2666	8.107	5.2	94.387	55	141.325	124	141.48	193	141.867		
0.275	8.263	5.4	96.406	56	141.247	125	141.635	194	141.867		
0.2833	8.652	5.6	98.115	57	141.402	126	141.79	195	142.022		
0.2916	9.042	5.8	99.668	58	141.402	127	141.635	196	141.867		
0.3	9.276	6	101.376	59	141.17	128	141.79	197	141.867		
0.3083	8.964	6.2	103.084	60	141.015	129	141.712	198	141.945		
0.3166	9.899	6.4	104.558	61	141.092	130	141.712	199	141.945		
0.325	10.133	6.6	105.878	62	141.17	131	141.945	200	141.79		
0.3333	9.977	6.8	107.275	63	141.325	132	141.79	201	142.1		
0.35	10.523	7	108.672	64	141.402	133	141.79	202	141.867		
0.3666	11.302	7.2	109.992	65	141.17	134	141.867	203	142.022		
0.3833	11.38	7.4	110.923	66	141.402	135	141.867	204	141.945		
0.4	12.159	7.6	112.087	67	141.17	136	141.867	205	142.1		
0.4166	12.939	7.8	113.251	68	141.402	137	141.867	206	142.1		
0.4333	13.25	8	114.337	69	141.48	138	141.867	207	142.177		
0.45	14.03	8.2	115.501	70	141.402	139	141.557	208	142.177		
0.4666	14.185	8.4	116.355	71	141.557	140	141.712	209	142.1		
0.4833	14.419	8.6	117.053	72	141.557	141	141.712	210	141.945		
0.5	15.12	8.8	117.984	73	141.867	142	141.945	211	141.945		
0.5166	15.51	9	119.148	74	141.48	143	141.79	212	142.1		
0.5333	15.978	9.2	119.768	75	141.48	144	141.945	213	141.867		
0.55	16.601	9.4	120.777	76	141.402	145	141.79	214	142.177		
0.5666	17.224	9.6	121.553	77	141.402	146	141.79	215	141.945		
0.5833	17.847	9.8	122.251	78	141.635	147	141.945	216	142.022		
0.6	17.692	10	122.716	79	141.247	148	142.022	217	142.022		
0.6166	18.471	11	126.439	80	141.247	149	141.945	218	142.255		
0.6333	18.938	12	128.688	81	141.402	150	141.79	219	141.945		
0.65	19.483	13	130.704	82	141.557	151	141.635	220	142.177		
0.6666	19.795	14	132.41	83	141.557	152	141.945	221	142.022		
0.6833	20.496	15	133.728	84	141.402	153	141.867	222	141.79		
0.7	20.652	16	134.736	85	141.325	154	142.022	223	142.177		
0.7166	20.964	17	135.821	86	141.325	155	141.867	224	142.022		
0.7333	21.976	18	136.519	87	141.48	156	141.945	225	141.945		
0.75	22.21	19	137.062	88	141.712	157	141.945	226	141.867		
0.7666	22.288	20	137.914	89	141.557	158	141.79	227	141.945		
0.7833	23.223	21	138.147	90	141.48	159	141.712	228	142.022		
0.8	23.534	22	138.689	91	141.712	160	141.867	229	141.945		

POMPANO BEACH
IW-1
1,679 -1,695
RECOVERY DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	141.945	0.8166	106.965	23	7.093	92	0.155	161	0.155
0.0083	142.022	0.8333	106.654	24	6.392	93	0.233	162	0.155
0.0166	140.55	0.85	106.421	25	5.768	94	0.233	163	0.155
0.025	140.705	0.8666	106.111	26	5.223	95	0.233	164	0.155
0.0333	140.55	0.8833	105.878	27	4.677	96	0.233	165	0.155
0.0416	140.085	0.9	105.645	28	4.209	97	0.155	166	0.155
0.05	139.62	0.9166	105.412	29	3.82	98	0.155	167	0.155
0.0583	138.922	0.9333	105.179	30	3.508	99	0.155	168	0.155
0.0666	138.147	0.95	104.947	31	3.118	100	0.155	169	0.155
0.075	137.759	0.9666	104.636	32	2.884	101	0.155	170	0.077
0.0833	136.829	0.9833	104.403	33	2.65	102	0.155	171	0.155
0.0916	136.364	1	104.17	34	2.416	103	0.155	172	0.155
0.1	135.589	1.2	101.376	35	2.26	104	0.155	173	0.155
0.1083	135.279	1.4	98.58	36	2.105	105	0.155	174	0.155
0.1166	134.581	1.6	95.863	37	1.949	106	0.155	175	0.077
0.125	133.883	1.8	93.3	38	1.793	107	0.155	176	0.155
0.1333	133.65	2	90.815	39	1.637	108	0.155	177	0.155
0.1416	133.263	2.2	88.484	40	1.481	109	0.155	178	0.155
0.15	132.487	2.4	86.154	41	1.403	110	0.155	179	0.155
0.1583	131.945	2.6	83.901	42	1.325	111	0.155	180	0.077
0.1666	131.557	2.8	81.648	43	1.247	112	0.155		
0.175	130.704	3	79.55	44	1.169	113	0.155		
0.1833	130.239	3.2	77.451	45	1.091	114	0.155		
0.1916	130.006	3.4	75.431	46	1.013	115	0.155		
0.2	129.308	3.6	73.488	47	0.935	116	0.155		
0.2083	128.843	3.8	71.622	48	0.935	117	0.155		
0.2166	128.455	4	69.756	49	0.857	118	0.155		
0.225	127.912	4.2	67.968	50	0.779	119	0.155		
0.2333	127.525	4.4	66.18	51	0.779	120	0.077		
0.2416	126.982	4.6	64.47	52	0.701	121	0.155		
0.25	126.672	4.8	62.837	53	0.701	122	0.155		
0.2583	126.051	5	61.204	54	0.701	123	0.155		
0.2666	125.586	5.2	59.648	55	0.623	124	0.155		
0.275	125.198	5.4	58.093	56	0.623	125	0.155		
0.2833	124.81	5.6	56.615	57	0.623	126	0.155		
0.2916	124.578	5.8	55.137	58	0.545	127	0.155		
0.3	124.035	6	53.737	59	0.545	128	0.155		
0.3083	123.647	6.2	52.414	60	0.467	129	0.155		
0.3166	123.492	6.4	51.092	61	0.467	130	0.077		
0.325	123.026	6.6	49.769	62	0.467	131	0.155		
0.3333	122.173	6.8	48.446	63	0.467	132	0.155		
0.35	121.63	7	47.279	64	0.467	133	0.155		
0.3666	121.087	7.2	46.034	65	0.389	134	0.155		
0.3833	120.079	7.4	44.867	66	0.389	135	0.155		
0.4	119.225	7.6	43.777	67	0.389	136	0.155		
0.4166	118.682	7.8	42.61	68	0.389	137	0.155		
0.4333	117.984	8	41.598	69	0.389	138	0.155		
0.45	117.208	8.2	40.508	70	0.389	139	0.155		
0.4666	116.277	8.4	39.496	71	0.311	140	0.077		
0.4833	115.579	8.6	38.562	72	0.311	141	0.155		
0.5	114.958	8.8	37.55	73	0.311	142	0.155		
0.5166	114.337	9	36.616	74	0.311	143	0.155		
0.5333	113.639	9.2	35.76	75	0.311	144	0.155		
0.55	113.018	9.4	34.826	76	0.311	145	0.155		
0.5666	112.475	9.6	33.969	77	0.311	146	0.155		
0.5833	112.009	9.8	33.191	78	0.311	147	0.155		
0.6	111.233	10	32.412	79	0.311	148	0.155		
0.6166	110.845	11	28.519	80	0.311	149	0.155		
0.6333	110.302	12	25.248	81	0.233	150	0.077		
0.65	110.225	13	22.288	82	0.233	151	0.077		
0.6666	109.371	14	19.795	83	0.233	152	0.155		
0.6833	109.138	15	17.536	84	0.233	153	0.155		
0.7	108.905	16	15.588	85	0.233	154	0.155		
0.7166	108.595	17	13.874	86	0.233	155	0.155		
0.7333	108.284	18	12.315	87	0.233	156	0.155		
0.75	107.974	19	10.99	88	0.233	157	0.155		
0.7666	107.663	20	9.821	89	0.233	158	0.155		
0.7833	107.43	21	8.808	90	0.233	159	0.155		
0.8	107.198	22	7.873	91	0.155	160	0.077		

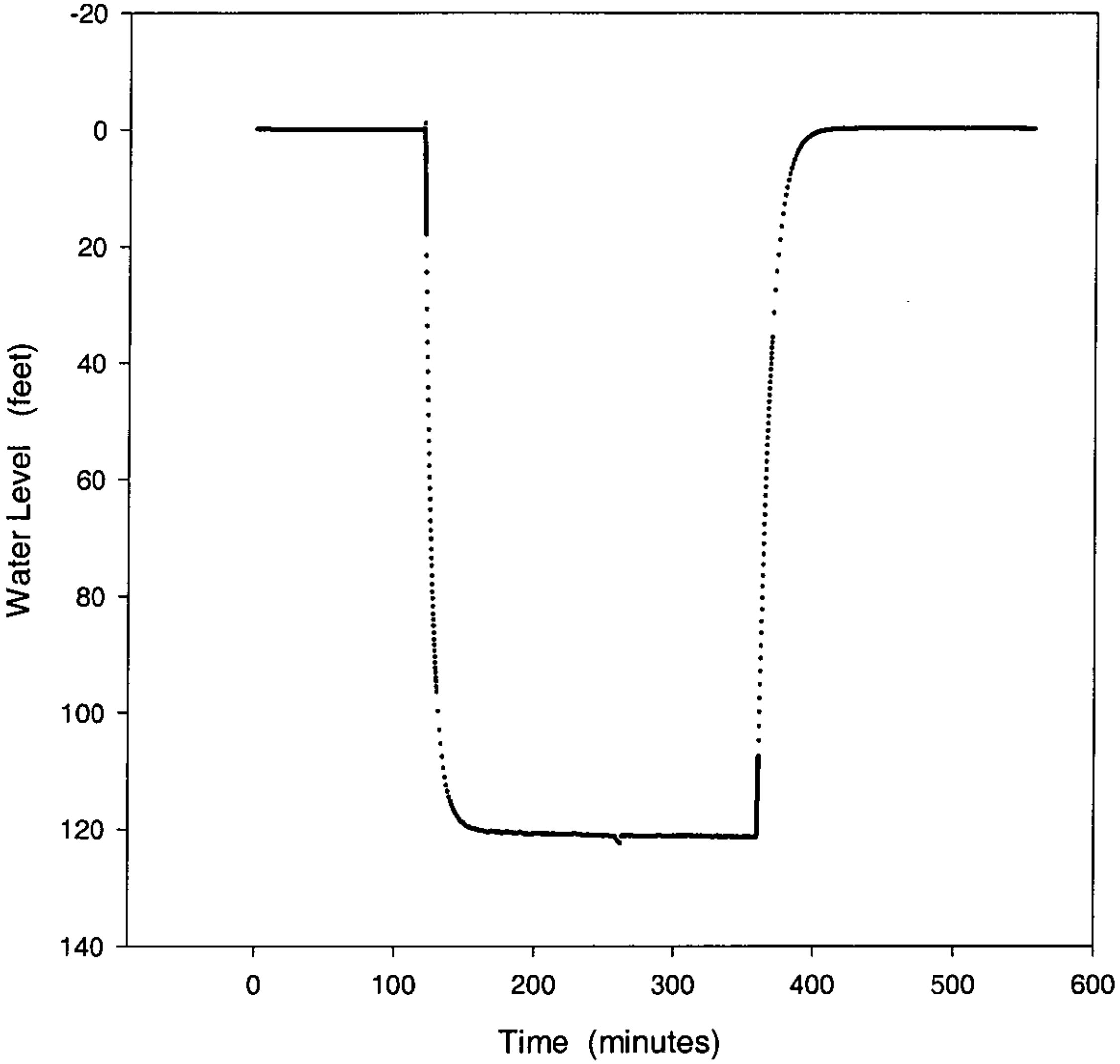
Appendix H

Straddle Packer Test No. 5 @ IW-1

1,811 - 1,827

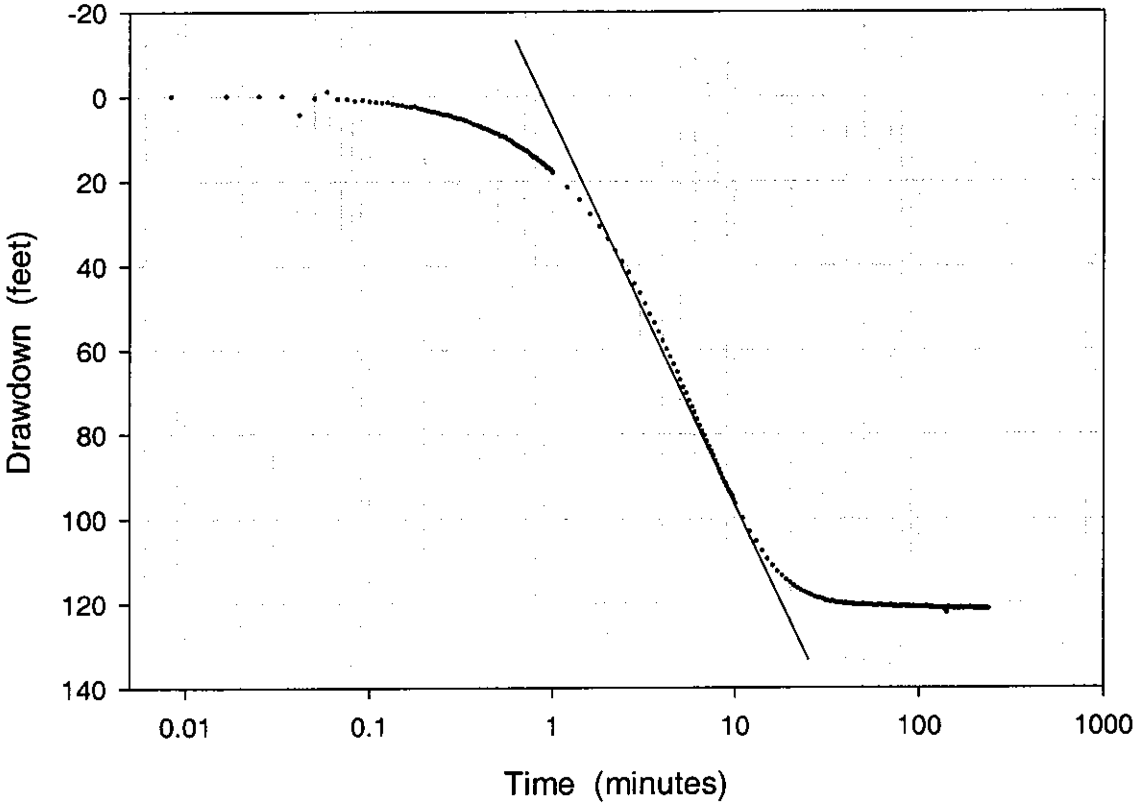
POMPANO BEACH
IW-1
1,811 - 1,827

BACKGROUND, DRAWDOWN AND RECOVERY



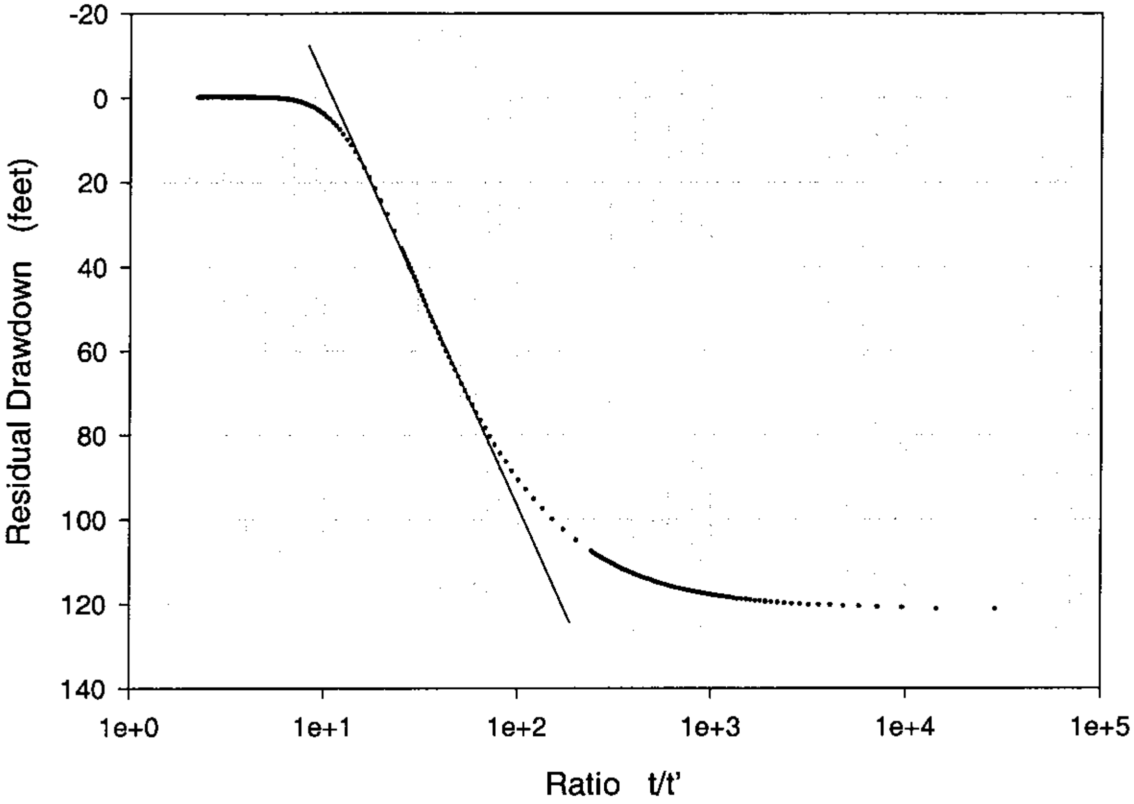
POMPANO BEACH
IW-1
1811 -1827

DRAWDOWN



POMPANO BEACH
IW-1
1,811 - 1,827

RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1811 - 1827
BACKGROUND DATA

Time (minutes)	Water Level (feet)
0	-0.077
0.0083	-0.077
0.0166	-0.077
0.025	-0.077
0.0333	-0.077
0.0416	-0.077
0.05	-0.077
0.0583	-0.077
0.0666	-0.077
0.075	-0.077
0.0833	-0.077
0.0916	-0.077
0.1	-0.077
0.1083	-0.077
0.1166	-0.077
0.125	-0.077
0.1333	-0.077
0.1416	-0.077
0.15	-0.077
0.1583	-0.077
0.1666	-0.077
0.175	-0.077
0.1833	-0.077
0.1916	-0.077
0.2	-0.077
0.2083	-0.077
0.2166	-0.077
0.225	-0.077
0.2333	-0.077
0.2416	-0.077
0.25	-0.077
0.2583	-0.077
0.2666	-0.077
0.275	-0.077
0.2833	-0.077
0.2916	-0.077
0.3	-0.077
0.3083	-0.077
0.3166	-0.077
0.325	-0.077
0.3333	-0.077
0.35	-0.077
0.3666	-0.077
0.3833	-0.077
0.4	-0.077
0.4166	-0.077
0.4333	-0.077
0.45	-0.077
0.4666	-0.077
0.4833	-0.077
0.5	-0.077
0.5166	-0.077
0.5333	-0.077
0.55	-0.077
0.5666	-0.077
0.5833	-0.077
0.6	-0.077
0.6166	-0.077
0.6333	-0.077
0.65	-0.077
0.6666	-0.077
0.6833	-0.077
0.7	-0.077
0.7166	-0.077
0.7333	-0.077
0.75	-0.077
0.7666	-0.077
0.7833	-0.077
0.8	-0.077
0.8166	-0.077
0.8333	-0.077
0.85	-0.077
0.8666	-0.077
0.8833	-0.077
0.9	-0.077
0.9166	-0.077
0.9333	-0.077
0.95	-0.077
0.9666	-0.077
0.9833	-0.077
1	-0.077
1.2	-0.077
1.4	-0.077
1.6	-0.077
1.8	-0.077
2	-0.077
2.2	-0.077
2.4	-0.077
2.6	-0.077
2.8	-0.077
3	-0.077
3.2	-0.077
3.4	-0.077
3.6	-0.077
3.8	-0.077
4	-0.077
4.2	-0.077
4.4	-0.077
4.6	-0.077
4.8	-0.077
5	-0.077
5.2	-0.077
5.4	-0.077
5.6	-0.077
5.8	-0.077
6	-0.077
6.2	-0.077
6.4	-0.077
6.6	-0.077
6.8	-0.077
7	-0.077
7.2	-0.077
7.4	-0.077
7.6	-0.077
7.8	-0.077
8	-0.077
8.2	-0.077
8.4	-0.077
8.6	-0.077
8.8	-0.077
9	-0.077
9.2	-0.077
9.4	-0.077
9.6	-0.077
9.8	-0.077
10	-0.077
11	0
12	0
13	0
14	0
15	-0.077
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	0
32	0
33	0
34	0
35	0
36	0
37	0
38	0
39	0
40	0
41	0
42	0
43	0
44	0
45	0
46	0
47	0
48	0
49	0
50	0
51	0
52	0
53	0
54	0
55	0
56	0
57	0
58	0
59	0
60	0
61	0
62	0
63	0
64	0
65	0
66	0
67	0
68	0
69	0
70	0
71	0
72	0
73	0
74	0
75	0
76	0
77	0
78	0
79	0
80	0
81	0
82	0
83	0.077
84	0
85	0
86	0
87	0
88	0
89	0
90	0
91	0
92	0
93	0
94	0
95	0
96	0
97	0
98	0
99	0
100	0
101	0
102	0
103	0.077
104	0
105	0
106	0
107	0
108	0
109	0
110	0
111	0
112	0
113	0
114	0
115	0
116	0
117	0
118	0
119	-0.077
120	0

POMPANO BEACH
IW-1
1,811 -1,827
DRAWDOWN DATA

Time (minutes(	Water Level (feet)
0	-0.077
0.0083	-0.077
0.0166	-0.077
0.025	-0.077
0.0333	-0.077
0.0416	4.287
0.05	0.389
0.0583	-1.091
0.0666	0.701
0.075	0.701
0.0833	1.091
0.0916	0.857
0.1	1.169
0.1083	1.403
0.1166	1.481
0.125	1.403
0.1333	1.714
0.1416	2.026
0.15	2.104
0.1583	2.416
0.1666	2.494
0.175	2.338
0.1833	2.806
0.1916	2.962
0.2	3.118
0.2083	3.429
0.2166	3.507
0.225	3.663
0.2333	3.741
0.2416	4.053
0.25	4.209
0.2583	4.287
0.2666	4.365
0.275	4.521
0.2833	4.832
0.2916	4.988
0.3	5.144
0.3083	5.144
0.3166	5.3
0.325	5.534
0.3333	5.69
0.35	6.079
0.3666	6.469
0.3833	6.703
0.4	7.093
0.4166	7.482
0.4333	7.638
0.45	8.028
0.4666	8.339
0.4833	8.651
0.5	8.807
0.5166	9.352
0.5333	9.43
0.55	9.664
0.5666	10.21
0.5833	10.443
0.6	10.755
0.6166	11.145
0.6333	11.534
0.65	11.768
0.6666	12.08
0.6833	12.391
0.7	12.703
0.7166	12.781
0.7333	13.093
0.75	13.638
0.7666	14.028
0.7833	14.339
0.8	14.417
0.8166	14.573
0.8333	15.118
0.85	15.274
0.8666	15.586
0.8833	15.975
0.9	16.131
0.9166	16.521
0.9333	16.91
0.95	16.91
0.9666	17.222
0.9833	17.689
1	17.923
1.2	21.506
1.4	24.465
1.6	27.892
1.8	30.773
2	33.653
2.2	36.455
2.4	39.024
2.6	41.592
2.8	44.316
3	46.494
3.2	48.984
3.4	51.473
3.6	53.496
3.8	55.674
4	57.774
4.2	59.718
4.4	61.584
4.6	63.372
4.8	65.238
5	67.104
5.2	68.736
5.4	70.213
5.6	72.001
5.8	73.555
6	74.799
6.2	76.508
6.4	77.985
6.6	79.306
6.8	80.393
7	81.714
7.2	83.035
7.4	84.045
7.6	85.132
7.8	86.375
8	87.463
8.2	88.395
8.4	89.404
8.6	90.492
8.8	91.423
9	92.355
9.2	93.132
9.4	93.986
9.6	94.607
9.8	95.539
10	96.393
11	99.809
12	102.992
13	105.32
14	107.571
15	109.511
16	111.063
17	112.46
18	113.468
19	114.477
20	115.175
21	115.951
22	116.494
23	117.037
24	117.425
25	117.813
26	118.123
27	118.511
28	118.821
29	118.821
30	118.976
31	119.364
32	119.519
33	119.674
34	119.519
35	119.829
36	119.907
37	119.907
38	119.907
39	120.14
40	120.062
41	120.217
42	120.217
43	120.295
44	120.295
45	120.372
46	120.45
47	120.528
48	120.528
49	120.372
50	120.295
51	120.45
52	120.45
53	120.45
54	120.528
55	120.372
56	120.528
57	120.683
58	120.605
59	120.605
60	120.528
61	120.372
62	120.45
63	120.605
64	120.605
65	120.605
66	120.683
67	120.605
68	120.683
69	120.683
70	120.45
71	120.528
72	120.76
73	120.838
74	120.683
75	120.838
76	120.838
77	120.915
78	120.838
79	120.915
80	120.683
81	120.76
82	120.683
83	120.76
84	120.76
85	120.683
86	120.838
87	120.838
88	120.76
89	120.838
90	120.76
91	120.838
92	120.915
93	120.915
94	120.76
95	120.838
96	120.838
97	120.915
98	120.915
99	120.838
100	120.838
101	120.915
102	120.838
103	120.915
104	120.915
105	120.915
106	120.915
107	120.915
108	120.915
109	120.76
110	120.683
111	120.838
112	120.915
113	120.915
114	120.915
115	121.07
116	121.07
117	121.07
118	120.993
119	120.915
120	121.07
121	121.148
122	121.148
123	121.148
124	121.07
125	121.07
126	121.07
127	121.07
128	121.148
129	121.148
130	121.226
131	121.07
132	121.07
133	121.148
134	121.148
135	121.226
136	121.226
137	121.226
138	121.226
139	121.613
140	122.001
141	122.234
142	122.389
143	121.303
144	120.993
145	121.226
146	121.226
147	121.07
148	121.148
149	121.226
150	121.07
151	121.148
152	121.226
153	121.226
154	121.226
155	121.303
156	121.303
157	121.226
158	121.303
159	121.303
160	121.303
161	121.226
162	121.226
163	121.226
164	121.303
165	121.303
166	121.226
167	121.226
168	121.303
169	121.07
170	121.07
171	121.07
172	121.226
173	121.303
174	121.303
175	121.303
176	121.226
177	121.303
178	121.226
179	121.303
180	121.148
181	121.226
182	121.226
183	121.148
184	121.148
185	121.303
186	121.148
187	121.226
188	121.148
189	121.226
190	121.07
191	121.148
192	121.07
193	121.226
194	121.148
195	121.303
196	121.226
197	121.148
198	121.226
199	121.226
200	121.148
201	121.226
202	121.303
203	121.226
204	121.226
205	121.303
206	121.226
207	121.226
208	121.458
209	121.381
210	121.303
211	121.226
212	121.148
213	121.381
214	121.303
215	121.381
216	121.381
217	121.303
218	121.458
219	121.226
220	121.303
221	121.226
222	121.458
223	121.226
224	121.458
225	121.381
226	121.303
227	121.381
228	121.458
229	121.381
230	121.381
231	121.226
232	121.381
233	121.303
234	121.458
235	121.303
236	121.458
237	121.381
238	121.381
239	121.381
240	121.381

POMPANO BEACH
IW-1
1,811 - 1,827
RECOVERY DATA

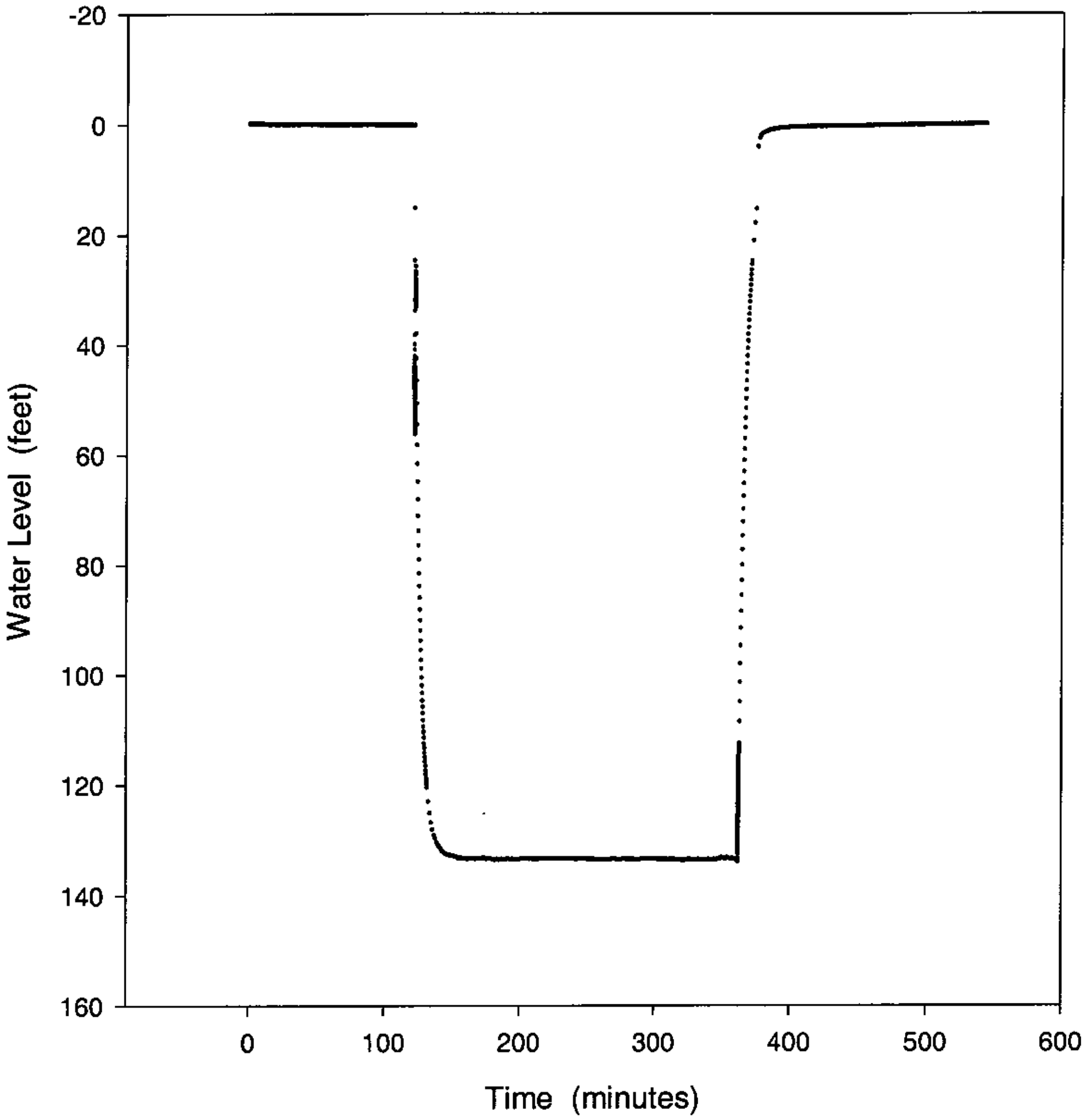
Time (minutes)	Water Level (feet)
0	121.226
0.0083	121.226
0.0166	121.148
0.025	120.838
0.0333	120.683
0.0416	120.528
0.05	120.45
0.0583	120.295
0.0666	120.217
0.075	120.14
0.0833	119.985
0.0916	119.907
0.1	119.752
0.1083	119.597
0.1166	119.519
0.125	119.364
0.1333	119.287
0.1416	119.209
0.15	119.054
0.1583	118.899
0.1666	118.821
0.175	118.744
0.1833	118.588
0.1916	118.433
0.2	118.356
0.2083	118.201
0.2166	118.123
0.225	117.968
0.2333	117.89
0.2416	117.735
0.25	117.658
0.2583	117.502
0.2666	117.425
0.275	117.27
0.2833	117.192
0.2916	117.037
0.3	116.959
0.3083	116.804
0.3166	116.727
0.325	116.571
0.3333	116.494
0.35	116.261
0.3666	116.028
0.3833	115.796
0.4	115.563
0.4166	115.33
0.4333	115.097
0.45	114.865
0.4666	114.632
0.4833	114.399
0.5	114.167
0.5166	114.011
0.5333	113.779
0.55	113.546
0.5666	113.313
0.5833	113.08
0.6	112.848
0.6166	112.615
0.6333	112.382
0.65	112.149
0.6666	111.916
0.6833	111.761
0.7	111.528
0.7166	111.296
0.7333	111.063
0.75	110.83
0.7666	110.597
0.7833	110.365
0.8	110.132
0.8166	109.899
0.8333	109.666
0.85	109.511
0.8666	109.278
0.8833	109.045
0.9	108.813
0.9166	108.58
0.9333	108.425
0.95	108.192
0.9666	107.959
0.9833	107.726
1	107.493
1.2	104.855
1.4	102.371
1.6	99.887
1.8	97.48
2	95.151
2.2	92.899
2.4	90.725
2.6	88.55
2.8	86.375
3	84.355
3.2	82.336
3.4	80.316
3.6	78.373
3.8	76.508
4	74.643
4.2	72.856
4.4	71.068
4.6	69.358
4.8	67.648
5	66.016
5.2	64.461
5.4	62.828
5.6	61.351
5.8	59.873
6	58.396
6.2	56.996
6.4	55.596
6.6	54.196
6.8	52.874
7	51.629
7.2	50.384
7.4	49.14
7.6	47.895
7.8	46.728
8	45.561
8.2	44.471
8.4	43.304
8.6	42.293
8.8	41.203
9	40.191
9.2	39.257
9.4	38.324
9.6	37.39
9.8	36.455
10	35.599
11	31.395
12	27.58
13	24.31
14	21.428
15	18.858
16	16.599
17	14.495
18	12.781
19	11.223
20	9.898
21	8.651
22	7.56
23	6.625
24	5.846
25	5.066
26	4.443
27	3.897
28	3.429
29	2.962
30	2.572
31	2.182
32	1.948
33	1.714
34	1.481
35	1.247
36	1.091
37	0.935
38	0.779
39	0.701
40	0.545
41	0.467
42	0.389
43	0.311
44	0.233
45	0.233
46	0.155
47	0.155
48	0.077
49	0.077
50	0
51	0
52	-0.077
53	-0.077
54	-0.077
55	-0.077
56	-0.077
57	-0.077
58	-0.155
59	-0.155
60	-0.155
61	-0.155
62	-0.155
63	-0.155
64	-0.155
65	-0.155
66	-0.155
67	-0.155
68	-0.155
69	-0.155
70	-0.155
71	-0.233
72	-0.233
73	-0.233
74	-0.233
75	-0.233
76	-0.233
77	-0.233
78	-0.233
79	-0.233
80	-0.233
81	-0.233
82	-0.233
83	-0.233
84	-0.233
85	-0.233
86	-0.233
87	-0.233
88	-0.233
89	-0.233
90	-0.233
91	-0.311
92	-0.233
93	-0.233
94	-0.233
95	-0.233
96	-0.233
97	-0.233
98	-0.233
99	-0.233
100	-0.233
101	-0.233
102	-0.233
103	-0.233
104	-0.233
105	-0.233
106	-0.233
107	-0.233
108	-0.233
109	-0.233
110	-0.233
111	-0.233
112	-0.311
113	-0.311
114	-0.233
115	-0.233
116	-0.233
117	-0.233
118	-0.233
119	-0.233
120	-0.233
121	-0.233
122	-0.233
123	-0.233
124	-0.233
125	-0.233
126	-0.233
127	-0.233
128	-0.233
129	-0.233
130	-0.233
131	-0.311
132	-0.311
133	-0.233
134	-0.233
135	-0.233
136	-0.233
137	-0.233
138	-0.233
139	-0.233
140	-0.233
141	-0.233
142	-0.233
143	-0.233
144	-0.233
145	-0.233
146	-0.233
147	-0.233
148	-0.233
149	-0.233
150	-0.233
151	-0.233
152	-0.233
153	-0.233
154	-0.233
155	-0.233
156	-0.233
157	-0.233
158	-0.233
159	-0.233
160	-0.233
161	-0.233
162	-0.233
163	-0.233
164	-0.233
165	-0.233
166	-0.233
167	-0.233
168	-0.233
169	-0.233
170	-0.233
171	-0.233
172	-0.233
173	-0.233
174	-0.233
175	-0.233
176	-0.233
177	-0.233
178	-0.233
179	-0.233
180	-0.233
181	-0.155
182	-0.233
183	-0.155
184	-0.233
185	-0.155
186	-0.155
187	-0.155
188	-0.233
189	-0.155
190	-0.155
191	-0.155
192	-0.155
193	-0.155
194	-0.155
195	-0.155
196	-0.155

Appendix H

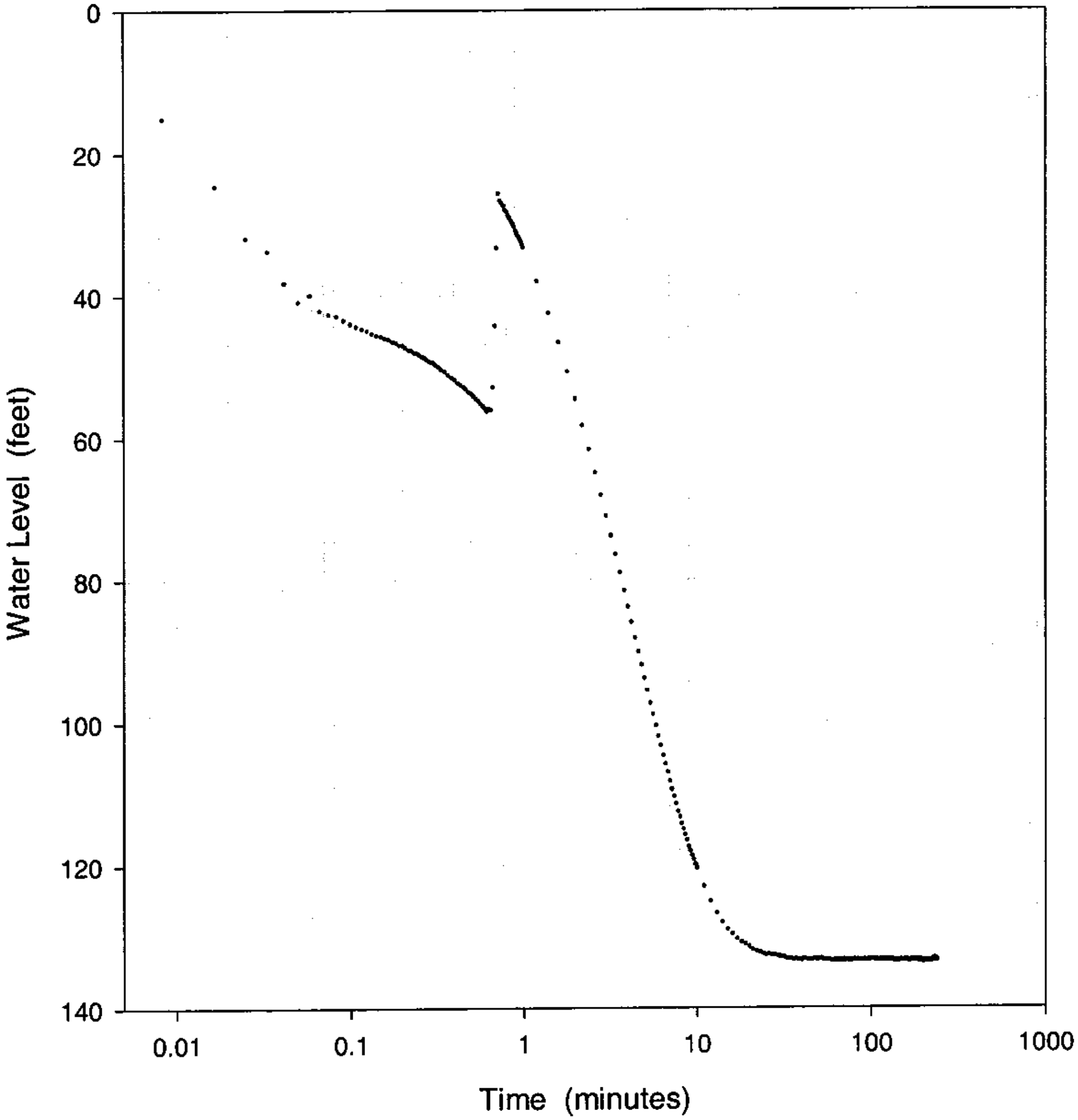
Straddle Packer Test No. 6 @ IW-1

1,519 - 1,550

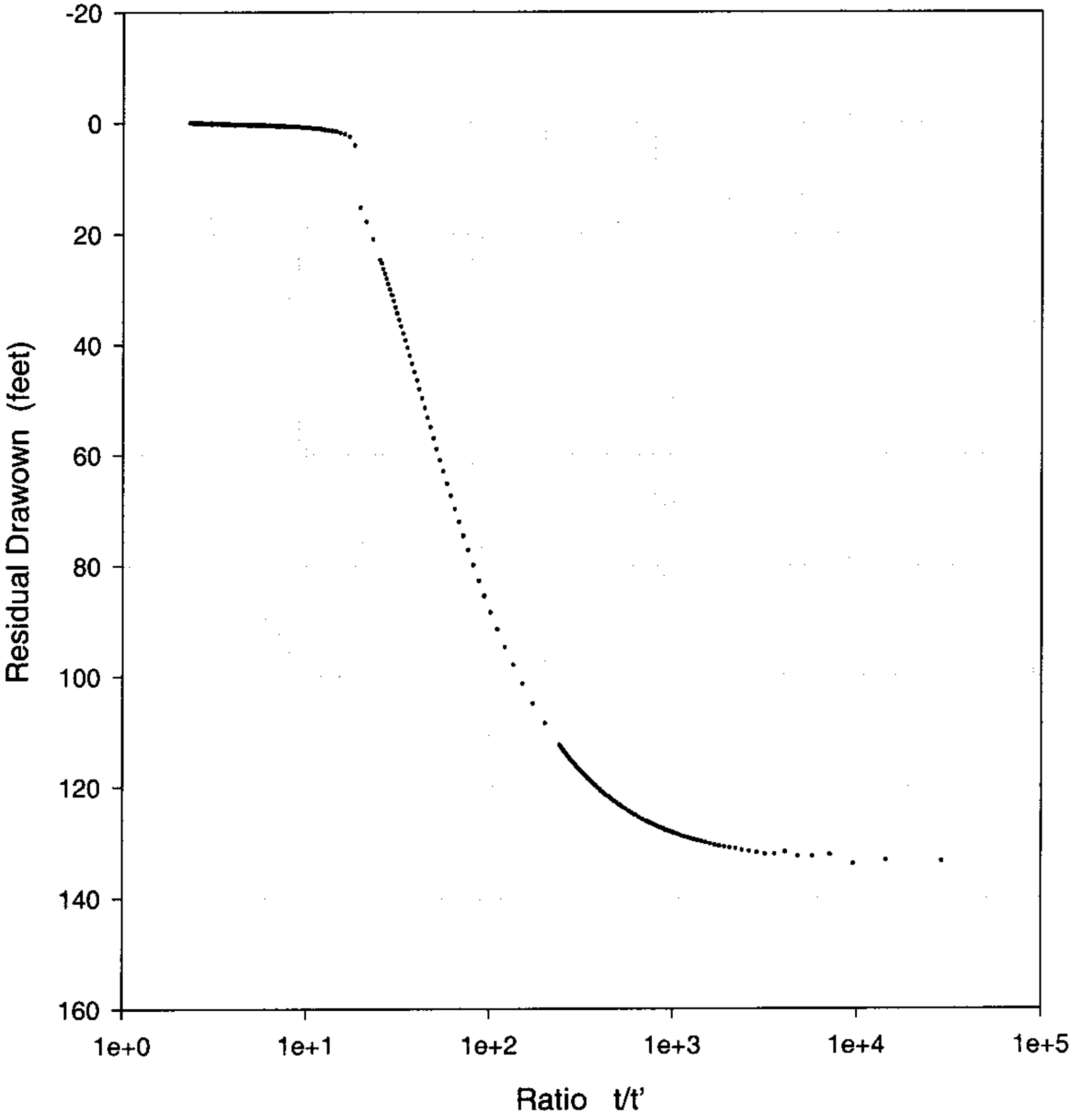
POMPANO BEACH
IW-1
1,519 - 1,550
BACKGROUND, DRAWDOWN AND RECOVERY DATA



POMPANO BEACH
IW-1
1,519 - 1,550
DRAWDOWN



POMPANO BEACH
IW-1
1,519 - 1,550
RESIDUAL DRAWDOWN vs t/t'



POMPANO BEACH
IW-1
1,519 - 1,550
BACKGROUND DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	-0.156	0.8	-0.156	21	0	89	0.078
0.0083	-0.156	0.8166	-0.156	22	0	90	0.078
0.0166	-0.156	0.8333	-0.156	23	0	91	0.078
0.025	-0.156	0.85	-0.078	24	0	92	0.078
0.0333	-0.156	0.8666	-0.156	25	0	93	0.156
0.0416	-0.156	0.8833	-0.156	26	0	94	0.156
0.05	-0.156	0.9	-0.156	27	0	95	0.156
0.0583	-0.156	0.9166	-0.156	28	0	96	0.156
0.0666	-0.156	0.9333	-0.156	29	0	97	0.156
0.075	-0.156	0.95	-0.156	30	0	98	0.156
0.0833	-0.156	0.9666	-0.156	31	0	99	0.156
0.0916	-0.156	0.9833	-0.156	32	0	100	0.156
0.1	-0.156	1	-0.156	33	0	101	0.156
0.1083	-0.156	1.2	-0.156	34	0	102	0.156
0.1166	-0.156	1.4	-0.156	35	0	103	0.156
0.125	-0.156	1.6	-0.156	36	0	104	0.156
0.1333	-0.156	1.8	-0.156	37	0	105	0.156
0.1416	-0.156	2	-0.078	38	0	106	0.156
0.15	-0.156	2.2	-0.156	39	0	107	0.156
0.1583	-0.156	2.4	-0.156	40	0	108	0.156
0.1666	-0.156	2.6	-0.156	41	0	109	0.156
0.175	-0.156	2.8	-0.156	42	0	110	0.156
0.1833	-0.156	3	-0.156	43	0	111	0.156
0.1916	-0.156	3.2	-0.156	44	0	112	0.156
0.2	-0.078	3.4	-0.156	45	0	113	0.156
0.2083	-0.078	3.6	-0.156	46	0	114	0.156
0.2166	-0.156	3.8	-0.078	47	0	115	0.156
0.225	-0.156	4	-0.078	48	0	116	0.234
0.2333	-0.156	4.2	-0.078	49	0	117	0.156
0.2416	-0.156	4.4	-0.156	50	0	118	0.234
0.25	-0.156	4.6	-0.156	51	0	119	0.156
0.2583	-0.156	4.8	-0.156	52	0.078	120	0.156
0.2666	-0.078	5	-0.156	53	0.078	121	0.234
0.275	-0.156	5.2	-0.156	54	0.078	122	0.156
0.2833	-0.156	5.4	-0.078	55	0		
0.2916	-0.156	5.6	-0.156	56	0.078		
0.3	-0.156	5.8	-0.078	57	0		
0.3083	-0.156	6	-0.156	58	0.078		
0.3166	-0.156	6.2	-0.156	59	0.078		
0.325	-0.156	6.4	-0.156	60	0.078		
0.3333	-0.156	6.6	-0.078	61	0.078		
0.35	-0.156	6.8	-0.156	62	0		
0.3666	-0.156	7	-0.078	63	0.078		
0.3833	-0.156	7.2	-0.078	64	0.078		
0.4	-0.156	7.4	-0.078	65	0.078		
0.4166	-0.156	7.6	-0.078	66	0.078		
0.4333	-0.156	7.8	-0.078	67	0.078		
0.45	-0.156	8	-0.078	68	0.078		
0.4666	-0.156	8.2	-0.078	69	0.078		
0.4833	-0.156	8.4	-0.078	70	0.078		
0.5	-0.156	8.6	-0.156	71	0.078		
0.5166	-0.156	8.8	-0.078	72	0.078		
0.5333	-0.156	9	-0.078	73	0.078		
0.55	-0.156	9.2	-0.078	74	0.078		
0.5666	-0.156	9.4	-0.078	75	0.078		
0.5833	-0.156	9.6	-0.156	76	0.078		
0.6	-0.156	9.8	-0.078	77	0.078		
0.6166	-0.156	10	-0.078	78	0.078		
0.6333	-0.156	11	-0.078	79	0.078		
0.65	-0.156	12	-0.078	80	0.078		
0.6666	-0.156	13	-0.078	81	0.078		
0.6833	-0.156	14	0	82	0.078		
0.7	-0.156	15	0	83	0.078		
0.7166	-0.156	16	0	84	0.078		
0.7333	-0.156	17	-0.078	85	0.078		
0.75	-0.156	18	0	86	0.078		
0.7666	-0.156	19	0	87	0.078		
0.7833	-0.156	20	0	88	0.078		

POMPANO BEACH
IW-1
1,519 - 1,550
DRAWDOWN DATA

Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)	Time (minutes)	Water Level (feet)
0	0.156	0.7666	27.379	17	130.376	83	133.403	149	133.403
0.0083	15.136	0.7833	28.003	18	130.842	84	133.326	150	133.481
0.0166	24.65	0.8	28.237	19	131.075	85	133.403	151	133.481
0.025	31.9	0.8166	28.782	20	131.463	86	133.403	152	133.481
0.0333	33.771	0.8333	29.094	21	131.929	87	133.403	153	133.481
0.0416	38.213	0.85	29.562	22	132.084	88	133.403	154	133.481
0.05	40.863	0.8666	29.952	23	132.239	89	133.403	155	133.403
0.0583	39.928	0.8833	30.342	24	132.472	90	133.481	156	133.326
0.0666	42.109	0.9	30.887	25	132.627	91	133.403	157	133.403
0.075	42.655	0.9166	31.199	26	132.55	92	133.403	158	133.481
0.0833	42.888	0.9333	31.589	27	132.705	93	133.403	159	133.403
0.0916	43.434	0.95	31.978	28	132.705	94	133.403	160	133.481
0.1	43.979	0.9666	32.368	29	132.782	95	133.403	161	133.481
0.1083	44.369	0.9833	32.914	30	132.86	96	133.326	162	133.403
0.1166	44.68	1	33.226	31	132.938	97	133.403	163	133.559
0.125	44.914	1.2	37.979	32	133.015	98	133.326	164	133.481
0.1333	45.303	1.4	42.421	33	133.171	99	133.326	165	133.559
0.1416	45.615	1.6	46.55	34	133.171	100	133.248	166	133.559
0.15	45.771	1.8	50.678	35	133.171	101	133.248	167	133.559
0.1583	46.005	2	54.494	36	133.326	102	133.326	168	133.481
0.1666	46.16	2.2	58.232	37	133.248	103	133.326	169	133.403
0.175	46.472	2.4	61.579	38	133.326	104	133.326	170	133.403
0.1833	46.628	2.6	64.849	39	133.326	105	133.326	171	133.403
0.1916	47.017	2.8	68.04	40	133.403	106	133.403	172	133.403
0.2	47.017	3	70.997	41	133.248	107	133.326	173	133.326
0.2083	47.329	3.2	73.721	42	133.248	108	133.326	174	133.326
0.2166	47.64	3.4	76.366	43	133.326	109	133.403	175	133.403
0.225	47.718	3.6	78.933	44	133.326	110	133.403	176	133.403
0.2333	48.03	3.8	81.5	45	133.326	111	133.403	177	133.403
0.2416	48.108	4	83.756	46	133.403	112	133.403	178	133.403
0.25	48.341	4.2	85.934	47	133.248	113	133.326	179	133.403
0.2583	48.575	4.4	88.111	48	133.248	114	133.326	180	133.326
0.2666	48.731	4.6	90.055	49	133.326	115	133.403	181	133.481
0.275	48.965	4.8	91.921	50	133.248	116	133.326	182	133.403
0.2833	49.198	5	93.787	51	133.248	117	133.326	183	133.481
0.2916	49.354	5.2	95.497	52	133.171	118	133.326	184	133.481
0.3	49.432	5.4	97.285	53	133.326	119	133.403	185	133.403
0.3083	49.666	5.6	98.84	54	133.403	120	133.248	186	133.559
0.3166	49.899	5.8	100.472	55	133.326	121	133.481	187	133.403
0.325	50.055	6	101.949	56	133.326	122	133.326	188	133.481
0.3333	50.366	6.2	103.27	57	133.326	123	133.326	189	133.481
0.35	50.678	6.4	104.669	58	133.403	124	133.403	190	133.481
0.3666	51.145	6.6	105.834	59	133.481	125	133.403	191	133.559
0.3833	51.457	6.8	107	60	133.559	126	133.403	192	133.326
0.4	51.768	7	108.243	61	133.559	127	133.403	193	133.559
0.4166	52.236	7.2	109.408	62	133.403	128	133.403	194	133.481
0.4333	52.547	7.4	110.418	63	133.559	129	133.481	195	133.481
0.45	52.859	7.6	111.428	64	133.481	130	133.481	196	133.559
0.4666	53.17	7.8	112.516	65	133.403	131	133.403	197	133.481
0.4833	53.56	8	113.293	66	133.559	132	133.481	198	133.636
0.5	53.793	8.2	114.225	67	133.481	133	133.403	199	133.714
0.5166	54.105	8.4	115.002	68	133.559	134	133.481	200	133.714
0.5333	54.494	8.6	115.778	69	133.403	135	133.559	201	133.559
0.55	54.806	8.8	116.555	70	133.326	136	133.636	202	133.636
0.5666	55.195	9	117.409	71	133.403	137	133.481	203	133.481
0.5833	55.506	9.2	118.031	72	133.481	138	133.559	204	133.481
0.6	55.818	9.4	118.73	73	133.403	139	133.481	205	133.481
0.6166	56.207	9.6	119.273	74	133.481	140	133.481	206	133.481
0.6333	55.896	9.8	119.895	75	133.481	141	133.481	207	133.636
0.65	56.051	10	120.438	76	133.481	142	133.559	208	133.481
0.6666	52.859	11	123.001	77	133.481	143	133.481	209	133.559
0.6833	44.213	12	125.097	78	133.481	144	133.481	210	133.481
0.7	33.303	13	126.805	79	133.403	145	133.559	211	133.481
0.7166	25.664	14	128.047	80	133.326	146	133.481	212	133.559
0.7333	26.678	15	129.057	81	133.326	147	133.403	213	133.559
0.75	27.067	16	129.678	82	133.403	148	133.403	214	133.636

Time (minutes)	Water Level (feet)
215	133.636
216	133.636

POMPANO BEACH
IW-1
1,519 - 1,550
DRAWDOWN DATA

217	133.559
218	133.481
219	133.481
220	133.559
221	133.636
222	133.481
223	133.481
224	133.559
225	133.481
226	133.403
227	133.403
228	133.171
229	133.248
230	133.326
231	133.403
232	133.171
233	133.248
234	133.403
235	133.481
236	133.326
237	133.403
238	133.481
239	133.481
240	133.403

POMPANO BEACH
IW-1
1,519 - 1,550
RECOVERY DATA

Time (minutes)	Water Level (feet)
0	133.559
0.0083	133.403
0.0166	133.248
0.025	133.947
0.0333	132.239
0.0416	132.55
0.05	132.55
0.0583	131.773
0.0666	132.161
0.075	132.161
0.0833	131.851
0.0916	131.618
0.1	131.463
0.1083	131.152
0.1166	130.997
0.125	130.842
0.1333	130.687
0.1416	130.531
0.15	130.299
0.1583	130.066
0.1666	129.91
0.175	129.678
0.1833	129.522
0.1916	129.367
0.2	129.134
0.2083	128.979
0.2166	128.824
0.225	128.591
0.2333	128.436
0.2416	128.203
0.25	128.047
0.2583	127.892
0.2666	127.659
0.275	127.504
0.2833	127.349
0.2916	127.116
0.3	126.96
0.3083	126.728
0.3166	126.572
0.325	126.417
0.3333	126.184
0.35	125.874
0.3666	125.485
0.3833	125.097
0.4	124.787
0.4166	124.398
0.4333	124.01
0.45	123.7
0.4666	123.311
0.4833	123.001
0.5	122.613
0.5166	122.302
0.5333	121.914
0.55	121.603
0.5666	121.215
0.5833	120.904
0.6	120.516
0.6166	120.205
0.6333	119.817
0.65	119.506
0.6666	119.118
0.6833	118.807
0.7	118.497
0.7166	118.108
0.7333	117.798
0.75	117.487
0.7666	117.099
0.7833	116.788
0.8	116.477
0.8166	116.089
0.8333	115.778
0.85	115.468
0.8666	115.157
0.8833	114.769
0.9	114.458
0.9166	114.147
0.9333	113.836
0.95	113.526
0.9666	113.137
0.9833	112.827
1	112.516
1.2	108.554
1.4	104.98
1.6	101.405
1.8	97.985
2	94.72
2.2	91.532
2.4	88.5
2.6	85.545
2.8	82.745
3	79.945
3.2	77.222
3.4	74.654
3.6	72.164
3.8	69.83
4	67.495
4.2	65.238
4.4	63.058
4.6	61.034
4.8	59.01
5	57.064
5.2	55.039
5.4	53.326
5.6	51.535
5.8	49.821
6	48.186
6.2	46.55
6.4	44.992
6.6	43.512
6.8	42.031
7	40.629
7.2	39.304
7.4	38.057
7.6	36.811
7.8	35.564
8	34.395
8.2	33.303
8.4	32.134
8.6	31.121
8.8	30.108
9	29.094
9.2	28.159
9.4	27.223
9.6	26.366
9.8	25.352
10	24.728
11	20.986
12	17.788
13	15.292
14	4.058
15	2.497
16	2.029
17	1.795
18	1.56
19	1.404
20	1.326
21	1.248
22	1.092
23	1.014
24	1.014
25	0.936
26	0.858
27	0.858
28	0.78
29	0.78
30	0.702
31	0.624
32	0.624
33	0.624
34	0.624
35	0.624
36	0.624
37	0.546
38	0.546
39	0.546
40	0.546
41	0.546
42	0.546
43	0.468
44	0.468
45	0.468
46	0.468
47	0.468
48	0.468
49	0.468
50	0.39
51	0.39
52	0.39
53	0.39
54	0.39
55	0.39
56	0.39
57	0.39
58	0.312
59	0.312
60	0.39
61	0.39
62	0.312
63	0.312
64	0.39
65	0.312
66	0.312
67	0.312
68	0.312
69	0.312
70	0.312
71	0.312
72	0.312
73	0.234
74	0.234
75	0.312
76	0.312
77	0.312
78	0.312
79	0.312
80	0.312
81	0.312
82	0.234
83	0.312
84	0.234
85	0.234
86	0.234
87	0.234
88	0.234
89	0.234
90	0.234
91	0.234
92	0.234
93	0.234
94	0.234
95	0.156
96	0.156
97	0.234
98	0.234
99	0.156
100	0.156
101	0.156
102	0.156
103	0.156
104	0.156
105	0.156
106	0.156
107	0.156
108	0.156
109	0.156
110	0.156
111	0.156
112	0.078
113	0.156
114	0.156
115	0.156
116	0.156
117	0.156
118	0.156
119	0.078
120	0.078
121	0.078
122	0.078
123	0.156
124	0.078
125	0.078
126	0.078
127	0.078
128	0.078
129	0.078
130	0.078
131	0.078
132	0.078
133	0.078
134	0.078
135	0.078
136	0.078
137	0.078
138	0.078
139	0.078
140	0.078
141	0.078
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0
154	0
155	0
156	0
157	0
158	0
159	0
160	0
161	0
162	0
163	0
164	0
165	0
166	0
167	0
168	0
169	0
170	0
171	0
172	0
173	-0.078
174	-0.078
175	-0.078
176	-0.078
177	-0.078
178	-0.078
179	-0.078
180	-0.078
181	-0.078
182	-0.078

Packer Test
Procedures and Quality Control

Packer Testing and Quality Control Procedures

General

Check Pipe tally to make sure that packer or packers are set at correct depth.

Note date and time on all recorded data.

Observe the pressuring up of the packer or packers, noting pressure applied to packers.

Monitor and record pressure on packers periodically during all phases of test.

Identify elevation benchmark.

Development

Note time of start of development.

Note method of development (air lift, pumping, etc.)

Check and record conductivity of development fluid initially and thereafter (maximum every 15 minutes).

Visually observe and record turbidity of development fluid (maximum every 15 minutes).

Visually observe and estimate fluid development rate (maximum every 15 minutes).

Continue development until conductivity has stabilized for 45 to 60 minutes.

Background

Observe and record the installation depths of the transducers (inside drill pipe and annulus).

Check and record transducer readings (maximum every 15 minutes).

Official background does not start until stabilization from development has occurred.

Continue recording background for 2 hours.

Pumping Test

Prior to starting pumping measure and record water level in drill pipe and annulus (referenced to a known benchmark).

Observe and record water levels in drill pipe and annulus (maximum every 10 minutes).

Observe and record the pumping rate (maximum every 10 minutes).

Pumping shall continue for a minimum of 4 hours.

Just prior to ending pumping observe water sample collection in accordance with water sampling checklist.

After stopping pump observe and record total volume of water pumped.

Recovery

Observe and record water levels in drill pipe and annulus (maximum every 10 minutes).

Recovery shall continue for a minimum of 3 hours.

APPENDIX I

PACKER TEST WATER QUALITY LABORATORY RESULTS

Client Project: Pompano Beach
Lab Project: N0106615
Report Date: 06/28/01

Sanders Laboratories
Environmental Testing Services

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

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0106615-01	packer #1 1631-1647 grab	Ground Water	6/27/01 6:30

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst
Ammonia-N	350.3	0.26		0.05	mg/L	6/28/01 15:00	DH
Chloride	4500Cl-B	17000		500	mg/L	6/28/01 12:00	DW
Conductivity	120.1	40200		0.1	umhos/cm	6/28/01 12:30	DW
Nitrogen, Total Kjeldahl	351.2	0.23*		0.05	mg/L	6/28/01 9:49	DH
Total Dissolved Solids	160.1	28100		5	mg/L	6/27/01 15:45	CC

Approved by:

Craig Toler
Laboratory Director

Comments:

* Preliminary result

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N010665

Page ______ of ______

lient Younggquist Bros
ddress FT Myers
hone 941-489-4444 Fax

Report To:
Bill To:
P.O. #
Project Name Pompano Packer #1
Project Location:

Sample Supply: GW
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 6/28/01

Sampled By (PRINT) Cameron Webster
Sampler Signature Cam Weber

ottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	PRESERVATIVES UNPRESERVED	PRESERVATIVES H_2SO_4	PRESERVATIVES HNO_3	PRESERVATIVES HCL	ANALYSES REQUEST TDS	Cl-	COND	NH3	TKN								Sample ID #
1	TDS (Rush)	6-27	630 am	G																		
2	Chlorides			G																		
3	Conductivity																					
4	Ammonia																					
5	TKN																					
	Packer #1 (1631-1647)									X	X	X										01 A
	"	↓	↓	↓									X	X								01 B

ottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				Cam Weber	6-27	10:15	Kathy King	6/27/01	1025
			COOLER #	Kathy King	6/27/01	1505	[illegible]	6/27/01	1855
			COOLER SEAL INTACT Yes No						

COMMENTS:
6 bottles
Fairo to BCNIED
@1800 on 6/28/01

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0106617
Report Date: 06/28/01

Sanders Laboratories
Environmental Testing Services

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

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0106617-01	packer #2 1731-1747 grab	Ground Water	6/27/01 10:15

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst
Ammonia-N	350.3	0.17		0.05	mg/L	6/28/01 15:00	DH
Chloride	4500Cl-B	19000		500	mg/L	6/28/01 12:00	DW
Conductivity	120.1	46600		0.1	umhos/cm	6/28/01 12:30	DW
Nitrogen, Total Kjeldahl	351.2	0.35		0.05	mg/L	6/28/01 9:49	DH
Total Dissolved Solids	160.1	32600		5	mg/L	6/27/01 15:45	CC

Approved by:

Comments:

Craig Toler
Laboratory Director

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N010617

Page ______ of ______

Client Youngquist Bros
Address FT Myers
Phone 941-489-4444 Fax

Report To:
Bill To:
P.O. #
Project Name Pompano Packer #2
Project Location:

Sample Supply: GW
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 6/28/01

Sampled By (PRINT) Cameron Webster
Sampler Signature Cam Webs

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL	ANALYSES REQUEST TDS	Cl-	Cond	NH3	TKN								Sample ID #
1	TDS (Rush)	6-27	1015	G																		
2	Chlorides	↓	↓	↓																		
3	Conductivity																					
4	Ammonia																					
5	TKN																					
	Packer #2 (1731-1747)									X	X	X										01 A
	"												X	X								01 B

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				Cam Webs	6-27	1015	Kathy King	6/27/01	10:25
				Kathy King	6/27/01	1805	[illegible]	6/27/01	1805

COMMENTS:
FAXD TO BETH & ED
@ 1800 on 6/28/01

COOLER #

COOLER SEAL INTACT
Yes No

1050 Endeavor Ct., Nokomis, FL 34275-3623 • (941)488-8103 • FAX 484-6774
16880 Gator Road, Fort Myers, FL 33912 • (941) 590-0337 • FAX (941) 590-05

Sanders Laboratories
Environmental Testing Services

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0106734
Report Date: 07/02/01

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

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0106734-01	packer #3 1931-1947 grab	Ground Water	6/28/01 10:10

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst
Ammonia-N	350.3	0.15		0.05	mg/L	7/2/01 13:30	DH
Chloride	300.0	16400		15	mg/L	7/1/01 15:50	DW
Conductivity	120.1	46100		0.1	umhos/cm	7/2/01 12:30	DW
Nitrogen, Total Kjeldahl	351.2	0.16		0.05	mg/L	6/30/01 15:30	NL
Total Dissolved Solids	160.1	34500		5	mg/L	6/30/01 11:30	CC

Approved by:

Comments:

Craig Toler
Laboratory Director

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N0106734

Page ______ of ______

Client Younquist Bros
Address Ft Myers
Phone 941-489-4444 Fax

Report To: Ed. McCullers
Bill To:
P.O. #
Project Name Pompano 1w#1
Project Location: Packer # 3

Sample Supply: GW
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 7/2/01

Sampled By (PRINT) Cameron Webster

Sampler Signature Cam Web

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL		ANALYSES REQUEST TDS, Cl-, Cond	NH_3, TKN	Sample ID #
1	~~TDS~~ ~~(Rush)~~ Packer #3	6-28	10^{10} PM	G	X	X					X	~~X~~ mo	01A
2	~~Chlorides~~ Packer # 3	6-28			X		X					X	01B
3	~~Conductivity~~ mo												
4	~~Ammonia~~ (1931-1947)												
5	~~TKN~~												

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				Cam Web	6-29-01	1335		6-29-01	1535
					6-29-01	1555	Rachel Clausen	6/29/01	1653

COMMENTS:
Faxed to Beth & Ed McCullers
7/2@15:30

COOLER #

COOLER SEAL INTACT
Yes No

Sanders Laboratories
Environmental Testing Services

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0107262
Report Date: 07/16/01

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

Lab ID	**Sample Description**	**Sample Source**	**Sample Date/Time**
N0107262-01	straddle packer #4 1679'-1695' grab	Ground Water	7/13/01 3:30

Analysis	**Method**	**Results**	**Qual**	**Detection Limit**	**Units**	**AnalysisDate/Time**	**Analyst**
Ammonia-N	350.3	0.22		0.05	mg/L	7/16/01 13:00	RB
Chloride	4500Cl-B	16400		200	mg/L	7/16/01 11:30	DW
Conductivity	120.1	37100		0.1	umhos/cm	7/16/01 12:45	DW
Nitrogen, Total Kjeldahl	351.2	< 0.25		0.25	mg/L	7/16/01 11:40	DH
Total Dissolved Solids	160.1	29900		5	mg/L	7/13/01 16:15	CC

Approved by:

Laura H Sullivan

Craig Toler/Lab Director
Laura Sullivan/QA Officer
Kathrine Bartkiewicz/Lab Supervisor

Comments:

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N0107262

Page 1 of 1

Client YBI
Address Ft Myers
Phone 941-489-4444 Fax

Report To: Cameron or Jimmy + Ed McCullers
Bill To:
P.O. #
Project Name Pompano
Project Location: Straddle Packer #4 1679'-1695'

Sample Supply: GW
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 7/25/01

Sampled By (PRINT) Cameron Webster
Sampler Signature Cam Webster

		Sample			PRESERVATIVES						ANALYSES REQUEST												
Bottle #	SAMPLE DESCRIPTION	DATE	TIME	TYPE	4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL			TKN	Ammonia	TDS	Chlorides	Conductivity		CXTG					Sample ID #
1	Straddle Packer #4 1679'-1695'	7-13-01	3^{30} am	G	1	1						1	1										01A
2	"				1	1								1	1	1							01B
3	"				1	1												1					
4	"				1	1												1					
5	"				1	1												1					
6	"																	1					

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Cameron Webster	7-13-01	12^{15}		7/13/01	1215
	7/13/01	1600	Cynthia Thompson	7/13/01	1600

COMMENTS:

RECEIVED JUL 18 2001

COOLER #

COOLER SEAL INTACT
Yes No

1050 Endeavor Ct., Nokomis, Fl 34275-3693 • (941)488-8103 • FAX 484-6774
16880 Gator Road, Fort Myers, FL 33912 • (941) 590-0337 • FAX (941) 590-0536

File

Sanders Laboratories
Environmental Testing Services

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0107344
Report Date: 07/19/01

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

Lab ID	**Sample Description**	**Sample Source**	**Sample Date/Time**
N0107344-01	straddle packer #5 grab	Ground Water	7/18/01 5:00

Analysis	**Method**	**Results**	**Qual**	**Detection Limit**	**Units**	**AnalysisDate/Time**	**Analyst**
Ammonia-N	350.3	0.09		0.05	mg/L	7/19/01 13:00	DH
Chloride	4500Cl-B	20000		500	mg/L	7/19/01 9:30	DW
Conductivity	120.1	48800		0.1	umhos/cm	7/19/01 13:30	DW
Nitrogen, Total Kjeldahl	351.2	0.33		0.05	mg/L	7/19/01 11:40	DH
Total Dissolved Solids	160.1	35100		5	mg/L	7/18/01 17:30	CC

Approved by:

Craig Toler

Craig Toler/Lab Director
Laura Sullivan/QA Officer
Kathrine Bartkiewicz/Lab Supervisor

Comments:

RECEIVED JUL 2 5 2001

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N0107344.

Page ______ of ______

Client YBI
Address FT Myers
Phone 941-489-4444 Fax

Report To:
Bill To:
P.O. #
Project Name Pompano Straddle Packer # 5
Project Location: Pompano

Sample Supply: B.W.
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 7/20/01

Sampled By (PRINT) Cameron Webster
Sampler Signature Cam Webster

		Sample			PRESERVATIVES						ANALYSES REQUEST												
Bottle #	SAMPLE DESCRIPTION	DATE	TIME	TYPE	4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL		TDS	Chlorides	Conductivity	TKN	NH3								Sample ID #
6	Straddle Packer # 5	7-18-01	5 am	G							1	1	1	1	1								01A/01B
	1811' - 1827'																						

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED · DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				Cameron Webster	7-18-01	11:20		7-18-01	1120
	COMMENTS:		COOLER #		7-18-01	1640	Cipollice Thump	7/18/01	1640
			COOLER SEAL INTACT Yes No						

1050 Endeavor Ct., Nokomis, FL 34275-3693 • (941)488-8103 • FAX 484-6774
16880 Gator Road, Fort Myers, FL 33912 • (941) 590-0337 • FAX (941) 590-0530

Sanders Laboratories
Environmental Testing Services

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0107525
Report Date: 07/30/01

RECEIVED AUG - 3 2001

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

Lab ID	Sample Description	Sample Source	Sample Date/Time
N0107525-01	packer test 6 (1519-1550) iw-1 grab	Ground Water	7/19/01 0:00

Analysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst
Ammonia-N	350.3	0.65	J5	0.05	mg/L	7/30/01 10:30	DH
Chloride	300.0	2800		3	mg/L	7/28/01 17:20	DW
Conductivity	120.1	7750		0.1	umhos/cm	7/30/01 10:30	DW
Nitrogen, Total Kjeldahl	351.2	0.77	J5	0.05	mg/L	7/28/01 13:34	DW
Total Dissolved Solids	160.1	6460	Q	5	mg/L	7/27/01 17:15	EC

Approved by:

Craig Toler/Lab Director
Laura Sullivan/QA Officer
Kathrine Bartkiewicz/Lab Supervisor

Comments:

Qualifier codes: Q-Sample analyzed beyond accepted hold time. J5-sample analyzed from an improperly preserved container.

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N0107525

Page ____ of ____

Client Youngquist.
Address
Phone Fax

Report To: Cameron Webster.
Bill To:
P.O. #
Project Name Pompano Beach
Project Location: Pompano WTP.

Sample Supply:
Customer Type:
Field Report #:
Kit #
REQUESTED DUE DATE: 7/30/01

Sampled By (PRINT) Largel
Sampler Signature

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL		ANALYSES REQUEST TDS	Chlorides	Conductivity	Ammonia	TKN							Sample ID #
1	Packer Test 6 (1519-1550) IW-1	7/19/01		G	X						X	X	X	X	X							01A | 01B

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				H&S	7/27/01	1200		7/27/01	1200
					7/27/01	1540	Cynthia Thomp.	7/27/01	1520

COMMENTS:
PER CAMERON –
RUN TDS OUT OF HOLD
AND NH_3 & TKN
UNPRESERVED
7/27/01 CET

COOLER #

COOLER SEAL INTACT
Yes No

Page: 1 of 1

Client Project: Pompano Beach
Lab Project: N0107040
Report Date: 07/03/01

Sanders Laboratories
Environmental Testing Services

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

ab ID	Sample Description	Sample Source	Sample Date/Time
107040-01	packer #4 1861'-1877' grab	Ground Water	6/29/01 10:00

alysis	Method	Results	Qual	Detection Limit	Units	AnalysisDate/Time	Analyst
monia-N	350.3	4.02		0.05	mg/L	7/3/01 12:15	NL
bride	300.0	9840		15	mg/L	7/3/01 9:50	DW
Conductivity	120.1	32000		0.1	umhos/cm	7/3/01 12:50	DW
ogen, Total ldahl	351.2	4.97		0.25	mg/L	7/3/01 18:41	NL
Total Dissolved Solids	160.1	20200		5	mg/L	7/2/01 17:30	CC

Approved by:

Craig Toler
Laboratory Director

Comments:

Final Report

Sanders Laboratories
Environmental Testing Services

CHAIN-OF-CUSTODY RECORD

PROJECT # N0107640

Page ______ of ______

Client: YBI
Address:
Phone: Fax:

Report To:
Bill To:
P.O. #:
Project Name: Packers
Project Location: Pompano 4 ~~[illegible]~~

Sample Supply: GW
Customer Type:
Field Report #:
Kit #:
REQUESTED DUE DATE: 7/4/01

Sampled By (PRINT): Cameron Webster
Sampler Signature: Cam Web

Bottle #	SAMPLE DESCRIPTION	Sample DATE	Sample TIME	Sample TYPE	PRESERVATIVES 4°C	UNPRESERVED	H_2SO_4	HNO_3	HCL	ANALYSES REQUEST TDS	Chlorides	Conductivity	NH3	TKN	Sample ID #
1	Packer # 4 1861-1877'	6-29	10am	6	1					X	X	X	X	X	01A/01B
	~~" " (dup)~~ RC	~~"~~	~~"~~	~~"~~	~~1~~					~~X~~	~~X~~	~~X~~	~~X~~	~~X~~ RC	

Bottle Lot #	OUT / DATE	SHIPMENT METHOD RETURNED / DATE	VIA	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
			pick-up	Cam Web	7-2-01	1320		7-2-01	1320
					7-2-01	1645		7/2/01	1645

COMMENTS:
Report
Faxed to
Beth & Ed McC
Nis 4B

COOLER #

COOLER SEAL INTACT
Yes No

07/03/01 @ 1920

1050 Endeavor Ct., Nokomis, Fl 34975-3693 • (941)488-8103 • FAX 484-6774
16800 Gator Road, Fort Myers, Fl 33919 • (941) 590-0337 • FAX (941) 590-0536

SEVERN
TRENT
SERVICES
STL Miami

YOUNGQ002775
Cameron Webster
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
May 29, 2002
Submission # 106001523
Order # 189709
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Pompano Beach
GW Testing

Sample I.D.: YB1 #5 1861 - 1877
Collected: 06/29/01 09:00
Received: 06/29/01 10:13
Collected by: Cameron Webster

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	42100	umhos	120.1	1.0	06/29/2001	06/29/2001	MC
Residue, Total Filterable (TDS)	20374	mg/L	SM2540C (160.1)	1.0	06/29/2001	07/01/2001	SMF/IV
Chloride	9850	mg/L	300.0	1.0	06/29/2001	06/29/2001	MC
Nitrogen (Ammonia)	3.02	mg/L	350.1	0.04	06/29/2001	06/29/2001	KK
Nitrogen (Kjeldahl)	4.60	mg/L	351.2	0.1	06/29/2001	06/29/2001	KK

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effected Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:Al.=#41180, Ct.=#PH0217, Ks.=#E270 + E1245, Ky.=#90087, La.=#9601, Md.=#271, Ma.=#M-FL535
ND.=#R163, OK.=#9523, SC.=#96023, Tn.=#TN02826

Maria E. Castellano
Authorized Laboratory Management
Laboratory Manager

Submission Code: 01/06-1523
[illegible]: 1897093
Entered Initials: [illegible]

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

ZF

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No. ______
Page: 1 of 1
Sampling CompQAP No.) ______
Approval Date: ______

Report To: Youngquist Brothers Inc
Report To Address: 15465 Pine Ridge Rd.
Bill To: " "
Billing Address: Ft. Myers FL 33908
Project Number/Name: GW Testing.
Site Location: Pompano Beach
Project Contact: Cameron Webster
Phone: (941) 960-4340
FAX: (954) 783-6795
Alternate Contact:
Phone:
FAX:
Sampled By (print): CAMERON WEBSTER
Sampler's Signature:

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH FLD	TEMP °C FLD	COND FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	TDS, Conductivity, NH3,	Chloride, TKN.					Lot number of Sampling Containers Used
1	YBI #5	6/29	9:00				GW		6	✓	✓					
2																
3																
4																
5																
6																
7																
8																
9																
10																

ANALYSIS REQUIRED: PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW (✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received: Temp 25 °C Sealed Yes [✓ No]

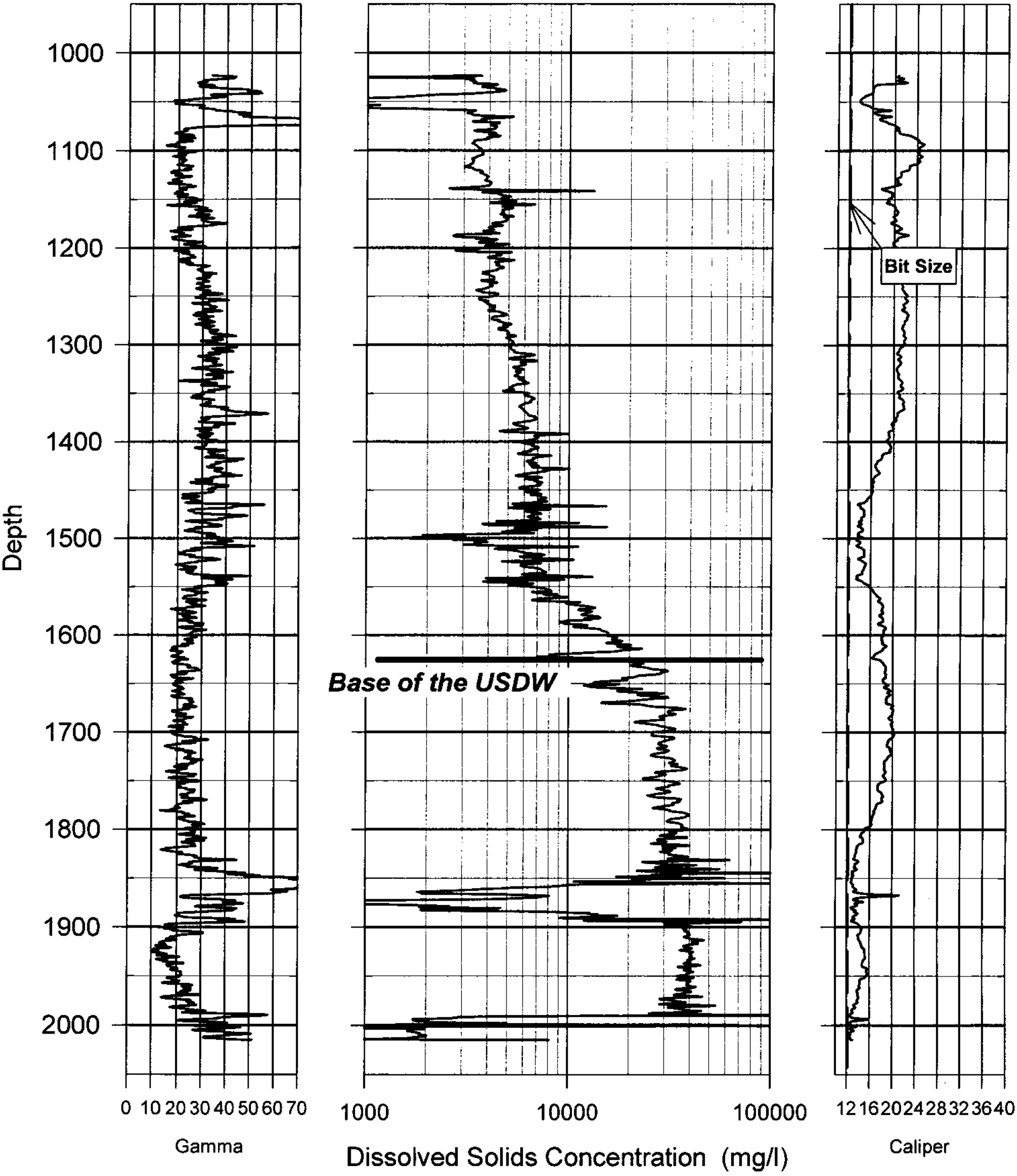
Special Comments:
Total # of Containers: 6
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: X Jake Black	Date: 6-29-01	(2) Relinquished by Signature:	Date:	DUE DATE REQUESTED T-7543 Confirmation #	
Company:	Time: 7:13	Company:	Time:	Coating Code: Due 6/29/01 Q/L/D	
(1) Received by Signature:	Date: 6/29/01	(2) Received by Signature:	Date:	Misc. Charges	
Company: SL	Time: 7:13	Company:	Time:	SHADED AREAS ARE FOR LAB USE ONLY	

APPENDIX J

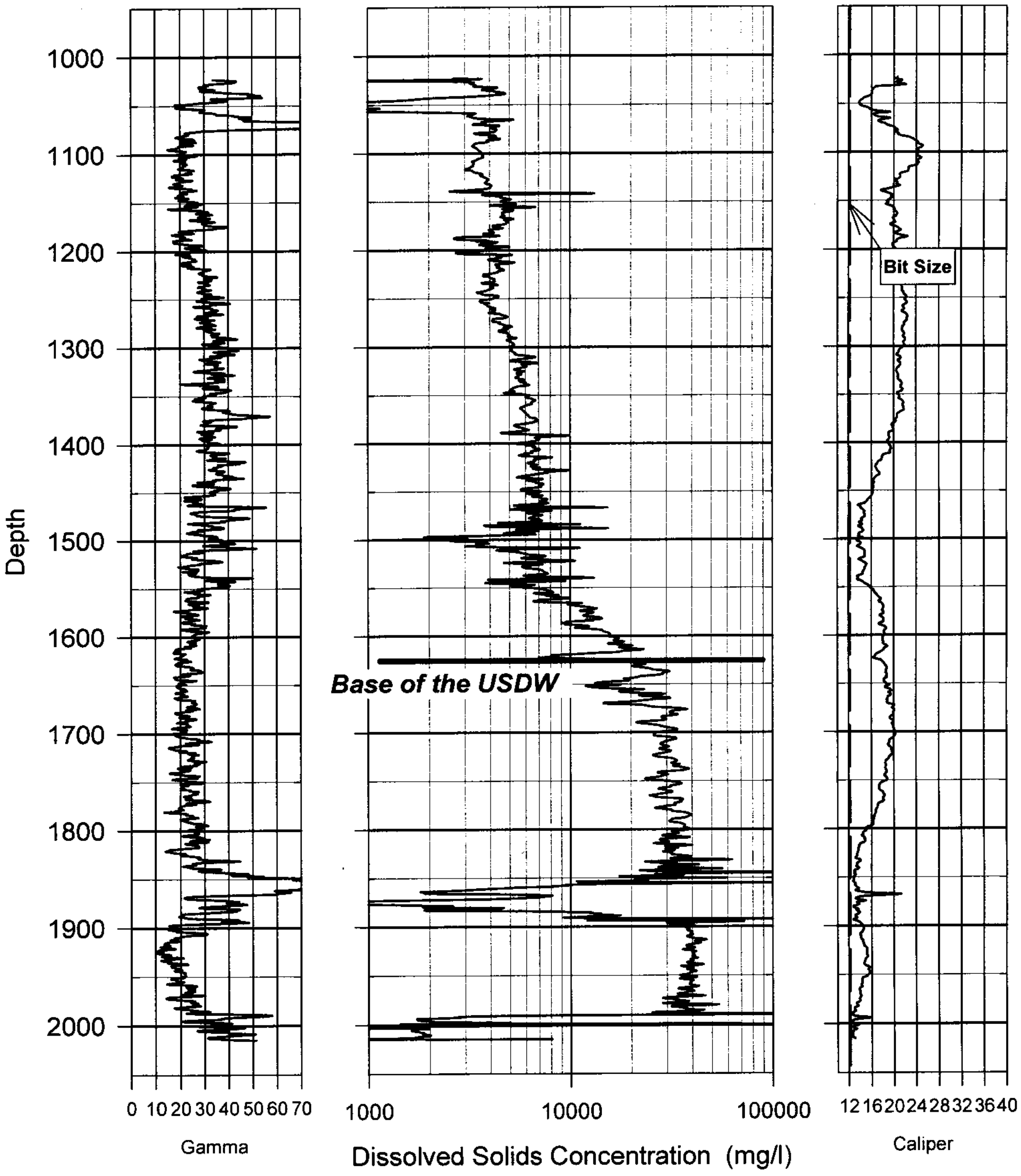
LOG DERIVED WATER QUALITY

Pompano Beach - Concentrate Disposal Well #1
Log Derived Water Quality



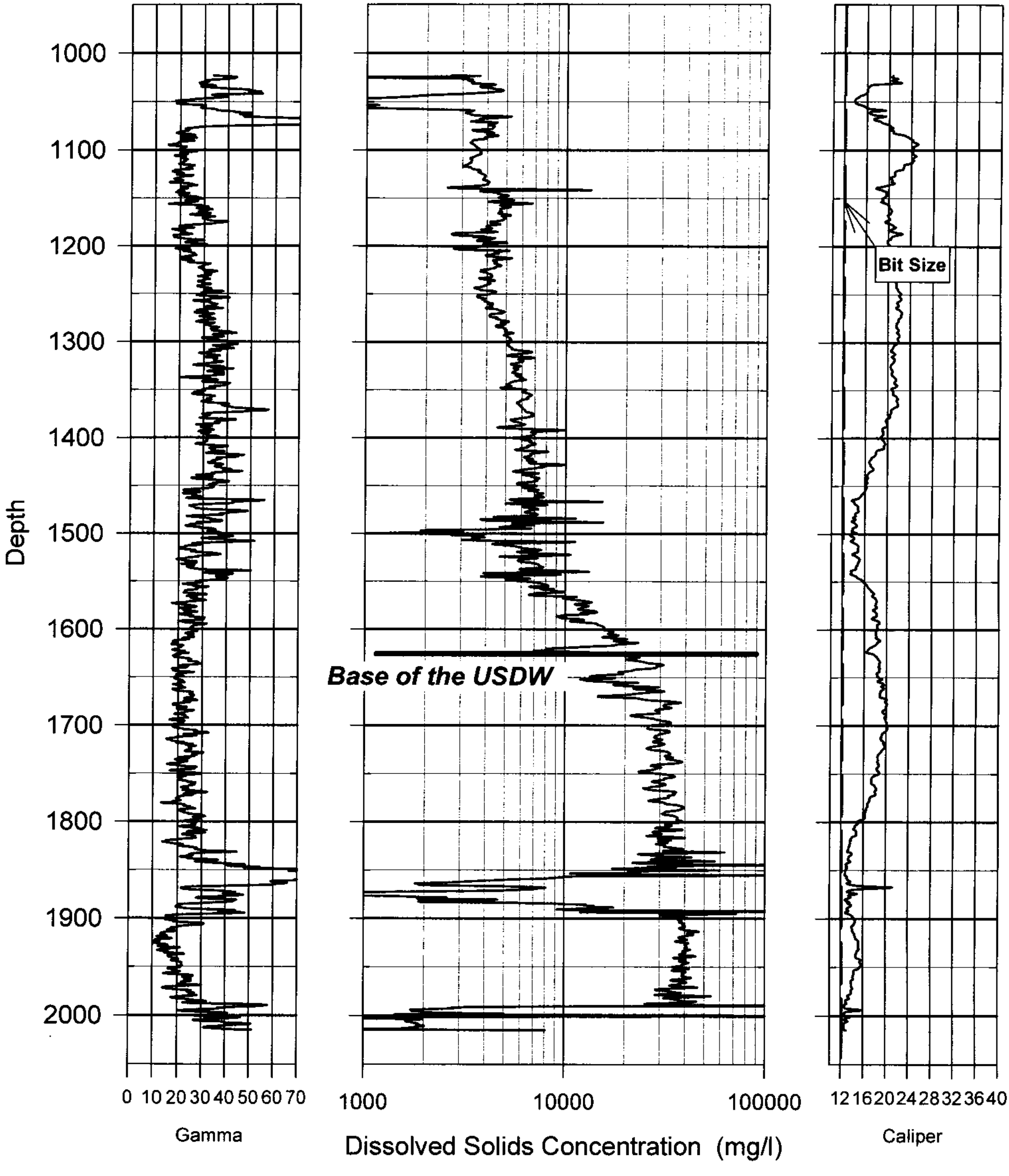
Used Best fit (a and m) values (R-H, m=2.0, a=1.0) non-Corrected Rt

Pompano Beach - Concentrate Disposal Well #1
Log Derived Water Quality



Used Best fit (a and m) values (R-H, m=2.0, a=1.0) non-Corrected Rt

Pompano Beach - Concentrate Disposal Well #1
Log Derived Water Quality



Used Best fit (a and m) values (R-H, m=2.0, a=1.0) non-Corrected Rt

APPENDIX K

CASING AND TUBING MILL CERTIFICATES

Injection Well Mill Certificates

Mill Certificates
IW–1
50–inch Diameter Casing

TELEPHONE: (416) 252-1113
FAX: (416) 259-6951

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF [illegible] ONTARIO LIMITED
289 HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 6Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE May 15/01

SPECIFICATION A139B

DIA. & WALL 50" O D X 375 WT

HYDROTEST 420 PSI FOR 1 Min.

CUSTOMER

CUSTOMER'S P.O. 6631

PHOENIX REF.# 01-3646

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST YIELD	LONGITUDINAL TEST TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
2843T	4	51300	75600	37.5	78700	PM
2840T	2	50600	74300	37.5	77600	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
2843T	.17	.88	.005	.007	.24	.03	.01	.02	.01	.036
2840T	.18	.80	.003	.007	.21	.01	.01	.01	.01	.033

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

Mill Certificates
IW–1
42–inch Diameter Casing

TELEPHONE: (416) 259-1113
FAX: (416) 259-6951

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE May 15/01

CUSTOMER Pipe & Piling Supplies

SPECIFICATION A139B

CUSTOMER'S P.O 6631

DIA. & WALL 42" O.D. X .375 WT

PHOENIX REF.# 01-3646

HYDROTEST 500 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST		% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
		YIELD	TENSILE			
8063M	3	54600	79900	37.5	83100	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
8063M	.17	.88	.005	.010	.22	.01	.01	.01	---	.034

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

TELEPHONE: (416) [illegible]-1119
FAX: (416) [illegible]

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 10[illegible]1 ONTARIO LIMITED
[illegible] HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE May 15/01

CUSTOMER

SPECIFICATION A139B

CUSTOMER'S P.O 6631

DIA. & WALL 42" O.D. X .375 WT

PHOENIX REF.# 01-3646

HYDROTEST 500 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO	PIPE NO.	LONGITUDINAL TEST YIELD	LONGITUDINAL TEST TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
8063M	3	54600	79900	37.5	83100	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
8053M	.17	.88	.005	.010	.22	.01	.01	.01	---	.034

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

TELEPHONE: (416) [illegible]-1113
FAX: (416) [illegible]

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF [illegible] ONTARIO LIMITED
[illegible] HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE May 15/01

CUSTOMER

SPECIFICATION A139B

CUSTOMER'S P.O. 6631

DIA. & WALL 42" O.D. X .375 WT

PHOENIX REF.# 01-3646

HYDROTEST 500 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST YIELD	LONGITUDINAL TEST TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
8063M	3	54600	79900	37.5	83100	PM
2605T	2	52700	78600	37.5	81900	PM
2843T	7	53900	80100	37.5	83500	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
8063M	.17	.88	.005	.010	.22	.01	.01	.01	---	.034
2605T	.17	.86	.005	.011	.23	.01	.01	.01	.01	.035
2843T	.17	.88	.005	.007	.24	.03	.01	.02	.01	.036

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

Mill Certificates
IW–1
34–inch Diameter Casing

TELEPHONE: (416) 259-1113
FAX: (416) 259-6951

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE June 4/01

CUSTOMER Pipe & Piling Supplies

SPECIFICATION A139B

CUSTOMER'S P.O 6631

DIA. & WALL 34" O.D. X .375 WT

PHOENIX REF.# 01-3696

HYDROTEST 620 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST		% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
		YIELD	TENSILE			
2844T	9	53400	78600	37.5	81900	PM
2605T	11	52600	78300	37.5	81700	PM
2604T	18	51500	75500	37.5	79100	PM
2840T	23	50800	74600	37.5	77900	PM
2842T	29	53100	78700	37.5	81900	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
2844T	.18	.87	.004	.007	.23	.02	.01	.01	.01	.042
2605T	.17	.86	.005	.011	.23	.01	.01	.01	.01	.035
2604T	.17	.83	.006	.011	.22	.01	.01	.01	.01	.036
2840T	.18	.80	.003	.007	.21	.01	.01	.01	.01	.033
2842T	.18	.86	.004	.006	.23	.02	.01	.01	.01	.035

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

Mill Certificates
IW–1
24–inch Diameter Casing

DATE: 07/
TIME: 08:20:17 USX™

USS
U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.	
DR10368 08		6800-USS		

SOLD TO ADDRESS

MAIL TO ADDRESS

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-×41ST EDITION DTD 4/1/95 ASTM A53-×99B ASTM A106-×99 GRADE B TRIPLE STENCIL ASME SA53-×1998 EDITION 1999 ADDENDUM ASME SA106-×1998 EDITION 1999 ADDENDUM GRADE B BLK REG MILL COAT PE BEV 30 DEG

MATERIAL COND: AS ROLLED
OD: 24.000(609.600) in (mm)
WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	TENSILE TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH	YIELD PSI	EXT % .50	TENSILE PSI	Y/T	ELONG % (IN 2")	HARDNESS SCALE: HRB	MIN HYDRO PSI	DWELL (SEC)
			IN	MIN: 35000		MIN: 60000	MAX:	MIN: 29.5	MIN:	800	5
				MAX:		MAX:			MAX: 100.0		
805990	STRIP/T/B	AR	1.500	43300	.50	72500	0.60	44.0	B 76.3	800	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL, U - UPSET, T - TRANSVERSE, N - NORMALIZED, QT - QUENCHED & TEMPERED, SR - STRESS RELIEVED, AR - AS ROLLED, B - BODY, W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				C.E.* MAX .50
805990	HEAT		17	103	009	008	23	02	02	07	01	037		003			001					.36
805990	PROD		20	104	010	008	23	02	02	07	01	041		001			002					.39
805990	PROD		20	103	010	007	22	02	02	07	01	039		001			000					.39

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S): CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

DATE: 07/25/00
TIME: 08:20:17 USX™

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U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR10368 08		6800-USS	

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	CHARPY V-NOTCH IMPACT TESTING												
					DIR	TEST LOC	TEMP	SIZE	TEST COND.	FT-LBS				% SHEAR			
										1	2	3	AVG	1	2	3	AVG
							DEG										
B05990	OK		** END OF DATA THIS SHEET **														

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L X L/T ____ 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: J. MASSIMINO MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 07/25/00

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 02/24/00
TIME: 13:52:57 USX

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MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.
0R06932 02		6599-USS	

SOLD TO ADDRESS

MAIL TO ADDRESS

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-X41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-X98 ASTM A106-X97A GRADE B QUAD STENCIL ASME SA53-X1998 EDITION 1999 ADDENDUM GRADE B BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH IN	YIELD PSI	EXT % .50	TENSILE PSI	Y/T	ELONG % IN 2"	HARDNESS SCALE: HRB	MIN HYDRO PSI	DWELL (SEC)
				MIN: 42000 MAX:		MIN: 60000 MAX:	MAX:	MIN 29.5	MIN: MAX: 100.0	1500	5
A03678	STRIP/T/B	AR	1.500	44200	.50	70500	0.56	41.0	B 79.0	1500	5
A83933	STRIP/T/B	AR	1.500	48900	.50	81000	0.60	39.0	B 79.0	1500	5
			** END OF DATA THIS SHEET **								

LEGEND: L - LONGITUDINAL U - UPSET T - TRANSVERSE N - NORMALIZED QT - QUENCHED & TEMPERED SR - STRESS RELIEVED AR - AS ROLLED B - BODY W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				CE* MAX .50
A83678	HEAT		24	85	007	007	24	02	02	06	02	027		003			001					.40
A83678	PROD		23	86	007	007	24	02	02	06	02	031		001			001					.39
A83678	PROD		25	86	007	007	24	02	02	06	02	031		001			001					.42
A83933	HEAT		25	86	010	007	26	02	02	06	01	025		003			001					.41
A83933	PROD		25	88	010	009	26	02	02	06	01	031		001			000					.42
A83933	PROD		25	88	010	009	26	02	02	06	01	032		001			000					.42
				** END OF DATA THIS SHEET **																		

*C.E. IS BASED ON THE FOLLOWING EQUATION(S): CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 02/24/00
TIME: 13:52:57 USX

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MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR06932 02		6599-USS	

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	CHARPY V-NOTCH IMPACT TESTING												
					DIR	TEST LOC.	TEMP	SIZE	TEST COND.	FT-LBS				% SHEAR			
										1	2	3	AVG	1	2	3	AVG
							DEG F										
A03678	OK																
A03933	OK																

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X , OD/ID ____ L X L/T ____ 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: J. MASSIMINO MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 02/24/00

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 03/13/00
TIME: 10:45:43 USX™

USA USS, USX are trademarks of USX Corporation

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR08851 01		6717-USS	

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	CHARPY V-NOTCH IMPACT TESTING DIR	TEST LOC	TEMP	SIZE	TEST COND.	FT-LBS 1	FT-LBS 2	FT-LBS 3	FT-LBS AVG	% SHEAR 1	% SHEAR 2	% SHEAR 3	% SHEAR AVG
							DEG F										
A83674	OK																
A83675	OK																

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L X L/T ____ 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF: J. MASSIMINO MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 03/13/00

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 03/13/00
TIME: 10:45:43 USX™

USS, USX, USX are trademarks of USX Corporation

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.	
DR08851 01		6717-USS		

SOLD TO ADDRESS

MAIL TO ADDRESS

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-*41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-*99B ASTM A106-*99 GRADE B QUAD STENCIL ASME SA53-*1998 EDITION 1999 ADDENDUM ASME SA106-*1998 EDITION 1999 ADDENDUM GRADE B BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH IN	YIELD PSI	EXT % .50	TENSILE PSI	Y/T	ELONG % IN 2"	HARDNESS SCALE: HRB	MIN HYDRO PSI	DWELL (SEC)
				MIN: 42000 MAX:		MIN: 60000 MAX:	MAX:	MIN: 29.5	MIN: MAX: 100.0	1500	5
A83676	STRIP/T/B	AR	1.500	46600	.50	80000	0.58	41.0	B 78.0	1500	5
A83680	STRIP/T/B	AR	1.500	48900	.50	78500	0.62	41.0	B 77.7	1500	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL; U - UPSET; T - TRANSVERSE; N - NORMALIZED; QT - QUENCHED & TEMPERED; SR - STRESS RELIEVED; AR - AS ROLLED; B - BODY; W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				C.E.* MAX .50
A83676	HEAT		24	88	008	004	24	02	02	07	02	026		003			001					.41
A83676	PROD		26	89	008	010	26	02	02	06	02	033		001			002					.43
A83676	PROD		27	90	008	004	26	02	02	07	02	032		002			002					.44
A83680	HEAT		23	88	006	007	24	02	03	05	02	027		003			001					.40
A83680	PROD		23	87	006	007	25	02	02	05	02	033		001			001					.39
A83680	PROD		23	89	006	009	25	02	02	05	02	032		001			001					.40

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S): CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

Commodity: SEAMLESS CARBON STEEL PIPE

MILL TEST REPORTS

EN 10204/3.1.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: 2000097B5
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B
Date: FEB.15.2001

LOT2

Total: 45 Pcs., 511.48 m, 95615 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0083305	24"x0.500"xDRL	16	180.47	33739	611010264 A	350	480	41	G			G		0.19	0.22	0.44	0.020	0.015	0.02	0.04	0.01	0.08	0.0
					611010264 B	345	475	42															
0083315	24"x0.500"xDRL	15	170.58	31888	611010263 A	340	470	41	G			G		0.19	0.23	0.50	0.026	0.014	0.02	0.04	0.01	0.07	0.0
					611010263 B	340	475	42															
0083323	24"x0.500"xDRL	14	160.43	29988	631020029 A	365	485	43	G			G		0.18	0.24	0.50	0.007	0.013	0.01	0.03	0.01	0.05	0.01
					631020029 B	380	495	43															

VASS pipe

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G---------------Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 03/08/00
TIME: 10:43:04

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MILL ORDER/ITEM NO.	SHIPPER NO.	P.O. NUMBER	VEHICLE I.D.	
0R0885) 01		6717-USS		

SOLD TO ADDRESS

MAIL TO ADDRESS

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-X41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-X998 ASTM A106-X99 GRADE B QUAD STENCIL ASME SA53-X1998 EDITION 1999 ADDENDUM ASME SA106-X1998 EDITION 1999 ADDENDUM GRADE B BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND: AS ROLLED

OD: 24.000(609.600) in (mm) WALL: 0.500 (12.700)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH IN	YIELD PSI	EXT % .50	TENSILE PSI	Y/T	ELONG % IN 2"	HARDNESS SCALE HRB	MIN HYDRO PSI
				MIN 42000 MAX		MIN 60000 MAX	MAX	MIN 29.5	MIN MAX 100.0	1500
AB3676	STRIP/T/B	AR	1.500	46600	.50	80000	0.58	41.0	B 78.0	1500
B88S82	STRIP/T/B	AR	1.500	47100	.50	81500	0.58	40.0	B 78.0	1500
		**	END OF DATA THIS	SHEET	**					

LEGEND: L - LONGITUDINAL; U - UPSET; T - TRANSVERSE; N - NORMALIZED; QT - QUENCHED & TEMPERED; SR - STRESS RELIEVED; AR - AS ROLLED; B - BODY; W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO			
AB3676	HEAT		24	88	008	004	24	02	02	07	02	026		003			001				
AB3676	PROD		26	89	008	010	26	02	02	06	02	035		001			002				
AB3676	PROD		27	90	008	004	26	02	02	07	02	032		002			002				
B88S82	HEAT		25	86	011	009	24	02	02	06	01	025		003			001				
B88S82	PROD		28	87	010	010	25	02	02	07	01	033		001			000				
B88S82	PROD		27	87	011	010	25	02	02	06	01	032		001			000				
				** END OF	DATA	THIS	SHEET	**													

*C.E. IS BASED ON THE FOLLOWING EQUATION(S): CE=C+(MN/6)+(CR+MO+V)/5+(NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

DATE: 03/13/00
TIME: 10:45:43 USX™

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U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.
DR00051 01		6717-USS	

SOLD TO ADDRESS

MAIL TO ADDRESS

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-×41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-×99B ASTM A106-×99 GRADE B QUAD STENCIL ASME SA53-×1998 EDITION 1999 ADDENDUM ASME SA106-×1998 EDITION 1999 ADDENDUM GRADE B BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH IN	YIELD PSI	EXT % .50	TENSILE PSI	Y/T	ELONG % (IN 2")	HARDNESS SCALE: HRB	MIN HYDRO PSI	WALL (REQ)
				MIN: 42000 MAX:		MIN: 60000 MAX:	MAX:	MIN: 29.5	MIN: MAX: 100.0	1500	5
A83676	STRIP/T/B	AR	1.500	46600	.50	80000	0.58	41.0	B 78.0	1500	5
A83680	STRIP/T/B	AR	1.500	48900	.50	78500	0.62	41.0	B 77.7	1500	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL; U - UPSET; T - TRANSVERSE; N - NORMALIZED; QT - QUENCHED & TEMPERED; SR - STRESS RELIEVED; AR - AS ROLLED; B - BODY; W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				C.E.* MAX .50
A83676	HEAT		24	88	008	004	24	02	02	07	02	026		003			001					.41
A83676	PROD		26	89	008	010	26	02	02	06	02	033		001			002					.43
A83676	PROD		27	90	008	004	26	02	02	07	02	032		002			002					.44
A83680	HEAT		23	88	006	007	24	02	03	05	02	027		003			001					.40
A83680	PROD		23	87	006	007	25	02	02	05	02	033		001			001					.39
A83680	PROD		23	89	006	009	25	02	02	05	02	032		001			001					.40

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S): CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

Mill Certificates
IW–1
16–inch Diameter Tubing

MILL CERTIFICATE

CONTRACT No. : 3714000/MIX2000-019

CUSTOMER :

L/C No. :

OBJECT : Seamless Steel Line Pipes

PANGANG GROUP [illegible] STEEL TUBE CO., LTD.

SHIPPING MARK : HOUSTON

CERTIFICATE No. : 200070009

STANDARD: API 5L/ASTM A106/A53/ASME SA106/SA53/NACE MR-0175

GRADE : X42/B

TOTAL: 60 PACKAGES, 60 PCS., 731.52 m, 90180 Kg

HEAT No.	SIZE	QUANTITY				TEST PIECE No.	MECHANICAL PROPERTIES			WORKMANSHIP TEST		CHEMICAL COMPOSITION (%)									
		PACKAGES	PCS.	m	Kg		Y.S (PSI)	T.S (PSI)	EL (%)	1.	4	C	Si	Mn	S	P	RESIDUAL ELEMENTS				
																	Cr	Ni	Mo	Cu	V
0070307	16" x 0.500" x 40'	10	10	121.92	15030	220070289 A B	53000 50000	72000 73000	40.0 40.0	G	2230	0.13	0.52	1.13	0.006	0.019	0.04	0.05	0.010	0.030	0.01
0080665	16" x 0.500" x 40'	50	50	609.60	75150	210070294 A B	51000 51000	78000 77000	43.0 44.0	G	2230	0.14	0.42	1.17	0.015	0.018	0.05	0.04	0.010	0.060	0.01

70307 →

80665 →

NOTES:

1. FLATTEN TEST
2. BENDING TEST
3. FLARING TEST
4. HYDROSTATIC TEST(PSI)

REMARK:

1. CONDITION OF SUPPLY: HOT-ROLLED
2. TUBE DELIVERED IN THEORETICAL WEIGHT
3. G——GOOD

INSPECTOR:

CONSIGNOR:

DATE: 2001.7.22

Heat Nos. 80665/70307

Commodity: <u>SEAMLESS CARBON STEEL PIPE</u>

MILL TEST REPORTS

EN 10204/3.1.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: <u>2000097B2</u>
Standard: <u>ASTM A53/ASME SA53/</u>
<u>ASTM A106/ASME SA106/API 5L</u>
Grade: <u>B</u>
Date: <u>FEB.15.2001</u>

LOT2

Total: 33 Pcs., 402.34 m, 49599 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Tes					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
015376	16"x0.500"xDRL	33	402.34	49599	231020457 A	320	470	45	G			G		0.20	0.23	0.54	0.012	0.016	0.02	0.04	0.01	0.08	0.02
					231020457 B	330	465	46															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G—————Good
5. The weight is net weight

Inspector: <u>Cheng Yu</u>

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

Heat No 15376

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-11-A
Transmittal No. # 05 **Date:** 8/7/01
Signature MT

MILL CERTIFICATE

PANGANG GROUP CHENGDU SEAMLESS STEEL TUBE CO., LTD.

CONTRACT № : 3774000/HYX2000-079
CUSTOMER :
L/C № :
OBJECT : Seamless Steel Line Pipes

SHIPPING MARK : HOUSTON
CERTIFICATE № : 200079009
STANDARD:API 5L/ASTM A106/A53/ASME SA106/SA53/NACE MR-0175
GRADE : X42/B

TOTAL: 60 PACKAGES, 60 PCS., 731.52 m, 90180 Kg

✓ HEAT №	SIZE	QUANTITY				TEST PIECE №	MACHANICAL PROPERTIES			WORKMANSHIP TEST		CHEMICAL COMPOSITION (%)									
																	RESIDUAL ELEMENTS				
		PACKAGES	PCS.	m	Kg		Y.S (PSI)	T.S (PSI)	EL. (%)	1	4	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0081552	16" x 0.500" x 40'	10	10	121.92	15030	220070299 A	53000	72000	40.0	G	2230	0.13	0.52	1.13	0.006	0.019	0.04	0.04	0.010	0.070	0.01
						B	50000	73000	46.0												
S0120081	16" x 0.500" x 40'	50	50	609.60	75150	210070294 A	51000	78000	43.0	G	2230	0.14	0.42	1.17	0.019	0.018	0.06	0.04	0.010	0.060	0.01
						B	51000	77000	44.0												

NOTES:

1. FLATTEN TEST
2. BENDING TEST
3. FLARING TEST
4. HYDROSTATIC TEST(PSI)

REMARK:

1. CONDITION OF SUPPLY : HOT-ROLLED
2. TUBE DELIVERRED IN THEORETICAL WEIGHT
3. G---GOOD

INSPECTOR:

CONSIGNOR:

DATE: 2000.8.22

Heat No. 81552

Železárny Chomutov a. s. závod Válcovny trub

Inspekční certifikát – Abnahmeprüfzeugnis – Inspection Certificate – Certificat de Réception

MILL TEST CERTIFICATE
DIN 50049/3.1 B
EN 10204/3.1 B

Atest č. – Attest Nr. – Certificate No – Certificat N°: 1521/01

Objednávka č. – Bestell Nr. – Order No – N° de la commande:
3778300
Code: 00/42/282

H-A-31.3

Zákazník – Besteller – Customer – Client:

Zakázka č. – Bestell Nr. – Order No – Commande N°: 11/38-835716-1

Ocelové bezešvé trubky – Nahtlose Stahlrohre – Seamless steel tubes – Tubes en aciers sans soudure

Test pressure

Technické požadavky – Prüfgrundlagen/Anforderungen – Technical requirements/Demand – Exigences techniques:

ASTM A 53/ A53M-99b ASME SA 53 API 5L - 00 PSL 1
ASTM A 106 - 99 ASME SA 106 - 98

Materiál – Werkstoff – Materiál – Matière:	Dle – Entsprechend – According to – Selon:	Vydání – Ausgabe – Edition – Edition:
Grade B	ASTM A 53	1999
Grade B	ASTM A 106	1999
Grade B	ASME SA 106	1998
Grade B/X42 PSL 1	API 5L	2000

Stav dodávky – Lieferzustand – State of delivery – Etat de livraison:
Hot rolled

Způsob zpracování tavby – Erschmelzungsart – Melting process – Procédé d'élaboration:
electric steel

Seamless steel pipes acc.to API 5L-00/Gr.B/X42 PSL 1,ASTM A-53/A53M-99b,Gr.B/ASME SA, Gr.B,ASTM A106-99,Gr.B/ASME SA 106,Gr.B Lacguer,beveled ends,lengths:11,3-13,1m (37-43 ft)

Značení – Kennzeichnung – Marking – Marquage:

VT-Czech Rep. 5L 0286 API, 2.2001;
API 5L; B/X42,ASME SA 106B/SA 53B,
16" Sch40,S,Heat No,Tested 2230 PSI,
82,77 LBS/FT, Vass Pipe P.O.9517 NJ

Razítko znalce – Stempel des Sachverständigen – Inspector's stamp – Poincon de l'expert: TK

Znak výrobce – Herstellerzeichen – Brand of the manufacturer – Marque du fabricant: VT

Rozsah dodávky – Umfang der Lieferung – Extent of material delivery – Liste descriptive

Skupina Los Lot Lot	Kusy Stücke Pieces Pièces	Celková délka Gesamtlänge Total length Longueur totale ft	Celková hmotnost Gesamtmasse Total mass Masse totale t	Rozměry Dimensionen Dimensions Dimensions [mm]	Tavba číslo Schmelze Nr. Heat No N° Coulée	Vodní tlak Druckprobe Hydr. test Essai hydraulique psi
	10	384.84	14.900	0 406.4 x 12.70 16"x 0.500" / Length 37-43 ft/	31198	2230 5 sec.

Doplňující údaje – Zusätzliche Angaben – Additional remarks – Autres remarques:

Aviso: 550496
Mercury Free and No Weld Repair.
Visual inspection and dimensional check without objection.

Výsledky zkoušek uvedených v příloze odpovídají sjednaným podmínkám – Die bestellten Anforderungen sind lt. Anlagen erfüllt – The requirements are fulfilled as per Annex – Les conditions indiquées dans l'annexe sont satisfaisant

Chomutov P. 7.5.2001
Dne – Datum – Date – Date

Železárny Chomutov a.s.
Chomutov, Beethovenova 1269/53
④ DIČ: 183-46708715
závod Válcovny trub
Chomutov, Libušina 4278

Zodpovědná osoba – Der Werkssachverständige – Inspector – Le responsable

Schmidová Miroslava

Příloha – Anlage – Annex – Annexe: 1
Výsledky zkoušek – Ergebnis der Prüfungen – Test results – Résultats des tests

Železárny Chomutov a.s. závod Válcovny trub

Příloha – Anlage – Annex – Annexe: 1

Výsledky zkoušek – Ergebnis der Prüfungen – Test results – Résultats des tests

Atest č. – Attest Nr. – Certificate No – Certificat N°: 1521/01

Ze dne – Vom – Dated – Date: 7.5.2001

Mechanické zkoušky – Mechanische Prüfungen – Mechanical tests – Tests mécaniques

Skupina Lot Los Lot	Číslo zkoušky Probe Nr. Test No N° du test	Číslo tavby Schmelze Nr. Heat No N° Coulée	Rozměr vzorku Probenabmessung Dim. of specimen Dim. de l'échantillon: Tloušťka Dicke Thickness Epaisseur	Šíře Ø Breite Ø Width Ø Largeur Ø	Odběr vzorku Probenentnahme Specimen Prélèvement: Směr Richtung Direction Direction	Zkuš. teplota Prüftemperatur Test temperature Température du test	Mez kluzu Streck/Dehngrenze Yield point/Proof stress Limite d'élasticité Rt 0.5	Pevnost v tahu Zugfestigkeit Tensile strength Résistance à la traction Rm	Tažnost Bruchdehnung Elongation Allongement 2"	Kontrakce Brucheinschnürung Reduction of area Contraction	Nárazová práce Schlagarbeit Energy of impact Energie de rupture	Vrub. houževnatost Kerbschlagzähigkeit Impact strength Résilience
			mm	"		°C	psi	psi	%	%	J	J.cm²
Requirements		:										
A 106	A 53	Gr.B		1	Q	20	35000	60000	16.5			
API	5L	Gr.B					35000	60000	27.0			
API	5L	X 42					42000	60000	27.0			
	15383	31198		1	Q	20	44515	70760	31.0			

Hardness test < 20 HRC

Technologické zkoušky – Technologische Prüfungen – Technological tests – Tests technologiques:

The flattening test satisfied.

Chemické složení – Chemische Zusammensetzung – Chemical composition – Composition chimique (%)

Tavba číslo Schmelze Nr. Heat No	heat analysis (S) / product analysis (K)											
	C	Mn	Si	P	S	Cr	Ni	Cu	Mo	V	Ti	Nb
Requirements :												
min. A 106		0.29	0.10									
max. A 53	0.30	1.35	-	0.035	0.035	0.40	0.40	0.40	0.15	0.08		
max. API 5L Gr.B	0.28	1.20		0.030	0.030							
max. API 5L X 42	0.28	1.30		0.030	0.030							
31198 S	0.18	0.76	0.26	0.013	0.011	0.12	0.04	0.12	0.02	0.000	0.002	0.002
31198 K	0.18	0.75		0.011	0.012							
31198 K	0.17	0.75		0.011	0.011							

L – Podél – Längs – Along – En longueur; Q – Příčně – Quer – Travers – En travers

Železárny Chomutov a.s.
Chomutov, [illegible]
④ DIČ: [illegible]
závod Válcovny trub
Chomutov, [illegible] 4773

Chomutov B. 7.5.2001

Heat No. 31198

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 09/17/99
TIME: 09:18:49 USX™

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR03525 05		97972-0	

MATERIAL COND: AS ROLLED

O.D.: 16.000(406.400) In (mm)

WALL: 0.500 (12.700) In (mm)

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	CHARPY V-NOTCH IMPACT TESTING DIR	TEST LOC.	TEMP	SIZE	TEST COND.	FT-LBS 1	2	3	AVG	% SHEAR 1	2	3	AVG
							DEG										
AB2671	OK		** END OF DATA THIS SHEET **														

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L ____ L/T X 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-07-A
Transmittal No. # 04 Date: 7/18/07
Signature MF

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF:
F.J. MIKULSKI MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 09/17/99

Heat No. 02611

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

TIME: 09:18:44 USX™

USS, USM, USX are trademarks of USX Corporation

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.
OR03525 05		97972-0	

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-X41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-X98 ASTM A106-X97A GRADE B QUAD STENCIL ASME SA53-X1998 EDITION 1998 ADDENDUM ASME SA106-X1998 EDITION 1998 ADDENDUM GRADE B CARBON EQUIVALENT ON HEAT ANALYSIS .40 MAX BASED ON C+MN OVER 6 + (CR+MO+V) OVER 5 + (CU+NI) OVER 15 BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND: AS ROLLED

O.D.: 16.000(406.400) in (mm)

WALL: 0.500 (12.700) in (mm)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH	YIELD	EXT %	TENSILE	Y/T	ELONG % IN 1 DIA	HARDNESS SCALE:	MIN HYDRO	DWELL (SEC)
				MIN: PSI MAX: 42000	.50	MIN: PSI MAX: 60000	MAX:		MIN: HRB MAX.	PSI 2230	5
A82671	STRIP/T/B	AR	IN 1.500	46000	.50	73000	0.63	29.5 43.0	100.0 B 76.0	2230	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL U - UPSET T - TRANSVERSE N - NORMALIZED QT - QUENCHED & TEMPERED SR - STRESS RELIEVED AR - AS ROLLED B - BODY W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				CE*
																						MAX .40
A82671	HEAT		17	103	009	007	24	02	02	05	01	045		002			001					.36
A82671	PROD		20	103	008	006	23	02	02	05	01	046		000			001					.38
A82671	PROD		18	102	008	007	22	02	02	05	01	044		000			001					.37

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S):

CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

Heat No. 82671

Commodity: SEAMLESS CARBON STEEL PIPE

GROUP CHENGDU SEAMLESS STEEL TUBE CO.,LTD.

MILL TEST REPORTS

EN 10204/3.1.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: 2000097A
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B/X42

PO# 1947

LOT 1

Total:

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	
P0026363	12-3/4"x0.375"x40ft	2	24.38	1800	220120288 A	335	485	42	G			G		0.22	0.23	0.44	0.019	0.023	0.02	0.03	0.01	0.04	0.
					220120288 B	335	480	40															
0083246	8-5/8"x0.322"x40ft	104	1267.97	53950	130120048 A	375	515	38	G			G		0.20	0.27	0.53	0.013	0.011	0.01	0.05	0.01	0.09	0.
					130120048 B	375	525	39															
0083247	8-5/8"x0.322"x40ft	100	1219.20	51875	130120049 A	375	515	36	G			G		0.22	0.33	0.55	0.013	0.013	0.02	0.05	0.01	0.09	0.
					130120049 B	345	490	36															
0083307	6-5/8"x0.280"x40ft	65	792.48	22399	120120150 A	315	530	31	G			G		0.20	0.25	0.54	0.018	0.014	0.02	0.04	0.01	0.07	0.
					120120150 B	310	525	37															
0083308	6-5/8"x0.280"x40ft	175	2133.60	60305	120120148 A	325	525	33	G			G		0.22	0.24	0.54	0.013	0.016	0.02	0.05	0.01	0.07	0.
					120120148 B	330	540	40															
0083309	6-5/8"x0.432"x40ft	136	1658.11	70584	120120181 A	315	520	38	G			G		0.22	0.23	0.50	0.014	0.016	0.02	0.05	0.02	0.07	0.
					120120181 B	320	530	36															
0083265	10-3/4"x0.365"x40ft	60	731.52	44100	140120072 A	335	500	37	G			G		0.21	0.25	0.53	0.015	0.013	0.01	0.04	0.01	0.06	0.
					140120072 B	330	505	34															
0083253	8-5/8"x0.500"x40ft	57	694.94	44916	120120057 A	410	540	42	G			G		0.14	0.47	1.17	0.017	0.014	0.02	0.05	0.02	0.08	0.
					120120057 B	435	540	41															
0082725	14"x0.500"x40ft	37	451.10	48433	211010027 A	350	535	44	G			G		0.14	0.49	1.24	0.017	0.014	0.04	0.05	0.02	0.07	0.
					211010027 B	355	535	44															
0082757	14"x0.375"x40ft	50	609.60	49550	230110128 A	330	505	41	G			G		0.21	0.21	0.54	0.010	0.016	0.01	0.04	0.01	0.06	0
					230110128 B	350	500	36															
0083325	14"x0.375"x40ft	44	536.45	43604	241010024 A	335	495	40	G			G		0.21	0.24	0.54	0.014	0.013	0.02	0.04	0.01	0.08	0
					241010024 B	335	495	41															
0080632	12-3/4"x0.500"x40ft	28	341.38	33264	210120372 A	355	510	47	G			G		0.12	0.42	1.18	0.016	0.009	0.04	0.05	0.01	0.07	
					210120372 B	360	510	44															
0081927	12-3/4"x0.500"x40ft	50	609.60	59400	220120375 A	370	520	44	G			G		0.14	0.40	1.31	0.010	0.014	0.04	0.04	0.01	0.06	
					220120375 B	380	515	46															
0081552	16"x0.500"x40ft	50	609.60	75150	221010043 A	345	510	48	G			G		0.14	0.40	1.15	0.200	0.018	0.04	0.03	0.01	0.10	
					221010043 B	355	515	44															

Heat No. 81563

TUBE CO., LTD.

0081563	16"x0.500"x40ft	3	36.58	4509	221010042 A	370	525	47	G			G		0.16	0.45	1.16	0.012	0.017	0.02	0.04	0.01	0.07	0.01
					221010042 B	340	510	43															
S0021739	16"x0.375"x40ft	28	341.39	31808	610120112 A	375	495	36	G			G		0.19	0.22	0.48	0.024	0.026	0.02	0.04	0.01	0.09	0.01
					610120112 B	375	510	40															
S0021787	16"x0.375"x40ft	25	304.80	28400	610120110 A	380	530	40	G			G		0.18	0.26	0.54	0.017	0.017	0.01	0.04	0.01	0.12	0.01
					610120110 B	375	520	33															
S0021791	16"x0.375"x40ft	26	316.99	29536	630120106 A	385	515	40	G			G		0.21	0.24	0.58	0.019	0.021	0.03	0.12	0.01	0.14	0.01
					630120106 B	385	515	40															
S0021794	16"x0.375"x40ft	21	256.03	23856	610120117 A	395	520	36	G			G		0.22	0.27	0.60	0.011	0.022	0.05	0.08	0.01	0.11	0.01
					610120117 B	395	550	30															
P0015422	12-3/4"x0.375"x40ft	50	609.60	45000	220120289 A	330	480	40	G			G		0.21	0.27	0.50	0.011	0.020	0.02	0.02	0.01	0.04	0.0
					220120289 B	325	485	41															
P0016466	12-3/4"x0.375"x40ft	50	609.60	45000	220120291 A	325	480	41	G			G		0.19	0.22	0.51	0.021	0.015	0.04	0.04	0.01	0.03	0.0
					220120291 B	335	480	42															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G-------------Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-67-A
Transmittal No. # 016 **Date:** 8/28/01
Signature

SEAMLESS STEEL TUBE CO., LTD.

Heat No. 81563

Commodity: SEAMLESS CARBON STEEL PIPE

MILL TEST REPORTS

EN 10204/3.1.B.

Certificate No.: 2000097B2
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B
Date: FEB.15.2001

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

LOT2 Total: 33 Pcs., 402.34 m, 49599 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Tes					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
015376	16"x0.500"xDRL	33	402.34	49599	231020457 A	320	470	46	G			G		0.20	0.23	0.54	0.012	0.016	0.02	0.04	0.01	0.08	0.02
					231020457 B	330	465	46															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G---------------Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

Heat No. 81563

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DAT 09 '99
TIME: 09:18:44 USX™

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MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR03525 05		97972-0	

MATERIAL COND.: AS ROLLED

O.D.: 16.000(406.400) In (mm)

WALL: 0.500 (12.700) In (mm)

CHARPY V-NOTCH IMPACT TESTING

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MN COLLAPSE	DIR	TEST LOC.	TEMP	SIZE	TEST COND.	FT-LBS 1	FT-LBS 2	FT-LBS 3	FT-LBS AVG	% SHEAR 1	% SHEAR 2	% SHEAR 3	% SHEAR AVG
							DEG										
A82671	OK			** END OF DATA THIS SHEET **													

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L ____ L/T X 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-07-A
Transmittal No. # 04 Date: 2/18/07
Signature MF

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF:
F.J. MIKULSKI MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 09/17/99

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

TIME: 09:18:44 USX

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JUL 16 '01 10:47AM VASS PIPE

P.5

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.
DR03525 05		97972-D	

VENDOR
USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-X41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-X98 ASTM A106-X97A GRADE B QUAD STENCIL ASME SA53-X1998 EDITION 1998 ADDENDUM ASME SA106-X1998 EDITION 1998 ADDENDUM GRADE B CARBON EQUIVALENT ON HEAT ANALYSIS .40 MAX BASED ON C+MN OVER 6 + (CR+MO+V) OVER 5 + (CU+NI) OVER 15 BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND.: AS ROLLED

O.D.: 16.000(406.400) in (mm)

WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	TENSILE TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH	YIELD	EXT %	TENSILE	Y/T	ELONG % ON 1	HARDNESS SCALE:	MIN HYDRO	DWELL (SEC)
				MIN: PSI MAX: 42000	.50	MIN: PSI MAX: 60000	MAX:	MIN: 29.5	MIN: HRB MAX: 100.0	PSI 2230	5
A82671	STRIP/T/B	AR	IN 1.500	46000	.50	73000	0.63	43.0	B 76.0	2230	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL U - UPSET T - TRANSVERSE N - NORMALIZED QT - QUENCHED & TEMPERED SR - STRESS RELIEVED AR - AS ROLLED B - BODY W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				C.E.*
																						MAX .40
A82671	HEAT		17	103	009	007	24	02	02	05	01	045		002			001					.36
A82671	PROD		20	103	008	006	23	02	02	05	01	046		000			001					.38
A82671	PROD		18	102	008	007	22	02	02	05	01	044		000			001					.37

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S):

CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

Commodity: SEAMLESS CARBON STEEL PIPE

MILL TEST REPORTS

EN 10204/3.1.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: 2000097B2
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B
Date: FEB.15,2001

LOT2 **Total:** 33 Pcs., 402.34 m, 49599 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0180528	16"x0.500"xDRL	33	402.34	49599	231020457 A	320	470	46	G			G		0.20	0.23	0.54	0.012	0.016	0.02	0.04	0.01	0.08	0.02
					231020457 B	330	465	46															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G—————Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

Heat No s180528

Monitor Well Mill Certificates

Mill Certificates
MW–1
34–inch Diameter Casing

TELEPHONE: (416) 259-1113
FAX: (416) 259-6951

CANADIAN PHOENIX STEEL PRODUCTS

DIVISION OF 1045761 ONTARIO LIMITED
289 HORNER AVENUE
ETOBICOKE, ONTARIO,
CANADA
M8Z 4Y4

LABORATORY REPORT AND MILL TEST CERTIFICATE

DATE June 4/01

CUSTOMER Pipe & Piling Supplies

SPECIFICATION A139B

CUSTOMER'S P.O 6631

DIA. & WALL 34" O.D. X .375 WT

PHOENIX REF.# 01-3696

HYDROTEST 620 PSI FOR 1 Min.

PHYSICAL PROPERTIES

HEAT NO.	PIPE NO.	LONGITUDINAL TEST YIELD	TENSILE	% ELONGATION	TRANSVERSE WELD TENSILE	BREAK LOCATION
2844T	9	53400	78600	37.5	81900	PM
2605T	11	52600	78300	37.5	81700	PM
2604T	18	51500	75500	37.5	79100	PM
2840T	23	50800	74600	37.5	77900	PM
2842T	29	53100	78700	37.5	81900	PM

LADLE ANALYSIS

CHEMICAL COMPOSITION

HEAT NO	C	MN	S	P	SI	CR	NI	CU	MO	AL
2844T	.18	.87	.004	.007	.23	.02	.01	.01	.01	.042
2605T	.17	.86	.005	.011	.23	.01	.01	.01	.01	.035
2604T	.17	.83	.006	.011	.22	.01	.01	.01	.01	.036
2840T	.18	.80	.003	.007	.21	.01	.01	.01	.01	.033
2842T	.18	.86	.004	.006	.23	.02	.01	.01	.01	.035

The material listed on this report has been tested in accordance with the specification shown above.

Authorized Approval

Mill Certificates
MW–1
24–inch Diameter Casing

DATE: 03/13/00
TIME: 10:45:43 USX™

USA, USS, USX are trademarks of USX Corporation

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
0R08851 01		6717-USS	

MATERIAL COND: AS ROLLED

O.D.: 24.000(609.600) in (mm)

WALL: 0.500 (12.700) in (mm)

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	CHARPY V-NOTCH IMPACT TESTING												
					DIR	TEST LOC	TEMP	SIZE	TEST COND.	FT-LBS				% SHEAR			
										1	2	3	AVG	1	2	3	AVG
							DEG F										
A83674	OK																
A83675	OK																

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L X L/T ____ 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ L/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS

PREPARED BY THE OFFICE OF: J. MASSIMINO MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 03/13/00

ORIGINAL

Commodity: SEAMLESS CARBON STEEL PIPE

MILL TEST REPORTS

EN 10204/3.1.B.

Certificate No.: 2000097B5
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B
Date: FEB.15.2001

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

LOT2 Total: 45 Pcs., 511.48 m, 95615 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0083305	24"x0.500"xDRL	16	180.47	33739	611010264 A	350	480	41	G			G		0.19	0.22	0.44	0.020	0.015	0.02	0.04	0.01	0.08	0.0
					611010264 B	345	475	42															
0083315	24"x0.500"xDRL	15	170.58	31888	611010263 A	340	470	41	G			G		0.19	0.23	0.50	0.026	0.014	0.02	0.04	0.01	0.07	0.0
					611010263 B	340	475	42															
0083323	24"x0.500"xDRL	14	160.43	29988	631020029 A	365	485	43	G			G		0.18	0.24	0.50	0.007	0.013	0.01	0.03	0.01	0.05	0.01
					631020029 B	380	495	43															

VASS pipe

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G---------------Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

Mill Certificates
MW–1
16–inch Diameter Casing

Paragon Industries, Inc.
Rt.3 Box 331A
Sapulpa, Oklahoma, 74066
Phone: (918) 291-4459
Fax: (918) 291-0918

PLANT
Higway 117
5 Miles East of
Sapulpa, OK

MATERIAL TEST REPORT

Certificate Number	4222
Customer PO	11315

Melted and Manufactured in the USA

Results relate only to items tested. Test report not to be reproduced without written approval of Quality Assurance.

Manufactured by Electric Resistance Weld (Type E)

Customer	Product	Specifications
VASS PIPE & STEEL CO. 158 THIRD ST. P.O.BOX 583 MINEOLA, NY 11501-	16 x .500 82.85# A252-3	ASTM A252-98

MECHANICAL PROPERTIES

Heat Number	Steel Order No.		Yield Strength Psi	Tensile Strength Psi	Elongation % in 2 inches	Test Type Orientation/Tensile	Test Condition	Gauge Width
715685	3457		61590	73890	39.5%	Strip/Transverse/Body	As Rolled	1.5
✓ 815486	3457		63020	75610	40.0%	Strip/Transverse/Body	As Rolled	1.5
✓ 815488	3457		57240	74490	39.5%	Strip/Transverse/Body	As Rolled	1.5
✓ 715687	3457		58100	75200	46.5%	Strip/Transverse/Body	As Rolled	1.5
✓ 815489	3456		52710	71990	37.5%	Strip/Transverse/Body	As Rolled	1.5
815484	3457		55650	71910	43.0%	Strip/Transverse/Body	As Rolled	1.5
✓ 815487	3457		58680	79040	40.0%	Strip/Transverse/Body	As Rolled	1.5

CHEMICAL ANALYSIS %

Heat Number	Mill Control	C	MN	P	S	Si	Cr	Ni	Mo	Cu	V	Al	Ca
715685	Heat	0.220	0.820	0.011	0.006	0.012	0.038	0.055	0.017	0.099	0.002	0.024	0.002
	Product	0.209	0.826	0.011	0.006	0.031	0.042	0.058	0.020	0.110	0.002	0.021	0.001
815486	Heat	0.220	0.900	0.014	0.004	0.015	0.063	0.052	0.015	0.092	0.004	0.018	0.002
	Product	0.197	0.879	0.017	0.006	0.034	0.065	0.054	0.018	0.100	0.003	0.016	0.001
815488	Heat	0.220	0.840	0.014	0.007	0.014	0.063	0.052	0.013	0.092	0.002	0.025	0.002
	Product	0.184	0.843	0.017	0.009	0.033	0.064	0.055	0.018	0.104	0.002	0.023	0.001
715687	Heat	0.220	0.830	0.012	0.002	0.017	0.037	0.054	0.015	0.095	0.003	0.026	0.002
	Product	0.197	0.834	0.016	0.004	0.037	0.042	0.058	0.020	0.109	0.002	0.024	0.001
815489	Heat	0.210	0.870	0.012	0.003	0.021	0.065	0.054	0.015	0.094	0.003	0.027	0.002
	Product	0.191	0.885	0.017	0.005	0.041	0.066	0.058	0.019	0.108	0.002	0.022	0.001
815484	Heat	0.210	0.840	0.011	0.007	0.016	0.045	0.050	0.014	0.086	0.003	0.024	0.002
	Product	0.176	0.835	0.013	0.007	0.042	0.047	0.053	0.017	0.096	0.002	0.021	0.001
815487	Heat	0.220	0.950	0.017	0.003	0.022	0.085	0.051	0.014	0.090	0.003	0.019	0.003
	Product	0.192	0.935	0.021	0.004	0.042	0.085	0.056	0.018	0.104	0.002	0.016	0.001

TEST / INSPECTION		
Hydrostatic Test PSI	N/A	@ 5 secs
Flattening Test	N/A	
Ultrasonic weldline (NDT)	N/A	.125 DH
Full Length Visual	YES	
Full Length Drift	N/A	size
Heat Treat Min. Temperature	N/A	degrees

Comment

We certify that the product described above has been manufuctured, Sampled, Inspected and tested in accordance to the referenced specification and / or order, and is in compliance with all requirements. QA Department

11/01

P.MTR.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-11-A
Transmittal No. # 027 **Date:** 2/1/02
Signature TMF

Attn: Mark – 941 – 484-4505

MILL'S CERTIFICATE

CHENGDU SEAMLESS STEEL TUBE CO., LTD.

CONTRACT No : X762800/10X09-106
CUSTOMER :
L/C No :
OBJECT : Seamless Steel Line Pipes

SHIPPING MARK : HOB
CERTIFICATE No : N01
STANDARD: API 5L/ASTM
GRADE : X42

Heat Nos. 59921774 ✓
Heat Nos. 9971411 ✓

TOTAL: 173 PACKAGES, 349 PCS, 13960 FT, 322137 Kg

HEAT No.	SIZE	QUANTITY				TEST PIECE No.	MECHANICAL PROPERTIES			WORKMANSHIP TEST		CH			
		PACKAGES	PCS.	FT	Kg		Y.S (PSI)	T.S (PSI)	EL. (%)	1	4	C	Si	Mn	S
59921871	16" x 0.375" x 40'	25	25	1000	28400	619110047 A	60800	78100	30.0	G	2800	0.20	0.23	0.43	0.018
						B	69900	72000	36.0						
59921851	16" x 0.375" x 40'	12	12	480	13632	629110049 A	49300	68900	42.0	G	2800	0.20	0.27	0.46	0.021
						B	48600	70300	35.0						
59921774	16" x 0.562" x 40'	25	25	1000	28400	639110034 A	52200	70300	30.0	G	2800	0.19	0.28	0.40	0.019
						B	58700	70500	31.0						
9971411	16" x 0.500" x 40'	21	21	1080	40581	239110630 A	50000	74700	44.0	G	2800	0.15	0.46	1.53	0.008
						B	49300	74700	44.0						
9981319	4" x 0.337" x 40'	12	60	2400	16332	349110460 A	54400	71800	40.0	G	2800	0.18	0.24	0.59	0.015
						B	49300	70300	40.0						
9981319	4" x 0.337" x 40'	32	160	6400	43662	339110438 A	52900	72500	40.0	G	2800	0.18	0.24	0.54	0.016
						B	52900	72500	38.0						
59921860	18" x 0.375" x 40'	28	28	1120	35868	629100312 A	52900	73200	39.0	G	2800	0.21	0.24	0.42	0.019
						B	62900	71100	39.0						
59921856	18" x 0.375" x 40'	12	12	480	15372	629100316 A	50000	69000	34.0	G	2800	0.20	0.21	0.40	0.020
						B	500	100	1.0						

Attn Mark - 941-489-4565

MILL'S CERTIFICATE

CHENGDU SEAMLESS STEEL PIPE CO., LTD.

CONTRACT No : 3762800/HX09-106

CUSTOMER :

L/C No :

OBJECT : Seamless Steel Line Pipes

SHIPPING MARK : HOUSTON

CERTIFICATE No : 5D12000-1

STANDARD: API 5L/ASTM A106/A53/ASME SA106/SA53 NACE MR-0175

GRADE : X42

TOTAL: 173 PACKAGES, 349 PCS, 13960 FT, 222247 Kg

HEAT No	SIZE	QUANTITY				TEST PIECE No		MECHANICAL PROPERTIES			WORKMANSHIP TEST		CHEMICAL COMPOSITION (%)									
		PACKAGES	PCS.	FT	Kg			Y.S (PSI)	T.S (PSI)	EL (%)	1	4	C	Si	Mn	S	P	RESIDUAL ELEMENTS				
																		Cr	Ni	Mo	Cu	V
S9921871	16" x 0.375" x 40'	25	25	1000	28400	619110047	A	60000	78100	30.0	G	2800	0.20	0.23	0.43	0.016	0.011	0.01	0.02	0.010	0.060	0.01
							B	69200	72000	30.0												
S9921855	16" x 0.375" x 40'	12	12	480	13632	629110049	A	49300	68900	43.0	G	2800	0.20	0.27	0.46	0.021	0.010	0.03	0.04	0.010	0.110	0.01
							B	48600	70300	35.0												
S9921774	16" x 0.562" x 40'	26	25	1000	28400	639110034	A	52200	70300	30.0	G	2800	0.19	0.28	0.18	0.019	0.025	0.01	0.01	0.010	0.070	0.00
							B	53700	70500	31.0												
9971411	16" x 0.500" x 40'	27	27	1080	40581	239110630	A	50000	74700	44.0	G	2800	0.15	0.46	1.53	0.008	0.018	0.03	0.05	0.010	0.060	0.01
							B	49300	74700	44.0												
9981319	4" x 0.337" x 40'	12	60	2400	16332	349110460	A	54400	71800	40.0	G	2800	0.10	0.24	0.64	0.016	0.013	0.03	0.04	0.010	0.060	0.01
							B	49300	70300	40.0												
9981319	4" x 0.337" x 40'	32	160	6400	43662	339110438	A	52900	72500	40.0	G	2800	0.18	0.24	0.64	0.016	0.013	0.05	0.04	0.010	0.060	0.01
							B	52900	72500	30.0												
S9921860	18" x 0.375" x 40'	28	28	1120	35868	619100312	A	52900	73200	39.0	G	2000	0.21	0.24	0.42	0.019	0.016	0.02	0.04	0.010	0.030	0.01
							B	62900	71100	39.0												
S9921836	18" x 0.375" x 40'	12	12	480	15372	629100316	A	50000	69000	34.0	G	2800	0.20	0.23	0.40	0.020	0.017	0.05	0.07	0.010	0.120	0.01
							B	51600	71100	41.0												

NOTES:

1. FLATTEN TEST
2. BENDING TEST
3. FLARING TEST
4. HYDROSTATIC TEST (PSI)

REMARKS:

1. CONDITION OF SUPPLY : HOT-ROLLED
2. TUBE DELIVERED IN THEORETICAL WEIGHT
3. G -----GOOD

INSPECTOR:

CONSIGNOR:

DATE 22. 2. 20

P14004

VALLOUREC & MANNESMANN TUBES

(A01) V & M FRANCE
Tuberie d'Aulnoye

64 rue de Leval BP 159
59620 Aulnoye-Aymeries FRANCE

tél: 03.27.69.66.00
fax: 03.27.69.67.10

MATERIAL TEST REPORT

INSPECTION CERTIFICATE EN 10204 3.1.B

M. T. R.
EN 10204 3.1.B

ISO 9001

(A03)Réf: 23-01-103044 3 / 4
(A06)N°V&M: LA0368/13

HARDNESS ROCKWELL < OR = 22 GUARANTEE

(C40-C02-C41)
CHARPY V TRANSVERSE IMPACT TEST / FLEXION PAR CHOC EN TRAVERS CHARPY V

(C00) Test Essai	(B08) Heat coulée	H.T.lot, lot t.th.	(C03) temp.	width larg.	thick. épais.	sect.	(C42) E1	(C42) E2	(C42) E3	(C43) mean moy.
MIN.			0				29.0	29.0	29.0	41.0
MAX.										
			°C	mm	mm	cm2	J	J	J	J
82402	03656	633	0	10.00	10.00	0.80	141.6	142.2	164.1	149.3
82405A	03559	634	0	10.00	10.00	0.80	158.7	151.0	158.1	155.9

(D01-D99)
NON DESTRUCTIVE TESTS / CONTROLES NON DESTRUCTIFS

test nature d'essai	test rate contrôle	specification spécification	conditions conditions	pressure pression psi	hold time durée sec	result résultat
ELECTROMAGNETIC TEST CONTROLE ELECTRO-MAGNETIQUE	100% LOT 100% LOT	SR4	LONG:EXT 5% WALL THICKNESS LONG:EXT 5% DE L'EPAISSEUR			OK BON
HYDROSTATIC TEST EPREUVE HYDROSTATIQUE	100% LOT 100% LOT			2230	5	OK BON
APPEARANCE & DIMENSIONS ASPECT & DIMENSIONS	100% LOT 100% LOT					OK BON

(C50-C69)
TECHNOLOGICAL TESTS / ESSAIS TECHNOLOGIQUES

test nature d'essai	result résultat
FLATTENING TEST APLATISSEMENT	OK BON

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

TIME: 09:18:44 USX™

USS, USM, USX are trademarks of USX Corporation

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	VEHICLE I.D.
DR03525 05		97972-D	

VENDOR

USS TUBULAR PRODUCTS
2199 EAST 28TH ST.
LORAIN, OH 44055

SPECIFICATION AND GRADE

PIPE CARBON SMLS STD PIPE API 5L-X41ST EDITION DTD 4/1/95 GRADE B AND GRADE X42 ASTM A53-X98 ASTM A106-X97A GRADE B QUAD STENCIL ASME SA53-X1998 EDITION 1998 ADDENDUM ASME SA106-X1998 EDITION 1998 ADDENDUM GRADE B CARBON EQUIVALENT ON HEAT ANALYSIS .40 MAX BASED ON C+MN OVER 6 + (CR+MO+V) OVER 5 + (CU+NI) OVER 15 BLK REG MILL COAT PE BEV 30 DEG MEETING ALL THE APPLICABLE REQUIREMENTS OF NACE STANDARD MR-01-75

MATERIAL COND.: AS ROLLED

O.D.: 16.000(406.400) In (mm)

WALL: 0.500 (12.700) In (mm)

TENSILE

PRODUCT IDENTIFICATION	TEST TYPE/ ORIENTATION	TEST COND.	GAUGE WIDTH	YIELD	EXT %	TENSILE	Y/T	ELONG % IN 1 IN	HARDNESS SCALE:	MIN HYDRO	DWELL (SEC)
				MIN: PSI MAX: 42000	.50	MIN: PSI MAX: 60000	MAX:	MIN:	MIN: HRB MAX.	PSI 2230	5
A82671	STRIP/T/B	AR	IN 1.500	46000	.50	73000	0.63	29.5 43.0	100.0 B 76.0	2230	5

** END OF DATA THIS SHEET **

LEGEND: L - LONGITUDINAL, U - UPSET, T - TRANSVERSE, N - NORMALIZED, QT - QUENCHED & TEMPERED, SR - STRESS RELIEVED, AR - AS ROLLED, B - BODY, W - WELD

PRODUCT IDENTIFICATION	TYPE		C	MN	P	S	SI	CU	NI	CR	MO	AL	N	V	B	TI	CB	CO				CE*
																						MAX .40
A82671	HEAT		17	103	009	007	24	02	02	05	01	045		002			001					.36
A82671	PROD		20	103	008	006	23	02	02	05	01	046		000			001					.38
A82671	PROD		18	102	008	007	22	02	02	05	01	044		000			001					.37

** END OF DATA THIS SHEET **

*C.E. IS BASED ON THE FOLLOWING EQUATION(S):

CE=C+(MN/6)+(CR+MO+V)/5+ (NI+CU)/15

DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

Heat No. 82671

Commodity: SEAMLESS CARBON STEEL PIPE

…无缝钢管有限责任公司
…GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

MILL TEST REPORTS

EN 10204/3.I.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: 2000097A
Standard: ASTM A53/ASME SA53/
ASTM A106/ASME SA106/API 5L
Grade: B/X42

PO #
L947

LOT 1

Total:

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)								
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu
P0026363	12-3/4"x0.375"x40ft	2	24.38	1800	220120288 A	335	485	42	G			G		0.22	0.23	0.44	0.019	0.023	0.02	0.03	0.01	0.04
					220120288 B	335	480	40														
0083246	8-5/8"x0.322"x40ft	104	1267.97	53950	130120048 A	375	515	38	G			G		0.20	0.27	0.53	0.013	0.011	0.01	0.05	0.01	0.09
					130120048 B	375	525	39														
0083247	8-5/8"x0.322"x40ft	100	1219.20	51875	130120049 A	375	515	36	G			G		0.22	0.33	0.55	0.013	0.013	0.02	0.05	0.01	0.09
					130120049 B	345	490	36														
0083307	6-5/8"x0.280"x40ft	65	792.48	22399	120120150 A	315	530	31	G			G		0.20	0.25	0.54	0.018	0.014	0.02	0.04	0.01	0.07
					120120150 B	310	525	37														
0083308	6-5/8"x0.280"x40ft	175	2133.60	60305	120120148 A	325	525	33	G			G		0.22	0.24	0.54	0.013	0.016	0.02	0.05	0.01	0.07
					120120148 B	330	540	40														
0083309	6-5/8"x0.432"x40ft	136	1658.11	70384	120120181 A	315	520	38	G			G		0.22	0.23	0.50	0.014	0.016	0.02	0.05	0.02	0.07
					120120181 B	320	530	36														
0083265	10-3/4"x0.365"x40ft	60	731.52	44100	140120072 A	335	500	37	G			G		0.21	0.25	0.53	0.015	0.013	0.01	0.04	0.01	0.06
					140120072 B	330	505	34														
0083253	8-5/8"x0.500"x40ft	57	694.94	44916	120120057 A	410	540	42	G			G		0.14	0.47	1.17	0.017	0.014	0.02	0.05	0.02	0.08
					120120057 B	435	540	41														
0082725	14"x0.500"x40ft	37	451.10	48433	211010027 A	350	535	44	G			G		0.14	0.49	1.24	0.017	0.014	0.04	0.05	0.02	0.07
					211010027 B	355	535	44														
0082757	14"x0.375"x40ft	50	609.60	49550	230110128 A	330	505	41	G			G		0.21	0.21	0.54	0.010	0.016	0.01	0.04	0.01	0.06
					230110128 B	350	500	36														
0083325	14"x0.375"x40ft	44	536.45	43604	241010024 A	335	495	40	G			G		0.21	0.24	0.54	0.014	0.013	0.02	0.04	0.01	0.08
					241010024 B	335	495	41														
0080632	12-3/4"x0.500"x40ft	28	341.38	33264	210120372 A	355	510	47	G			G		0.12	0.42	1.18	0.016	0.009	0.04	0.05	0.01	0.07
					210120372 B	360	510	44														
0081927	12-3/4"x0.500"x40ft	50	609.60	59400	220120375 A	370	520	44	G			G		0.14	0.40	1.31	0.010	0.014	0.04	0.04	0.01	0.06
					220120375 B	380	515	46														
0081552	16"x0.500"x40ft	50	609.60	75150	221010043 A	345	510	48	G			G		0.14	0.40	1.15	0.200	0.018	0.04	0.03	0.01	0.10
					221010043 B	355	515	44														

…钢管有限…
[illegible]

'ea' 'Jo. 81563

U.S. STEEL GROUP
A DIVISION OF USX CORPORATION

TUBULAR PRODUCTS
CERTIFIED TEST REPORT

(TYPE B - IN ACCORDANCE WITH ISO 10474/EN10204/DIN50049)

DATE: 09/17/99
TIME: 09:18:49 USX™

USS, USS, USX are trademarks of USX Corporation

MILL ORDER/ITEM NO.	SHIPPERS NO.	P.O. NUMBER	
DR03525 05		97972-0	

MATERIAL COND:	OD: in (mm)	WALL: in (mm)
AS ROLLED	16.000(406.400)	0.500 (12.700)

CHARPY V-NOTCH IMPACT TESTING

PRODUCT IDENTIFICATION	FLAT	BEND	GRAIN SIZE	MIN COLLAPSE	DIR	TEST LOC.	TEMP	SIZE	TEST COND.	FT-LBS 1	FT-LBS 2	FT-LBS 3	FT-LBS AVG	% SHEAR 1	% SHEAR 2	% SHEAR 3	% SHEAR AVG
							DEG.										
A82671	OK		** END OF DATA THIS SHEET **														

LEGEND: L - LONGITUDINAL T - TRANSVERSE B - BODY W - WELD HAZ - HEAT AFFECTED ZONE

TESTING / INSPECTION INFORMATION

TEST / INSPECTION	YES	RESULTS / COMMENTS
FULL LENGTH VISUAL	X	
FULL LENGTH EMI	X	OD X OD/ID ____ L ____ U/T X 10.0% NOTCH
FULL LENGTH MPI		
FULL LENGTH UT		OD ____ OD/ID ____ L ____ U/T ____
END AREA INSPECTION (PLAIN END)		MPI ____ UT ____
SPECIAL END AREA (SEA) INSP.		MPI ____ UT ____
FULL LENGTH DRIFT		DRIFT MANDREL SIZE:

ADDITIONAL NOTES/COMMENTS

ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. NO REPAIRS BY WELDING. NO MERCURY OR MERCURY COMPOUNDS ARE ADDED TO THE STEEL AND ALL MERCURY BEARING EQUIPMENT IS PROTECTED BY A DOUBLE BOUNDARY OF CONTAINMENT.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-07-A
Transmittal No. # 04 Date: 2/8/07
Signature

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS THE REQUIREMENTS IN SUCH RESPECTS.

PREPARED BY THE OFFICE OF:
F.J. MIKULSKI MGR. MET. &
Q.A. USS TUBULAR PRODUCTS

DATE 09/17/99

Heat No. 82671

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-11-A
Transmittal No. # 05 **Date:** 8/7/01
Signature

MIL[illegible] CER[illegible]CATE

PANGANG GROU[illegible]ENG[illegible]ESS STEEL TUBE CO., LTD.

CONTRACT № : 3774000/HYX2000-079
CUSTOMER :
L/C № :
OBJECT : Seamless Steel Line Pipes

SHIPPING MARK : HOUSTON
CERTIFICATE № : 200079009
STANDARD:API 5L/ASTM A106/A53/ASME SA106/SA53/NACE MR-0175
GRADE : X42/B

TOTAL: 60 PACKAGES, 60 PCS., 731.52 m, 90180 Kg

✓ HEAT №	SIZE	QUANTITY				TEST PIECE №	MACHANICAL PROPERTIES			WORKMANSHIP TEST		CHEMICAL COMPOSITION (%)									
																	RESIDUAL ELEMENTS				
		PACKAGES	PCS.	m	Kg		Y.S (PSI)	T.S (PSI)	EL. (%)	1	4	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0081552	16" x 0.500" x 40'	10	10	121.92	15030	220070299 A	53000	72000	40.0	G	2230	0.13	0.52	1.13	0.006	0.019	0.04	0.04	0.010	0.070	0.01
						B	50000	73000	46.0												
S0120081	16" x 0.500" x 40'	50	50	609.60	75150	210070294 A	51000	78000	43.0	G	2230	0.14	0.42	1.17	0.019	0.018	0.06	0.04	0.010	0.060	0.01
						B	51000	77000	44.0												

NOTES:

1. FLATTEN TEST
2. BENDING TEST
3. FLARING TEST
4. HYDROSTATIC TEST(PSI)

REMARK:

1. CONDITION OF SUPPLY : HOT-ROLLED
2. TUBE DELIVERRED IN THEORETICAL WEIGHT
3. G---GOOD

INSPECTOR:

CONSIGNOR:

DATE: 2000. 8. 22

Heat No. 81552

MIL[illegible] CE[illegible]CATE

PANGANG GROU[illegible] STEEL TUBE CO., LTD.

CONTRACT No : 3774008/01X2000-079
CUSTOMER :
L/C No :
OBJECT : Seamless Steel Line Pipes

SHIPPING MARK : HOUSTON
CERTIFICATE No : 200079009
STANDARD:API 5L/ASTM A106/A53/ASME SA106/SA53/NACE MR-0175
GRADE : X42/B

TOTAL: 60 PACKAGES, 60 PCS., 731.52 m, 90150 Kg

70307 →
80665 →

HEAT No.	SIZE	QUANTITY				TEST PIECE No.	MECHANICAL PROPERTIES			WORKMANSHIP TEST		CHEMICAL COMPOSITION (%)									
																	RESIDUAL ELEMENTS				
		PACKAGES	PCS.	m	Kg		Y.S (PSI)	T.S (PSI)	EL (%)	1	4	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0070307	16" x 0.500" x 40'	10	10	121.92	15000	22070289 A B	53000 50000	72000 73000	46.0 46.5	G	2230	0.13	0.32	1.13	0.006	0.019	0.04	0.04	0.010	0.070	0.02
0080665	16" x 0.500" x 40'	50	50	609.60	75150	21070294 A B	51000 51000	78000 77000	43.0 44.0	G	2230	0.14	0.42	1.37	0.015	0.018	0.05	0.04	0.010	0.050	0.01

NOTES:
1. FLATTEN TEST
2. BENDING TEST
3. FLARING TEST
4. HYDROSTATIC TEST(PSI)

REMARK:
1. CONDITION OF SUPPLY : HOT-ROLLED
2. TUBE DELIVERED IN THEORETICAL WEIGHT
3. G——GOOD

INSPECTOR: [illegible]

CONSIGNOR: 刘春[illegible]

DATE: 2000.8.22

Heat Nos. 80665/70307

CUSTOMER :

L/C NO. : LAP1027A

COMMODITY : 15,224 FEET PRIME NEWLY MANUFACTURED ELECTRIC RESISTANCE WELDED PIPE(ERW)IN ACCORDANCE WITH THE LATEST EDITION OF API 5L GRADE B AND ASTM A53 GRADE B AND ASME SA53 GRADE B

YIEH LOONG ENTERPRISE CO.,LTD.

MILL TEST CERTIFICATES

CERTIFICATE NO. : YL-10138

DATE : APR 15 2001

SHIPPING DATE : APR 15 2001

Series No.	M.F.D. NO. OR HEAT NO.	SPECIFICATION	DIMENSION INSPECTION	WEIGHT MT	U.T.	R.T.	H.T. PSI	CHEMICAL COMP. %										TENSILE TEST				WELD DUCTILITY TEST	FLATTEN TEST	ZINC COATING TEST	RESULT
								C	Mn	P	S	V	Mo	Cu	Ni	Cr	Si	Y.P. Kg/mm²	M.T.S. Kg/mm²	EL.	W.T.S. Kg/mm²				
								×100		×1000		×100													
001	O2255	API 5L GRADE B/ASTM A53 GRADE B/ASME SA53 GRADE B 6"X0.280"X40'2" (120PCS) ✓	OK	41.475	OK		1805	10	72	10	8	1	1	1	1	1	1	33.8	47.6	35.8			OK		OK
002	O3465	API 5L GRADE B/ASTM A53 GRADE B/ASME SA53 GRADE B 8"X0.322"X40'2" (114PCS) ✓	OK	59.299	OK		1564	9	70	10	9	1	1	2	1	1	1	33.9	48.5	35.2	53.0		OK		OK
✓ 003	O3705	API 5L GRADE B/ASTM A53 GRADE B/ASME SA53 GRADE B 16"X0.500"X40'2" (53PCS) ✓	OK	79.932	OK		1322	12	74	9	7	1	1	1	1	1	1	33.5	47.4	35.2	53.4		OK		OK
004	O3745	API 5L GRADE B/ASTM A53 GRADE B/ASME SA53 GRADE B 16"X0.250"X40'2" (92PCS) ✓	OK	70.497	OK		839	11	72	8	8	1	1	1	1	1	1	33.5	47.3	35.6	52.9		OK		OK

Yieh Loong Enterprise Co., Ltd.

Quality Assurance Department

We hereby certify that the material described herein has been manufactured and tested with satisfactory results in accordance with the requirement of the above material specification.

TEL : 886-7-787-1581 FAX : 886-7-787-1554

REMARK : APPLICANT'S NAME: AND N14016

ALL PIPES ABOVE MENTION ARE BLACK PLAIN END (BPE) AND LACQUER COATING.

WE HEREBY CERTIFYING THAT MATERIAL IS IN ACCORDANCE WITH API 5L GRADE B AND ASTM A53 GRADE B AND ASME SA53 GRADE B.

SEAMLESS
TUBE CO., LTD.

0081563	16"x0.500"x40ft	3	36.58	4509	221010042 A	370	525	47	G			G		0.16	0.45	1.16	0.012	0.017	0.02	0.04	0.01	0.07	0.01
					221010042 B	340	510	43															
S0021739	16"x0.375"x40ft	28	341.39	31808	610120112 A	375	495	36	G			G		0.19	0.22	0.48	0.024	0.026	0.02	0.04	0.01	0.09	0.01
					610120112 B	375	510	40															
S0021787	16"x0.375"x40ft	25	304.80	28400	610120110 A	380	530	40	G			G		0.18	0.26	0.54	0.017	0.017	0.01	0.04	0.01	0.12	0.0
					610120110 B	375	520	33															
S0021791	16"x0.375"x40ft	26	316.99	29536	630120106 A	385	515	40	G			G		0.21	0.24	0.58	0.019	0.021	0.03	0.12	0.01	0.14	0.0
					630120106 B	385	515	40															
S0021794	16"x0.375"x40ft	21	256.03	23856	610120117 A	395	520	36	G			G		0.22	0.27	0.60	0.011	0.022	0.05	0.08	0.01	0.11	0.0
					610120117 B	395	550	30															
P0015422	12-3/4"x0.375"x40ft	50	609.60	45000	220120289 A	330	480	40	G			G		0.21	0.27	0.50	0.011	0.020	0.02	0.02	0.01	0.04	0.
					220120289 B	325	485	41															
P0016466	12-3/4"x0.375"x40ft	50	609.60	45000	220120291 A	325	480	41	G			G		0.19	0.22	0.51	0.021	0.015	0.04	0.04	0.01	0.03	0.
					220120291 B	335	480	42															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G————Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-07-A
Transmittal No. # 011 Date: 8/28/01
Signature

SEAMLESS
STEEL TUBE CO., LTD.

Heat No. 81563

Commodity: SEAMLESS CARBON STEEL PIPE

MILL TEST REPORTS

EN 10204/3.1.B.

Pangang Group Chengdu Seamless Steel Tube Co., Ltd.

Certificate No.: 2000097B2
Standard: ASTM A53/ASME SA53/ ASTM A106/ASME SA106/API 5L
Grade: B
Date: FEB.15,2001

LOT2 Total: 33 Pcs., 402.34 m, 49599 Kgs

Heat No.	Size	Quantity			Test Piece No.	Mechanical Properties			Workmanship Test					Chemical Analysis (%)									
		Pcs.	Length(m)	Weight(Kg)		Y.S.(Mpa)	T.S.(Mpa)	EL.(%)	1	2	3	4	5	C	Si	Mn	S	P	Cr	Ni	Mo	Cu	V
0180528	16"x0.500"xDRL	33	402.34	49599	231020457 A	320	470	46	G			G		0.20	0.23	0.54	0.012	0.016	0.02	0.04	0.01	0.08	0.02
					231020457 B	330	465	46															

Notes:

1. Flattening test
2. Bending test
3. Pipe flaring test
4. Hydrostatic test
5. Non-destructive test

Remarks:

1. Condition of supply: hot rolled
2. Tubes deliveried in theoretical weight
3. NACE MR01-75(1995) with HRC Max 22.
4. G————Good
5. The weight is net weight

Inspector: Cheng Yu

WE CONFIRM THAT MATERIAL AND TOLERANCES ARE FULLY IN COMPLIANCE WITH ABOVE.

攀钢集团成都无缝钢管有限责任公司
PANGANG GROUP CHENGDU SEAMLESS
STEEL TUBE CO.,LTD.

Heat No s180528

Mill Certificates
MW–1
6⅝–inch Diameter Casing

Manufacturer
SC PETROTUB SA
A.V. ROMAN – IASI KM. 333,
Z.I.P. 5550 - ROMAN
ROMANIA

Mill Test Report
acc. to DIN 50049-3.1.B and E.N. 10204/31B/91

NO.
B 1247

Date:
02.07.2001

BUYER:

Description of goods:
"PRIME QUALITY, NEWLY PRODUCED SEAMLESS STEEL PIPES TO ASTM A53-B, ASTM A106-B, ASME SA-53-B, ASME SA-106-B, API 5L-X42, CARBON EQUIVALENT TO LONG FORMULA, IN COMPLIANCE WITH NACE STANDARD MR-01-75, WITH ISO 9002 CERTIFICATION, MULTIPLE STENCILING WITH SPECS. AS SHOWN, OUTSIDE MILL LACQUER VARNISH, BEVELLED ENDS 30 DEGREES +5 DGRS/-0, WITH PLASTIC END CAPS".

Quantity:
43144 KGS

Total Length:
796.01 MTRS

Contract No.
SP 2035

Standard
API 5L-PSL 1/2000; ASTM A106/99; ASTM A53/99; ASME SA 106/98; ASME SA 53/98; NACE MR 01-75/2000

65 PCS/
14 BDLS

Item	Size [inches] (mm)	Steel	Heat	Pcs	Length [m]	Weight [kg]	Hydro Test [PSI]	Chemical Composition % on the product														Mechanical Properties					
								C x100	Mn x100	Si x100	S x1000	P x1000	Cr x100	Ni x100	Cu x100	Mo x100	V x100	Nb x100	Ti x100	B x100	CEQ max. 0.43 %	Rp [PSI] :1000	Rm [PSI] :1000	A %	HB max 236	HRC max. 22	Flattening Test
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		21	22	23	24	25	26
	6"SCH120 Φ168.3 x14.27 mm Lg: DRL	Gr.B/ X42	P121378	18			3000	18	47	21	29	14	8	3	3	0.0	0.2	0.0	0.1	0.06	0.28	49.8	73.8	41.67	148;146	8;7	OK
								19	48	21	29	14	8	3	3	0.0	0.2	0.0	0.1	0.06	0.29	.50.0	74.2	38.95	146;148	7;8	
			P121383	31			3000	20	46	20	28	16	2	2	3	0.0	0.2	0.0	0.1	0.06	0.28	52.3	77.6	44.60	150;148	6;6	OK
								19	46	20	29	15	2	3	3	0.0	0.2	0.0	0.1	0.06	0.27	50.3	74.7	37.72	148;148	7;6	
			P111416	16			3000	18	51	25	29	12	2	2	4	0.0	0.2	0.0	0.1	0.06	0.27	51.2	75.9	39.63	146;144	7;7	OK
								18	51	25	29	12	2	2	4	0.0	0.2	0.0	0.1	0.06	0.27	51.0	75.7	37.14	146;148	6;7	

REMARKS: Hydrostatic test hold for 5 sec. No leakage noticed.

We certify our sole responsibility that the materials which this certificate relates to are in conformity with specification requirements.

GENERAL MANAGER
Dr. Eng. Bîrsan Romano Dorel

Chief Inspection Dept.
Eng. Nicolau Constantin

QA Office
Eng. Moroianu M.

AQ
1

S.M.

Formular 12A, rev.2   *E 002057*

Manufacturer **SC PETROTUB SA** **A.V. ROMAN - IASI KM. 333,** **Z.I.P. 5550 - ROMAN** **ROMANIA**	**Mill Test Report** **acc. to DIN 50049-3.1.B and E.N. 10204/31B/91**	**NO.** **B 1247**	**Date:** **02.07.2001**

GAUGE LONGITUDINAL

Heat No.	Standard	Length Inch	Width Inch	Thickness Inch
P121378	API 5L	2	1.000	0.570
	ASTM/ASME	2	0.748	0.559
P121383	API 5L	2	1.000	0.543
	ASTM/ASME	2	0.752	0.553
P111416	API 5L	2	1.000	0.555
	ASTM/ASME	2	0.752	0.546

Heat No.	Chemical Composition Bulletin No.	Mechanical Properties Bulletin No.	Hardness Test HB Bulletin No.	Hardness Test HRC Bulletin No.	Flattening test Bulletin No.
P121378	1451	788/464B	81	4473	325
P121383	1451	788/464B	81	4473	325
P111416	1451	788/464B	81	4473	325

e certify our sole responsibility that the materials which this rtificate relates to are in conformity with specification quirements.	**GENERAL MANAGER** **Dr. Eng. Bârsan Romano Dorel**	**Chief Inspection Dept.** **Eng. Nicolau Constantin**	**QA Officer** **Eng. Mordianu Mo**

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APPENDIX L

CEMENT REPORTS

APPENDIX L

Cement Reports

Concentrate Disposal Well IW-1
City of Pompano Beach

Conductor Casing

Casing Diameter:	50-inches
Casing Depth:	121 feet below pad level
Bit Size:	Nominal 58-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	1
Cement Blend:	Neat
Cement Density:	Neat – 15.6 lb./gal
Theoretical Fill From Caliper Log:	N/A
Volume Pumped:	Neat – 1,032 cubic feet Total – 1,032 cubic feet
Percent Difference:	N/A

The 50-inch casing was cemented in one stage. The cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to additional cement utilized to fill small irregularities in the borehole wall.

Surface Casing

Casing Diameter:	42-inches
Casing Depth:	1,020 feet below pad level
Bit Size:	Nominal 50-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	1
Cement Blend:	Neat 12% Bentonite
Cement Density:	Neat - 15.6 lb./gal 12% Bentonite - 12.6 lb./gal
Theoretical Fill From Caliper Log:	4,124 cubic feet
Volume Pumped:	Neat - 842 cubic feet 12% Bentonite – 3,085 cubic feet Total – 3,927 cubic feet
Percent Difference:	5%

The 42-inch casing was cemented in one stage. The cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to small irregularities in the borehole wall.

Intermediate Casing

Casing Diameter:	34-inches
Casing Depth:	1,950 feet below pad level
Bit Size:	Nominal 42-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	7
Cement Blend:	Neat 12% Bentonite
Cement Density:	Neat - 15.6 lb./gal 12% Bentonite - 12.6 lb./gal
Theoretical Fill From Caliper Log:	8,227 cubic feet
Volume Pumped:	Neat – 583 cubic feet 12% Bentonite – 10,662 cubic feet Total – 11,245 cubic feet
Percent Difference:	27%

The 34-inch casing was cemented in seven stages. After each stage a temperature log was run downhole and the cement physically tagged to determine the actual fill. On the final stage the cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to additional cement utilized to fill spaces that exceed the maximum opening of the caliper tool and small irregularities in the borehole wall.

Inner Casing

Casing Diameter: 24-inches
Casing Depth: 2,293 feet below pad level
Bit Size: Nominal 32-inch diameter
Cement Specification: ASTM C 150 Type II
Number of Stages: 10
Cement Blend: Neat
12% Bentonite
Cement Density: Neat - 15.7 lb./gal
12% Bentonite - 12.6 lb./gal
Theoretical Fill From Caliper Log: 6,786 cubic feet
Volume Pumped: Neat - 1,689 cubic feet
12% Bentonite - 7,125 cubic feet
Total - 8,814 cubic feet
Percent Difference: 23%

The 24-inch casing was cemented in ten stages. After each stage a temperature log was run downhole and the cement physically tagged to determine the actual fill. On the final stage the cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to additional cement utilized to fill spaces that exceed the maximum opening of the caliper tool and small irregularities in the borehole wall.

Tubing

Tubing Diameter:	16-inches
Tubing Depth Depth:	2,273 feet below pad level
Cement Specification:	ASTM C 150 Type II
Number of Stages:	6
Cement Blend:	Neat 12% Bentonite
Cement Density:	Neat - 15.7 lb./gal 12% Bentonite - 12.6 lb./gal
Theoretical Fill:	3,384 cubic feet
Volume Pumped:	Neat - 345 cubic feet 12% Bentonite – 3,074 cubic feet Total – 3,419 cubic feet
Percent Difference:	1%

The 16-inch tubing was cemented in six stages. After each stage a temperature log was run downhole and the cement physically tagged to determine the actual fill. On the final stage the cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to additional cement pumped to confirm returns at the surface.

APPENDIX L

Cement Reports

Dual-Zone Monitor Well MW-1
City of Pompano Beach

Conductor Casing

Casing Diameter:	24-inches
Casing Depth:	163 feet below pad level
Bit Size:	Nominal 34-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	1
Cement Blend:	Neat
Cement Density:	Neat – 15.7 lb./gal
Theoretical Fill From Caliper Log:	507 cubic feet
Volume Pumped:	Neat – 517 cubic feet Total – 517 cubic feet
Percent Difference:	2%

The 24-inch casing was cemented in one stage. The cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to additional cement utilized to fill small irregularities in the borehole wall.

Intermediate Casing

Casing Diameter:	16-inches
Casing Depth:	1,520 feet below pad level
Bit Size:	Nominal 24-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	3
Cement Blend:	Neat 12% Bentonite
Cement Density:	Neat - 15.6 lb./gal 12% Bentonite - 12.7 lb./gal
Theoretical Fill From Caliper Log:	2,192 cubic feet
Volume Pumped:	Neat - 449 cubic feet 12% Bentonite – 1,682 cubic feet Total – 2,131 cubic feet
Percent Difference:	3%

The 16-inch casing was cemented in three stages. After each stage a temperature log was run downhole and the cement physically tagged to determine the actual fill. On the final stage the cement was circulated to surface and was visually confirmed. The difference in the theoretical and actual volume pumped is due to small irregularities in the borehole wall.

Inner Casing

Casing Diameter:	6⅝-inches
Casing Depth:	1,900 feet below pad level
Bit Size:	Nominal 16-inch diameter
Cement Specification:	ASTM C 150 Type II
Number of Stages:	10
Cement Blend:	Neat
Cement Density:	Neat - 15.7 lb./gal
Theoretical Fill From Caliper Log:	511 cubic feet
Volume Pumped:	Neat - 576 cubic feet Total - 576 cubic feet
Percent Difference:	11%

The 6⅝-inch casing was cemented in five stages. After each stage a temperature log was run downhole and the cement physically tagged to determine the actual fill. The difference in the theoretical and actual volume pumped is due to additional cement utilized to small irregularities in the borehole wall.

Casing Hydrostatic Pressure Test
Injection Well No. 1 – 24–inch Casing

Delta Time (minutes)	Pressure (psi)
0	152.0
5	152.0
10	152.0
15	152.0
20	152.0
25	152.0
30	152.0
35	152.25
40	152.25
45	152.25
50	152.25
55	152.25
60	152.25

Date of Test	12/31/01
Witnesses	Albert Muniz H&S John Largey H&S Cameron Webster YBI
Gage Serial No.	IC 123
Gage Certified On	12/27/01
Casing Diameter	24–inches
Packer Depth	2,268 ft (below pad level)
Allowable Pressure Change	5% (7.6 psi)
Actual Pressure Change	0.2% (0.25psi)
Test Result	PRESSURE TEST PASSED

Certified by

Hazen and Sawyer, P.C.

Albert Muniz

Albert Muniz, P.E., No. 35587

APPENDIX M

CASING AND TUBING PRESSURE TESTS

Casing Hydrostatic Pressure Test
Injection Well No. 1 – 16–inch Casing

Delta Time (minutes)	Pressure (psi)
0	153.0
5	153.5
10	154.0
15	154.0
20	155.5
25	155.5
30	156.0
35	156.5
40	157.0
45	157.5
50	158.0
55	158.0
60	159.0

Date of Test	1/11/02
Witnesses	Dan Phelps FDEP Albert Muniz H&S John Largey H&S
Gage Serial No.	IC123
Gage Certified On	12/27/01
Tubing Diameter	16–inches
Packer Depth	2,263 (below pad level)
Allowable Pressure Change	5% (7.65psi)
Actual Pressure Change	3.9% (6.0 psi)
Test Result	PRESSURE TEST PASSED

Certified by

Hazen and Sawyer, P.C.

Albert Muniz

Albert Muniz, P.E., No. 35587

Casing Hydrostatic Pressure Test
Dual–Zone Monitoring Well No. 1 – 16–inch Casing

Delta Time (minutes)	Pressure (psi)
0	151.0
5	151.0
10	151.0
15	151.0
20	151.0
25	151.0
30	151.0
35	151.0
40	151.0
45	151.0
50	151.0
55	151.0
60	151.0

Date of Test	2/11/02
Witnesses	Albert Muniz H&S John Largey H&S
Gage Serial No.	IC120
Gage Certified On	2/6/02
Casing Diameter	16–inches
Packer Depth	1,495 (below pad level)
Allowable Pressure Change	5% (7.55psi)
Actual Pressure Change	0.0% (0.0 psi)
Test Result	PRESSURE TEST PASSED

Certified by

Hazen and Sawyer, P.C.

Albert Muniz

Albert Muniz, P.E., No. 35587

Casing Hydrostatic Pressure Test
Dual–Zone Monitoring Well No. 1 – 6⅝–inch Casing

Delta Time (minutes)	Pressure (psi)
0	156.0
5	156.0
10	156.0
15	155.5
20	155.0
25	155.0
30	155.0
35	154.5
40	154.5
45	154.0
50	154.0
55	154.0
60	153.5

Date of Test	2/19/02
Witnesses	Albert Muniz H&S John Largey H&S
Gage Serial No.	NSN 2
Gage Certified On	2/18/02
Casing Diameter	6⅝–inches
Packer Depth	1,886 (below pad level)
Allowable Pressure Change	5% (7.8psi)
Actual Pressure Change	2.7% (2.5 psi)
Test Result	PRESSURE TEST PASSED

Certified by

Hazen and Sawyer, P.C.

Albert Muniz

Albert Muniz, P.E., No. 35587

Kimball Electronic Laboratory, Inc.
Precision Measurement Equipment Specialists

Certificate of Calibration

Customer: YOUNGQUIST BROTHERS, INC.
Certificate # 100764
Manufacturer: MCDANIEL
Model Number: 200 PSI
Nomenclature: TEST GAUGE
Serial/I.D. # IC123
Specifications: +/- 0.25% FS
Cal. Procedure: MP16/G2
KELI Control # YOU-90777

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. or derived by the ratio type of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

In Tolerance When Received? N   Cal. Tech:091   Relative Humidity: 51%   Temperature: 73 Deg. F

In-House Y   Cal. Cycle: 12 Mos.   Calibration Date: 12/27/2001   Calibration Due: 12/27/2002

Remarks: ADJUSTED TO MEET MANUFACTURERS SPECIFICATIONS

Standards Used

I.D. #		Cal. Date	Cal. Due
609	DRESSER PTE-1 PRESSURE CALIBRATOR	06/21/2001	06/21/2002
610	DRESSER HSQ-2 PRESSURE TRANSDUCER	06/22/2001	06/22/2002

Quality Assurance

Kimball Electronic Laboratory, Inc.
8081 West 21st Lane Hialeah, Florida 33016
ph:(305)822-5792 fax:(305)362-3125

Certificate of Test #100764

Customer: YOUNGQUIST BROTHERS, INC.
Manufacturer: MCDANIEL
Nomenclature: TEST GAUGE

KELI # YOU-90777
Model: 200 PSI
S.N./I.D. IC123

P.O.# STOCK

Range	Nominal	Pre-Cal	Post-Cal	Low Limit	High Limit
200 PSI	40	38.80 out of tol.	39.90	39.5	40.5
	80	77.45 out of tol.	80.00	79.5	80.5
	120	117.35 out of tol.	120.20	119.5	120.5
	160	157.25 out of tol.	160.30	159.5	160.5
	200	197.20 out of tol.	200.40	199.5	200.5

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Labs., Inc. or derived by the ratio of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL 540-1.

Cal. Procedure:MP16/G2 Specifications:+/- 0.25% FS Rcvd. in tol.?N Temp. (F):73.0 R.H.%51.0
Cal. Cycle:365 days Calibration Date:12/27/2001 Calibration Due:12/27/2002 Cal. Tech: 091 In-House: Y
Remarks: ADJUSTED TO MEET MANUFACTURERS SPECIFICATIONS

I.D. #	Standards Used	Cal. Date	Cal. Due
609	DRESSER PTE-1 PRESSURE CALIBRATOR	06/21/2001	06/21/2002
610	DRESSER HSQ-2 PRESSURE TRANSDUCER	06/22/2001	06/22/2002

Quality Assurance

KELI **Kimball Electronic Laboratory, Inc.**

Precision Measurement Equipment Specialists

FILE
40368
MW-1
16"

Certificate of Calibration

Customer:	YOUNGQUIST BROTHERS, INC.
Certificate #	102241
Manufacturer:	MCDANIEL
Model Number:	200 PSI
Nomenclature:	TEST GAUGE
Serial/I.D. #	IC120
Specifications:	+/- 0.25%
Cal. Procedure:	MP16/G2
KELI Control #	YOU-86816

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. or derived by the ratio type of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

In Tolerance When Received? Y   Cal. Tech:091   Relative Humidity: 48%   Temperature: 68 Deg. F

In-House Y   Cal. Cycle: 12 Mos.   Calibration Date: 02/06/2002   Calibration Due: 02/06/2003

Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

I.D. #	Standards Used	Cal. Date	Cal. Due
391	EATON UPS 3000BAA PRESSURE INDICATOR	12/13/2001	12/13/2002

Quality Assurance

FILE
40368
MW-1
16"

Kimball Electronic Laboratory, Inc.

8081 West 21st Lane Hialeah, Florida 33016
ph:(305)822-5792 fax:(305)362-3125

Certificate of Test #102241

Customer: YOUNGQUIST BROTHERS, INC.
Manufacturer: MCDANIEL
Nomenclature: TEST GAUGE

KELI # YOU-86816
Model: 200 PSI
S.N./I.D. IC120

P.O.# STOCK-021

Range	Nominal	Pre-Cal	Post-Cal	Low Limit	High Limit
0-200 PSI	40	40	40	37.5	42.5
	80	80	80	77.5	82.5
	120	120	120	117.5	122.5
	160	160	160	157.5	162.5
	200	200	200	197.5	202.5

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Labs., Inc. or derived by the ratio of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL 540-1.

Cal. Procedure: MP16/G2
Specifications: +/- 0.25%
Temp. (F):68.0 R.H.% 48.0
In-House: Y
Cal. Date: 02/06/2002 Cal. Due: 02/06/2003
Rcvd. in tol.? Y Tech: 091
Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

I.D. #	Standards Used	Cal. Date	Cal. Due
391	EATON UPS 3000BAA PRESSURE INDICATOR	12/13/2001	12/13/2002

Quality Assurance

KELI

Kimball Electronic Laboratory, Inc.

Precision Measurement Equipment Specialists

Certificate of Calibration

FILE
40368

MW-1
6 5/8"

Customer: YOUNGQUIST BROTHERS, INC.
Certificate # 102834
Manufacturer: MCDANIEL
Model Number: 200 PSI
Nomenclature: TEST GAUGE
Serial/I.D. # NSN2
Specifications: 0-200 PSI. +/- .025% FS.
Cal. Procedure: MP16/G2
KELI Control # YOU-02834

> The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. or derived by the ratio type of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

In Tolerance When Received? Y   Cal. Tech:088   Relative Humidity: 50%   Temperature: 70 Deg. F

In-House ☒ Y   Cal. Cycle: 12 Mos.   Calibration Date: 02/18/2002   Calibration Due: 02/18/2003

Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

I.D. #	Standards Used	Cal. Date	Cal. Due
412	EATON UPS 3000DA PRESSURE INDICATOR	12/13/2001	12/13/2002

Lisa King
Quality Assurance

Kimball Electronic Lab., Inc. - 8081 W. 21 Lane - Hialeah, Florida 33016

mil cert 3/01

FILE
40368
MW-1
6 5/8"

Kimball Electronic Laboratory, Inc.

8081 West 21st Lane Hialeah, Florida 33016
ph:(305)822-5792 fax:(305)362-3125

Certificate of Test #102834

Customer: YOUNGQUIST BROTHERS, INC.
KELI # YOU-02834
P.O.# UKN
Manufacturer: MCDANIEL
Model: 200 PSI
Nomenclature: TEST GAUGE
S.N./I.D. NSN2

Range	Nominal	Pre-Cal	Post-Cal	Low Limit	High Limit
0-200 PSI	40	39.5	39.5	37.5	42.5
	80	79.5	79.5	77.5	82.5
	120	120.3	120.3	117.5	122.5
	160	160.5	160.5	157.5	162.5
	200	200.5	200.5	197.5	202.5

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Labs., Inc. or derived by the ratio of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL 540-1.

Cal. Procedure: MP16/G2
Specifications: 0-200 PSI. +/- .025% FS.
Temp. (F): 70.0 R.H.% 50.0
In-House: Y
Cal. Date: 02/18/2002
Cal. Due: 02/18/2003
Rcvd. in tol.? Y
Tech: 088
Remarks: PERFORMED ROUTINE CALIBRATION/CERTIFICATION

I.D. #	Standards Used	Cal. Date	Cal. Due
412	EATON UPS 3000DA PRESSURE INDICATOR	12/13/2001	12/13/2002

Quality Assurance

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APPENDIX N

POSITIVE SEAL PACKER ASSEMBLY

City of Pompano Beach
Concentrate Disposal Well System

Technical Specification
For
YBI Positive Seal Packer

Engineer:

Hazen and Sawyer
2101 Corporate Blvd.
Boca Raton, Florida 33431
561-997-8070

Review Copy

ubmittal No. 02852-004 [illegible]
ontract N. 40368 FURNISH AS CORRECTED ☐
Section ______ REVISE AND RESUBMIT ☐

Checking of shop drawing is limited to general design and eneral arrangement only and is not intended to be a verification of compliance with all requirements. Engineer's review shall not relieve the Contractor from the responsibility of details of esign, correct dimensions for proper fitting, the satisfactory d safe performance of the work, coordination with others' erformance, or any other requirement of the Contract.

HAZEN AND SAWYER, P.C.
______
DATE: 2-6-02

Submitted By:

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, Florida 33908
Phone: (941) 489-4444
Fax: (941) 489-4545

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. # 02852-12-A
Transmittal No. # 024 **Date:** 1/30/02
Signature ______

Technical Specification
For
YBI Positive Seal Packer

Material

ASTM A53 Grade B, Mild Steel

Ring # 1 Outer Mandrel

24” outside diameter with an inside taper of 2 ½ degrees, connections: weld X weld.

Collapse: 288 psi
Burst: 833 psi

Ring # 2: Inner Mandrel

✓ 15” inside diameter, outside diameter tapered of 2 ½ degrees to fit Ring # 1 (Outer Mandrel).

Collapse: 972 psi
Burst: 1,250 psi

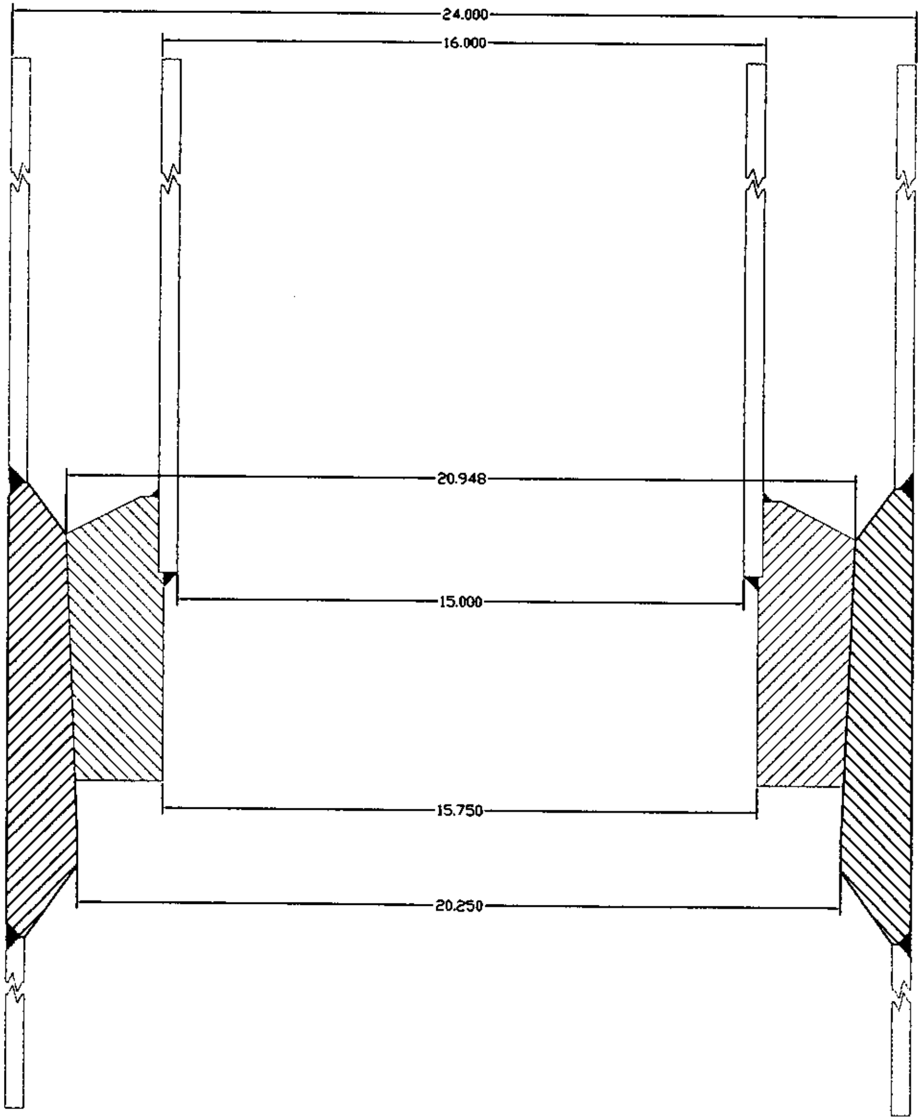
Note: see attached drawing for detail dimensions.

Seal Surface

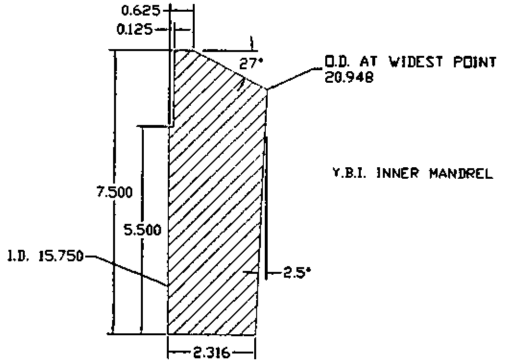
Machined & polished to 16 RMA.

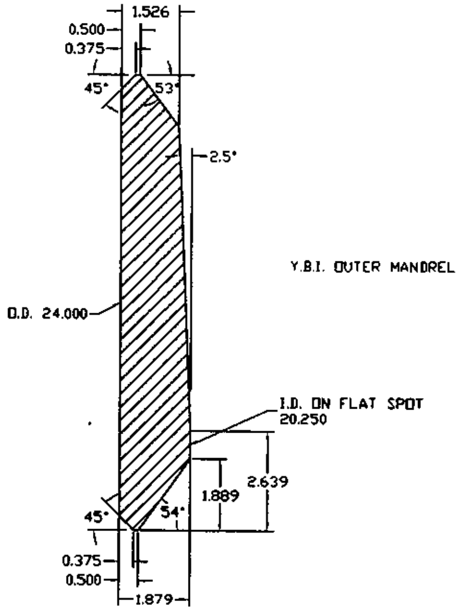
Welding Procedures

As per approved project-welding procedures, by certified welders.



24' O.D. PACKER





SCALE
3.000

Y.B.I. LINER HANGER PACKER

DRAWN BY: PAUL McCULLERS | DRAWN ON: 9 / 9 / 01

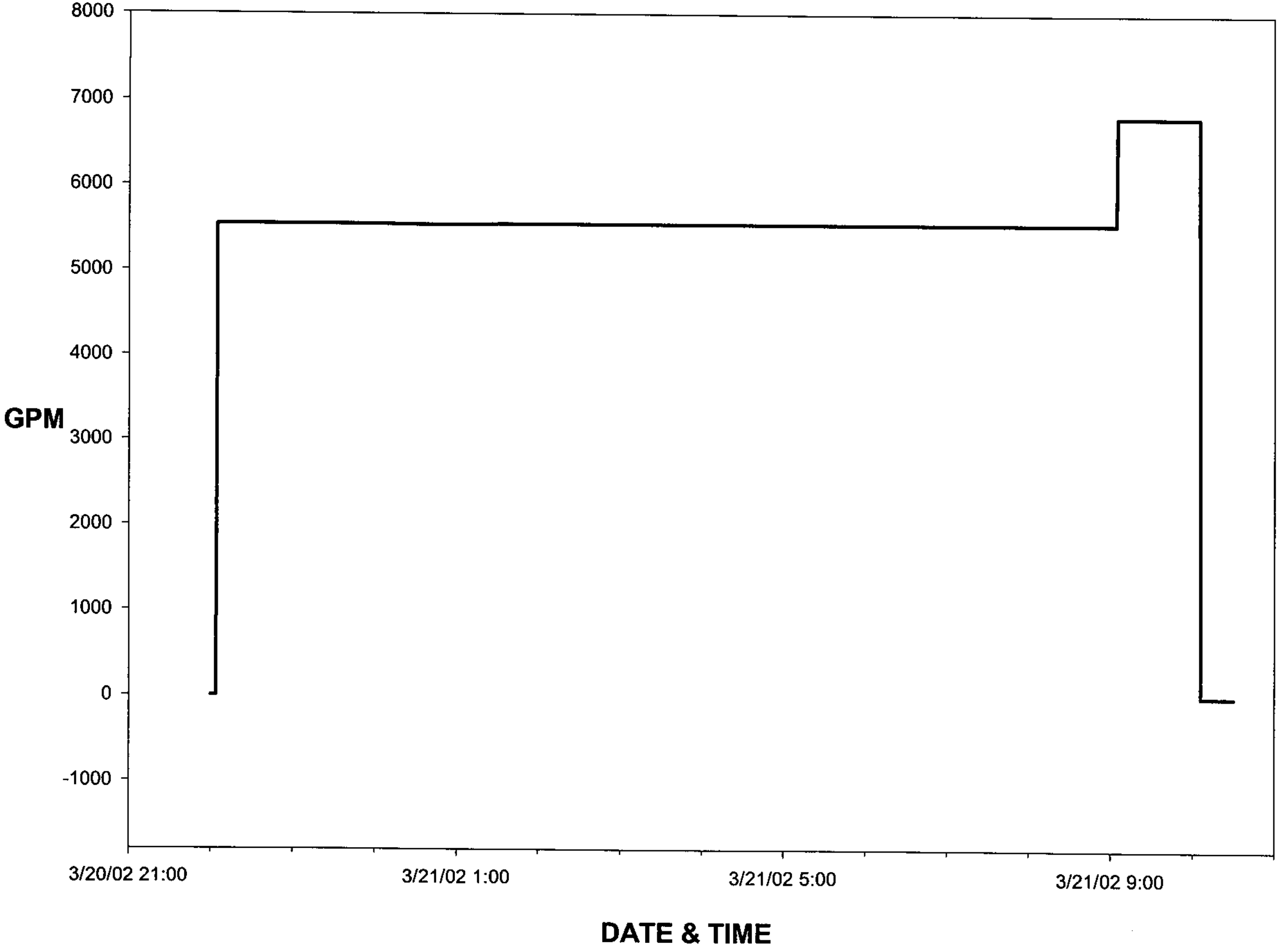
SCALE: 2/9 | SHEET 1 of 1

ALL DIMENSIONS ARE IN INCHES

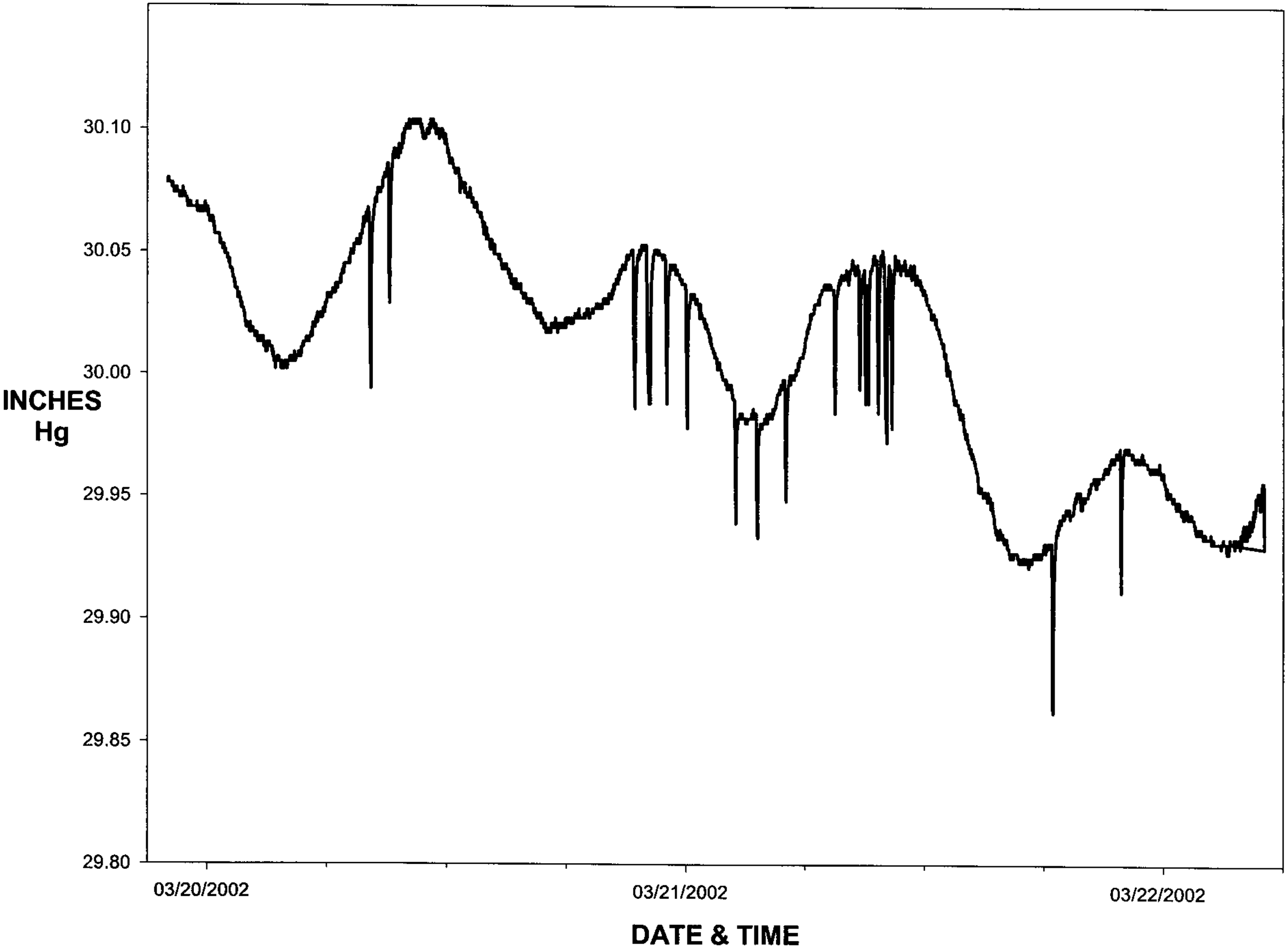
APPENDIX P

INJECTION TEST DATA

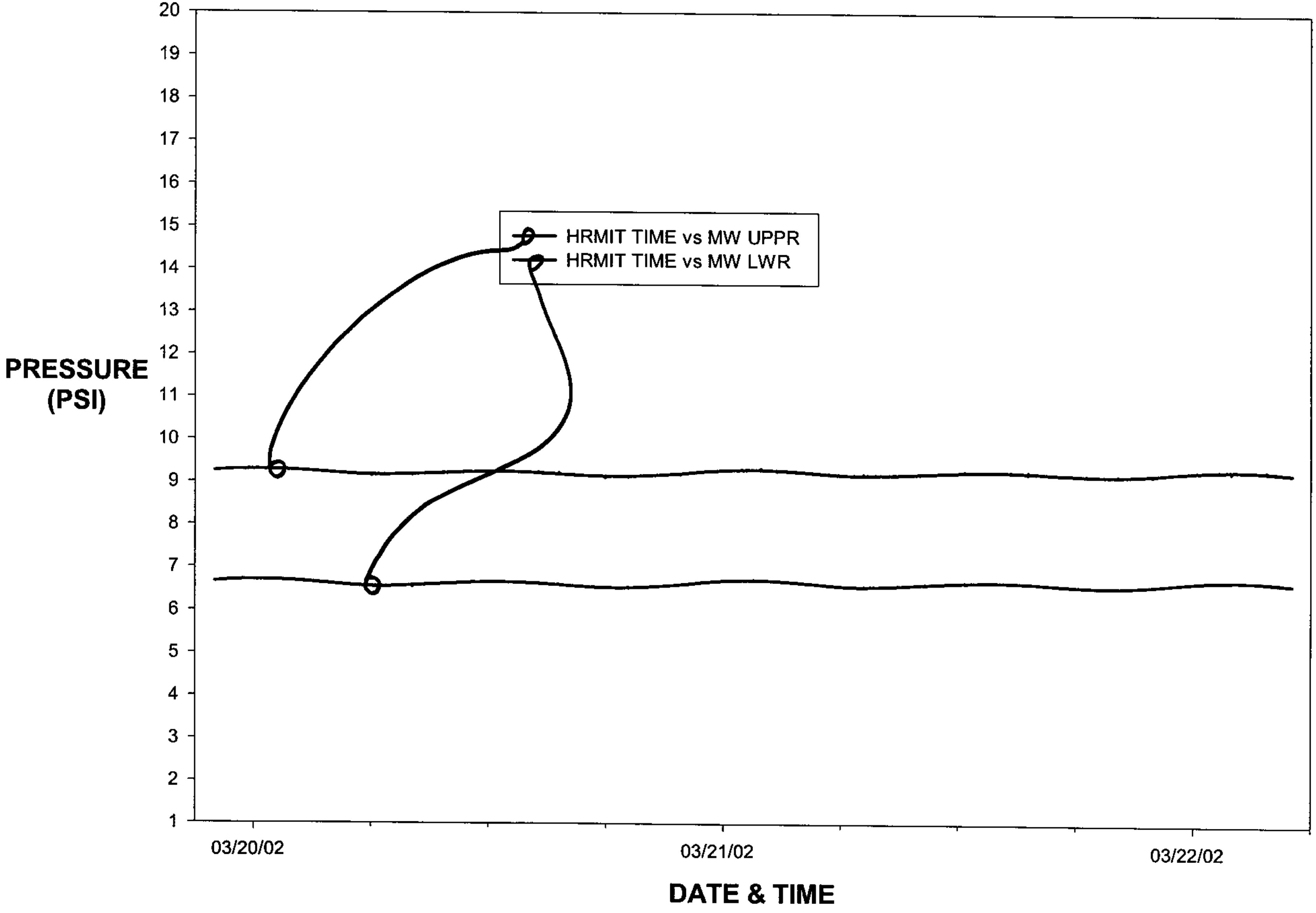
POMPANO BEACH INJECTION WELL #1
INJECTION PHASE FLOWRATE



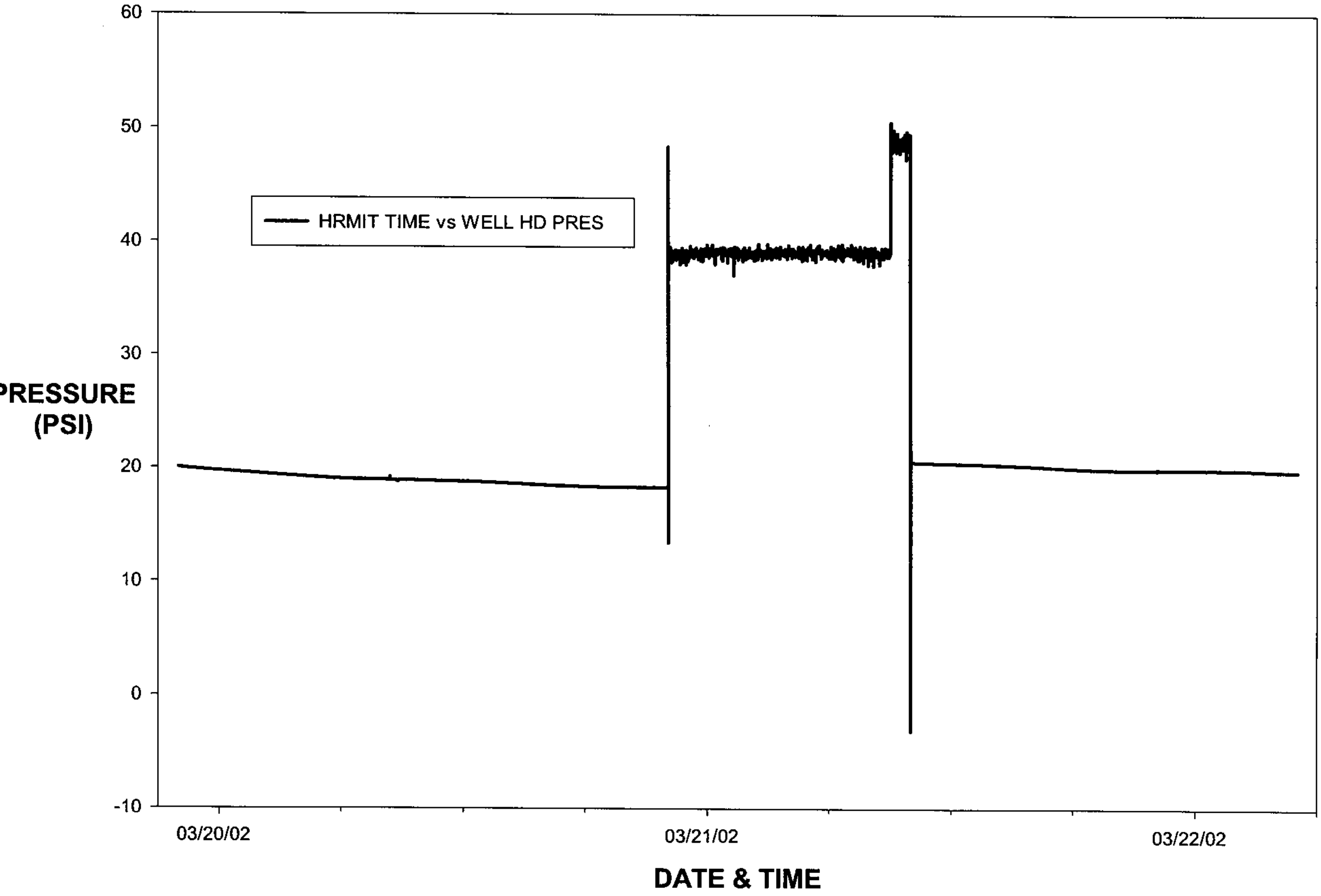
POMPANO BEACH INJECTION WELL #1
BAROMETRIC PRESSURE



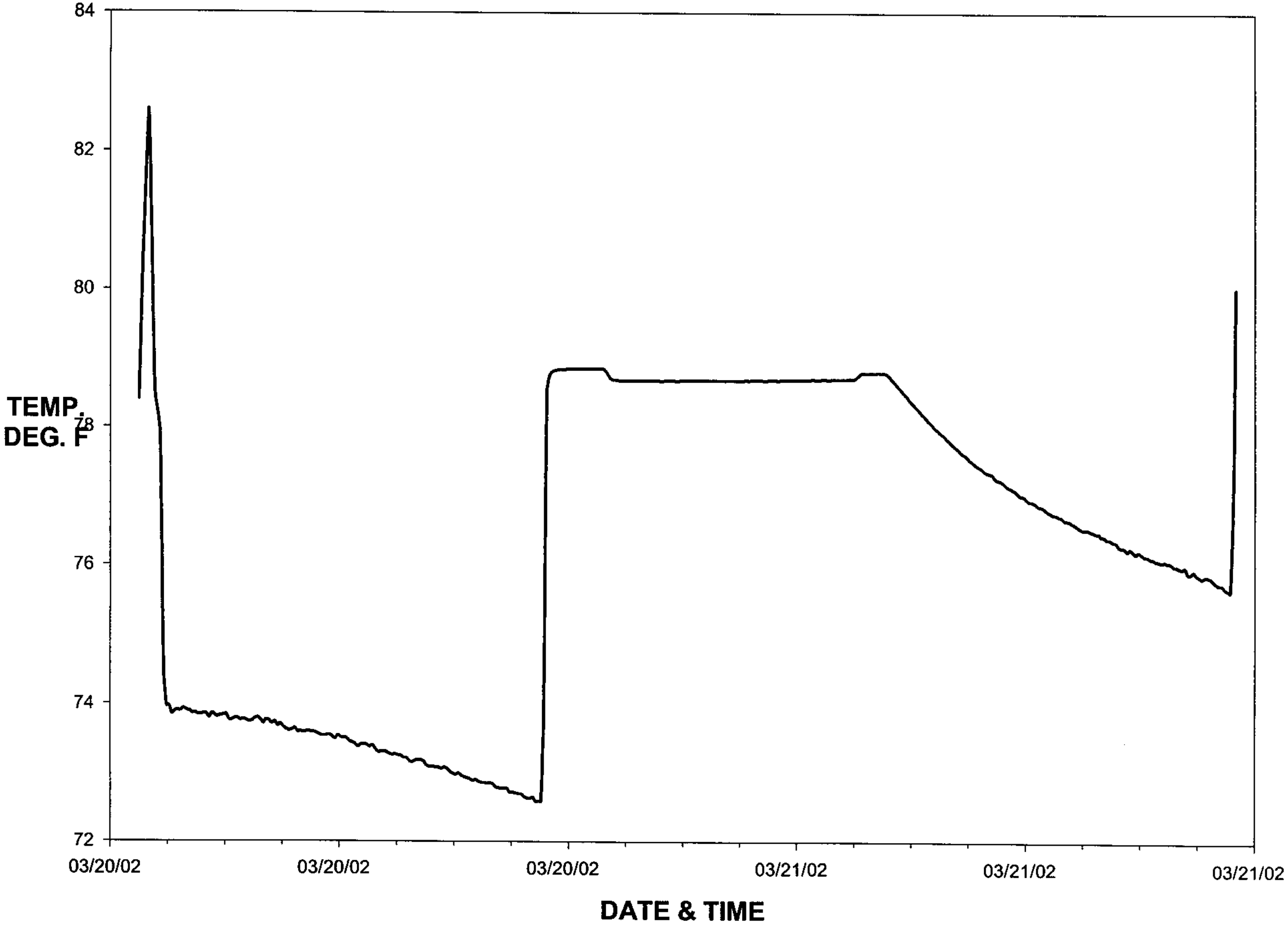
POMPANO INJECTION WELL #1
MONITOR WELL PRESSURE



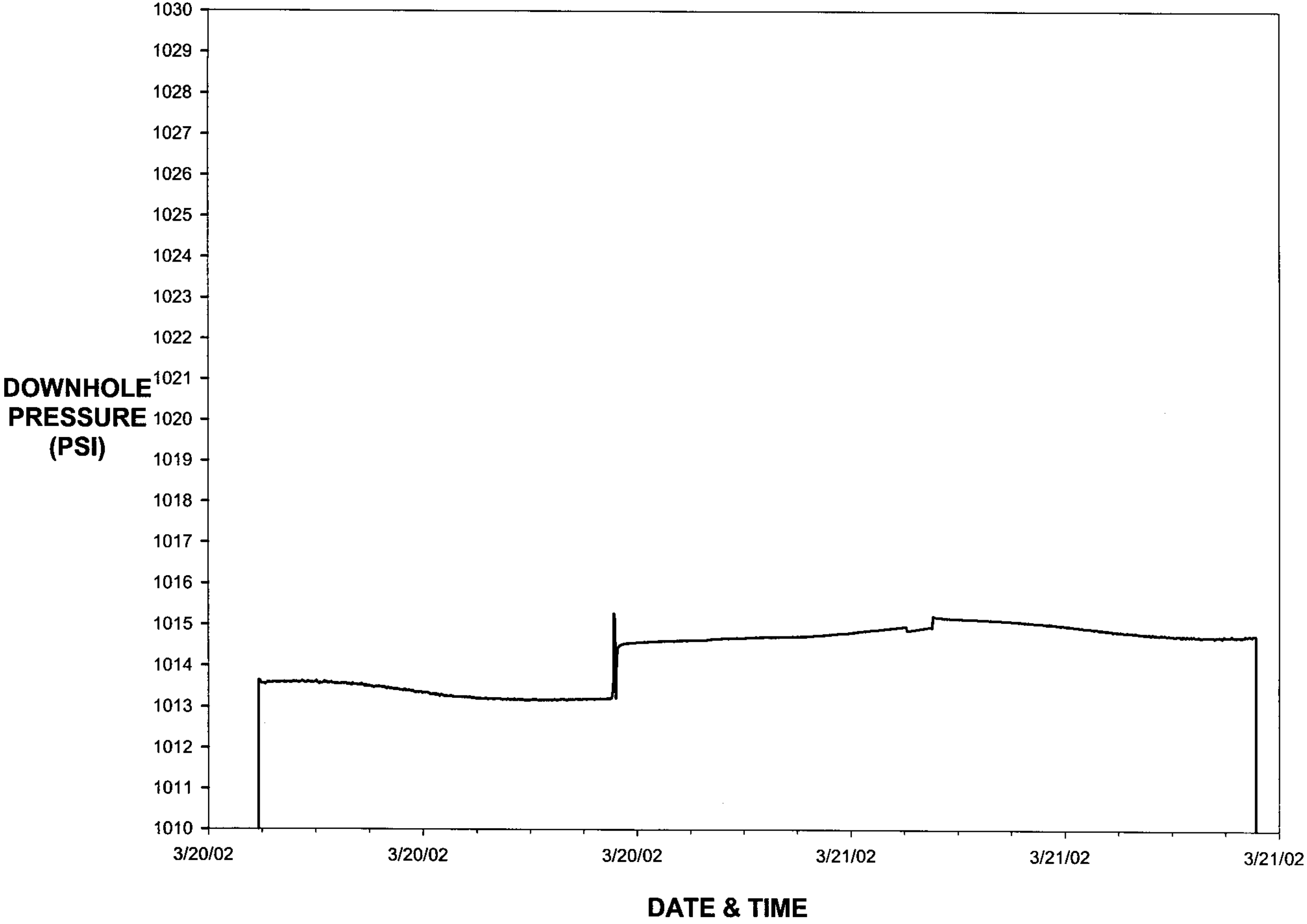
POMPANO BEACH INJECTION WELL #1
WELLHEAD PRESSURE



POMPANO BEACH INJECTION WELL #1
DOWNHOLE TEMPERATURE



POMPANO BEACH INJECTION WELL #1
DOWNHOLE PRESSURE



City of Pompano Beach
Injection Test

Date Time	IW 1 (psi)	MW UPPER (psi)	MW LOWER (psi)	BAROMETRIC Inches Hg
3/19/02 22:00	19.974	9.324	6.725	29.945
3/19/02 22:01	19.968	9.324	6.725	29.945
3/19/02 22:02	19.961	9.324	6.725	29.943
3/19/02 22:03	19.961	9.325	6.727	29.943
3/19/02 22:04	19.955	9.324	6.727	29.943
3/19/02 22:05	19.949	9.327	6.728	29.943
3/19/02 22:06	19.949	9.327	6.729	29.943
3/19/02 22:07	19.943	9.326	6.729	29.943
3/19/02 22:08	19.936	9.327	6.729	29.943
3/19/02 22:09	19.936	9.329	6.73	29.943
3/19/02 22:10	19.93	9.327	6.73	29.943
3/19/02 22:11	19.93	9.329	6.733	29.943
3/19/02 22:12	19.924	9.33	6.733	29.941
3/19/02 22:13	19.924	9.33	6.734	29.941
3/19/02 22:14	19.924	9.331	6.734	29.941
3/19/02 22:15	19.918	9.331	6.734	29.941
3/19/02 22:16	19.911	9.331	6.735	29.941
3/19/02 22:17	19.911	9.331	6.734	29.939
3/19/02 22:18	19.911	9.334	6.737	29.941
3/19/02 22:19	19.899	9.332	6.737	29.939
3/19/02 22:20	19.905	9.334	6.738	29.939
3/19/02 22:21	19.899	9.334	6.739	29.941
3/19/02 22:22	19.893	9.336	6.739	29.939
3/19/02 22:23	19.893	9.335	6.739	29.939
3/19/02 22:24	19.893	9.336	6.74	29.941
3/19/02 22:25	19.893	9.336	6.739	29.941
3/19/02 22:26	19.886	9.336	6.742	29.941
3/19/02 22:27	19.88	9.337	6.74	29.939
3/19/02 22:28	19.88	9.337	6.742	29.939
3/19/02 22:29	19.874	9.339	6.742	29.937
3/19/02 22:30	19.874	9.337	6.743	29.939
3/19/02 22:31	19.861	9.339	6.743	29.939
3/19/02 22:32	19.855	9.339	6.744	29.937
3/19/02 22:33	19.855	9.34	6.744	29.939
3/19/02 22:34	19.849	9.34	6.745	29.939
3/19/02 22:35	19.849	9.34	6.745	29.939
3/19/02 22:36	19.849	9.344	6.745	29.939
3/19/02 22:37	19.849	9.34	6.745	29.941
3/19/02 22:38	19.83	9.345	6.747	29.939
3/19/02 22:39	19.824	9.34	6.748	29.939
3/19/02 22:40	19.837	9.345	6.748	29.939
3/19/02 22:41	19.837	9.34	6.749	29.939
3/19/02 22:42	19.837	9.345	6.748	29.939
3/19/02 22:43	19.837	9.345	6.749	29.939
3/19/02 22:44	19.83	9.345	6.749	29.939
3/19/02 22:45	19.83	9.345	6.75	29.937
3/19/02 22:46	19.83	9.346	6.75	29.937
3/19/02 22:47	19.824	9.346	6.75	29.939
3/19/02 22:48	19.824	9.346	6.752	29.939
3/19/02 22:49	19.818	9.347	6.752	29.939
3/19/02 22:50	19.818	9.346	6.752	29.939
3/19/02 22:51	19.818	9.347	6.753	29.937
3/19/02 22:52	19.812	9.347	6.753	29.937
3/19/02 22:53	19.805	9.349	6.753	29.935
3/19/02 22:54	19.799	9.349	6.754	29.939
3/19/02 22:55	19.799	9.349	6.754	29.937
3/19/02 22:56	19.799	9.349	6.755	29.935
3/19/02 22:57	19.799	9.349	6.755	29.935
3/19/02 22:58	19.799	9.35	6.755	29.933
3/19/02 22:59	19.799	9.35	6.757	29.935
3/19/02 23:00	19.793	9.35	6.757	29.935
3/19/02 23:01	19.793	9.351	6.757	29.935
3/19/02 23:02	19.787	9.354	6.757	29.935
3/19/02 23:03	19.787	9.354	6.758	29.933
3/19/02 23:04	19.787	9.354	6.758	29.935
3/19/02 23:05	19.78	9.351	6.758	29.935
3/19/02 23:06	19.787	9.351	6.759	29.935
3/19/02 23:07	19.78	9.354	6.759	29.935
3/19/02 23:08	19.78	9.354	6.759	29.933
3/19/02 23:09	19.774	9.354	6.759	29.933
3/19/02 23:10	19.774	9.354	6.76	29.933
3/19/02 23:11	19.768	9.355	6.76	29.935
3/19/02 23:12	19.78	9.352	6.759	29.933
3/19/02 23:13	19.774	9.351	6.762	29.931
3/19/02 23:14	19.768	9.354	6.762	29.931
3/19/02 23:15	19.768	9.355	6.762	29.935
3/19/02 23:16	19.762	9.355	6.762	29.935
3/19/02 23:17	19.755	9.355	6.762	29.931
3/19/02 23:18	19.749	9.356	6.762	29.931
3/19/02 23:19	19.749	9.356	6.762	29.931
3/19/02 23:20	19.755	9.355	6.762	29.933
3/19/02 23:21	19.755	9.356	6.762	29.931
3/19/02 23:22	19.749	9.355	6.762	29.933
3/19/02 23:23	19.749	9.356	6.762	29.933
3/19/02 23:24	19.749	9.355	6.763	29.933
3/19/02 23:25	19.743	9.356	6.763	29.933
3/19/02 23:26	19.743	9.356	6.762	29.933
3/19/02 23:27	19.743	9.356	6.763	29.933
3/19/02 23:28	19.737	9.356	6.763	29.933
3/19/02 23:29	19.737	9.356	6.763	29.931
3/19/02 23:30	19.737	9.356	6.764	29.933
3/19/02 23:31	19.73	9.357	6.764	29.931
3/19/02 23:32	19.724	9.356	6.763	29.933
3/19/02 23:33	19.724	9.359	6.763	29.933
3/19/02 23:34	19.724	9.357	6.764	29.933
3/19/02 23:35	19.718	9.356	6.764	29.933
3/19/02 23:36	19.718	9.357	6.764	29.933
3/19/02 23:37	19.712	9.357	6.764	29.931
3/19/02 23:38	19.712	9.356	6.764	29.933
3/19/02 23:39	19.712	9.356	6.763	29.933
3/19/02 23:40	19.712	9.356	6.764	29.929
3/19/02 23:41	19.712	9.355	6.763	29.931
3/19/02 23:42	19.712	9.356	6.763	29.931
3/19/02 23:43	19.699	9.356	6.764	29.931
3/19/02 23:44	19.699	9.359	6.764	29.931
3/19/02 23:45	19.718	9.355	6.764	29.931
3/19/02 23:46	19.699	9.357	6.764	29.933
3/19/02 23:47	19.693	9.356	6.764	29.931
3/19/02 23:48	19.693	9.357	6.764	29.931
3/19/02 23:49	19.693	9.356	6.764	29.931
3/19/02 23:50	19.693	9.359	6.764	29.931
3/19/02 23:51	19.687	9.359	6.764	29.933
3/19/02 23:52	19.687	9.357	6.764	29.933
3/19/02 23:53	19.68	9.359	6.764	29.933
3/19/02 23:54	19.674	9.356	6.764	29.933
3/19/02 23:55	19.674	9.357	6.764	29.931
3/19/02 23:56	19.674	9.357	6.764	29.933
3/19/02 23:57	19.668	9.357	6.764	29.931
3/19/02 23:58	19.668	9.359	6.764	29.933
3/19/02 23:59	19.668	9.359	6.764	29.933
3/20/02 0:00	19.668	9.357	6.764	29.933
3/20/02 0:01	19.662	9.359	6.764	29.931
3/20/02 0:02	19.668	9.359	6.764	29.931
3/20/02 0:03	19.662	9.359	6.764	29.931
3/20/02 0:04	19.662	9.359	6.764	29.929
3/20/02 0:05	19.662	9.357	6.764	29.931
3/20/02 0:06	19.655	9.357	6.764	29.929
3/20/02 0:07	19.649	9.357	6.764	29.929
3/20/02 0:08	19.655	9.359	6.764	29.929
3/20/02 0:09	19.649	9.357	6.764	29.927
3/20/02 0:10	19.643	9.354	6.764	29.929
3/20/02 0:11	19.649	9.369	6.764	29.929
3/20/02 0:12	19.637	9.355	6.764	29.929
3/20/02 0:13	19.643	9.36	6.764	29.929
3/20/02 0:14	19.637	9.359	6.764	29.927
3/20/02 0:15	19.637	9.357	6.764	29.927
3/20/02 0:16	19.637	9.357	6.764	29.927
3/20/02 0:17	19.63	9.359	6.764	29.929
3/20/02 0:18	19.637	9.359	6.764	29.927
3/20/02 0:19	19.63	9.357	6.764	29.927
3/20/02 0:20	19.637	9.359	6.764	29.925
3/20/02 0:21	19.624	9.357	6.764	29.927
3/20/02 0:22	19.624	9.357	6.764	29.925
3/20/02 0:23	19.624	9.357	6.764	29.921
3/20/02 0:24	19.612	9.359	6.764	29.923
3/20/02 0:25	19.618	9.357	6.764	29.921
3/20/02 0:26	19.612	9.359	6.764	29.923
3/20/02 0:27	19.612	9.359	6.764	29.919
3/20/02 0:28	19.612	9.357	6.764	29.923
3/20/02 0:29	19.612	9.357	6.763	29.923
3/20/02 0:30	19.606	9.357	6.764	29.923
3/20/02 0:31	19.612	9.357	6.764	29.921
3/20/02 0:32	19.606	9.357	6.763	29.923
3/20/02 0:33	19.599	9.356	6.763	29.923
3/20/02 0:34	19.599	9.356	6.763	29.923
3/20/02 0:35	19.599	9.356	6.763	29.923
3/20/02 0:36	19.599	9.359	6.764	29.923
3/20/02 0:37	19.599	9.356	6.763	29.923
3/20/02 0:38	19.599	9.357	6.763	29.919
3/20/02 0:39	19.593	9.357	6.763	29.921
3/20/02 0:40	19.593	9.356	6.763	29.921
3/20/02 0:41	19.587	9.359	6.763	29.917
3/20/02 0:42	19.587	9.357	6.763	29.919
3/20/02 0:43	19.587	9.357	6.763	29.919
3/20/02 0:44	19.581	9.357	6.763	29.917
3/20/02 0:45	19.581	9.356	6.763	29.921
3/20/02 0:46	19.581	9.359	6.763	29.919
3/20/02 0:47	19.581	9.356	6.762	29.917
3/20/02 0:48	19.568	9.357	6.762	29.917
3/20/02 0:49	19.568	9.356	6.762	29.917
3/20/02 0:50	19.568	9.357	6.762	29.919
3/20/02 0:51	19.568	9.356	6.762	29.919
3/20/02 0:52	19.562	9.357	6.762	29.917
3/20/02 0:53	19.562	9.356	6.76	29.917
3/20/02 0:54	19.562	9.356	6.762	29.917
3/20/02 0:55	19.562	9.355	6.76	29.917
3/20/02 0:56	19.562	9.356	6.76	29.915
3/20/02 0:57	19.562	9.355	6.76	29.915
3/20/02 0:58	19.556	9.354	6.76	29.915

City of Pompano Beach
Injection Test

	IW 1	MW UPPER	MW LOWER	BAROMETRIC
Date Time	PSI	PSI	PSI	Inches Hg
3/20/02 0:59	19.549	9.354	6.759	29.915
3/20/02 1:00	19.549	9.355	6.759	29.915
3/20/02 1:01	19.549	9.356	6.759	29.915
3/20/02 1:02	19.543	9.354	6.759	29.915
3/20/02 1:03	19.537	9.354	6.759	29.911
3/20/02 1:04	19.543	9.354	6.758	29.913
3/20/02 1:05	19.537	9.356	6.759	29.913
3/20/02 1:06	19.524	9.354	6.758	29.913
3/20/02 1:07	19.524	9.354	6.758	29.911
3/20/02 1:08	19.518	9.355	6.758	29.911
3/20/02 1:09	19.518	9.354	6.758	29.909
3/20/02 1:10	19.524	9.352	6.757	29.909
3/20/02 1:11	19.512	9.351	6.757	29.909
3/20/02 1:12	19.512	9.352	6.757	29.907
3/20/02 1:13	19.512	9.352	6.757	29.909
3/20/02 1:14	19.512	9.352	6.757	29.909
3/20/02 1:15	19.512	9.352	6.757	29.909
3/20/02 1:16	19.506	9.351	6.755	29.907
3/20/02 1:17	19.506	9.352	6.755	29.907
3/20/02 1:18	19.506	9.351	6.755	29.907
3/20/02 1:19	19.499	9.352	6.755	29.905
3/20/02 1:20	19.506	9.352	6.755	29.905
3/20/02 1:21	19.499	9.351	6.754	29.905
3/20/02 1:22	19.499	9.351	6.754	29.903
3/20/02 1:23	19.493	9.351	6.754	29.903
3/20/02 1:24	19.493	9.35	6.754	29.903
3/20/02 1:25	19.487	9.351	6.754	29.901
3/20/02 1:26	19.487	9.351	6.753	29.901
3/20/02 1:27	19.481	9.351	6.753	29.903
3/20/02 1:28	19.481	9.351	6.753	29.901
3/20/02 1:29	19.481	9.35	6.753	29.901
3/20/02 1:30	19.481	9.349	6.753	29.899
3/20/02 1:31	19.481	9.35	6.753	29.899
3/20/02 1:32	19.481	9.349	6.752	29.899
3/20/02 1:33	19.474	9.349	6.752	29.897
3/20/02 1:34	19.474	9.349	6.752	29.897
3/20/02 1:35	19.474	9.349	6.752	29.899
3/20/02 1:36	19.474	9.349	6.752	29.899
3/20/02 1:37	19.474	9.349	6.75	29.897
3/20/02 1:38	19.468	9.349	6.75	29.895
3/20/02 1:39	19.462	9.349	6.75	29.895
3/20/02 1:40	19.456	9.349	6.75	29.895
3/20/02 1:41	19.456	9.347	6.749	29.895
3/20/02 1:42	19.456	9.347	6.75	29.893
3/20/02 1:43	19.449	9.346	6.749	29.893
3/20/02 1:44	19.456	9.347	6.748	29.893
3/20/02 1:45	19.449	9.344	6.748	29.895
3/20/02 1:46	19.443	9.349	6.748	29.891
3/20/02 1:47	19.431	9.35	6.749	29.891
3/20/02 1:48	19.437	9.339	6.747	29.891
3/20/02 1:49	19.437	9.341	6.747	29.891
3/20/02 1:50	19.437	9.344	6.745	29.891
3/20/02 1:51	19.437	9.344	6.745	29.891
3/20/02 1:52	19.431	9.342	6.745	29.886
3/20/02 1:53	19.431	9.341	6.744	29.888
3/20/02 1:54	19.431	9.342	6.744	29.884
3/20/02 1:55	19.431	9.342	6.744	29.886
3/20/02 1:56	19.431	9.342	6.744	29.886
3/20/02 1:57	19.431	9.341	6.743	29.884
3/20/02 1:58	19.424	9.341	6.743	29.884
3/20/02 1:59	19.424	9.341	6.743	29.882
3/20/02 2:00	19.418	9.34	6.742	29.886
3/20/02 2:01	19.424	9.34	6.742	29.886
3/20/02 2:02	19.418	9.34	6.742	29.884
3/20/02 2:03	19.418	9.341	6.739	29.886
3/20/02 2:04	19.412	9.337	6.739	29.884
3/20/02 2:05	19.412	9.337	6.739	29.882
3/20/02 2:06	19.406	9.339	6.738	29.882
3/20/02 2:07	19.412	9.337	6.737	29.882
3/20/02 2:08	19.406	9.337	6.738	29.884
3/20/02 2:09	19.406	9.337	6.737	29.882
3/20/02 2:10	19.406	9.337	6.735	29.882
3/20/02 2:11	19.406	9.336	6.735	29.882
3/20/02 2:12	19.4	9.337	6.735	29.882
3/20/02 2:13	19.393	9.335	6.735	29.88
3/20/02 2:14	19.393	9.334	6.734	29.882
3/20/02 2:15	19.387	9.335	6.733	29.882
3/20/02 2:16	19.381	9.334	6.733	29.882
3/20/02 2:17	19.381	9.334	6.733	29.882
3/20/02 2:18	19.375	9.332	6.732	29.884
3/20/02 2:19	19.375	9.332	6.732	29.882
3/20/02 2:20	19.375	9.332	6.732	29.882
3/20/02 2:21	19.375	9.331	6.73	29.882
3/20/02 2:22	19.375	9.332	6.73	29.882
3/20/02 2:23	19.375	9.331	6.73	29.88
3/20/02 2:24	19.362	9.331	6.729	29.88
3/20/02 2:25	19.362	9.332	6.728	29.88
3/20/02 2:26	19.356	9.329	6.728	29.88
3/20/02 2:27	19.35	9.33	6.728	29.878
3/20/02 2:28	19.356	9.329	6.728	29.88
3/20/02 2:29	19.35	9.329	6.727	29.878
3/20/02 2:30	19.35	9.329	6.727	29.88
3/20/02 2:31	19.35	9.327	6.725	29.88
3/20/02 2:32	19.356	9.329	6.725	29.878
3/20/02 2:33	19.35	9.325	6.723	29.88
3/20/02 2:34	19.343	9.327	6.725	29.88
3/20/02 2:35	19.343	9.326	6.724	29.878
3/20/02 2:36	19.337	9.326	6.723	29.878
3/20/02 2:37	19.337	9.325	6.723	29.878
3/20/02 2:38	19.337	9.324	6.722	29.878
3/20/02 2:39	19.337	9.324	6.722	29.878
3/20/02 2:40	19.331	9.322	6.722	29.878
3/20/02 2:41	19.325	9.322	6.72	29.88
3/20/02 2:42	19.331	9.322	6.719	29.878
3/20/02 2:43	19.331	9.322	6.718	29.88
3/20/02 2:44	19.325	9.321	6.718	29.876
3/20/02 2:45	19.318	9.321	6.718	29.878
3/20/02 2:46	19.318	9.32	6.718	29.878
3/20/02 2:47	19.318	9.32	6.717	29.878
3/20/02 2:48	19.312	9.32	6.715	29.88
3/20/02 2:49	19.312	9.317	6.715	29.878
3/20/02 2:50	19.306	9.319	6.715	29.878
3/20/02 2:51	19.306	9.319	6.715	29.878
3/20/02 2:52	19.3	9.317	6.714	29.878
3/20/02 2:53	19.3	9.316	6.714	29.876
3/20/02 2:54	19.306	9.316	6.713	29.878
3/20/02 2:55	19.3	9.316	6.713	29.878
3/20/02 2:56	19.3	9.316	6.713	29.876
3/20/02 2:57	19.287	9.315	6.712	29.876
3/20/02 2:58	19.293	9.316	6.712	29.876
3/20/02 2:59	19.293	9.315	6.712	29.874
3/20/02 3:00	19.287	9.315	6.71	29.876
3/20/02 3:01	19.287	9.315	6.709	29.874
3/20/02 3:02	19.293	9.312	6.709	29.876
3/20/02 3:03	19.287	9.312	6.708	29.876
3/20/02 3:04	19.281	9.312	6.708	29.876
3/20/02 3:05	19.275	9.312	6.705	29.876
3/20/02 3:06	19.275	9.309	6.704	29.876
3/20/02 3:07	19.275	9.309	6.704	29.876
3/20/02 3:08	19.275	9.307	6.704	29.876
3/20/02 3:09	19.268	9.307	6.703	29.874
3/20/02 3:10	19.268	9.309	6.703	29.876
3/20/02 3:11	19.262	9.309	6.702	29.876
3/20/02 3:12	19.262	9.309	6.702	29.874
3/20/02 3:13	19.256	9.307	6.7	29.876
3/20/02 3:14	19.262	9.306	6.7	29.876
3/20/02 3:15	19.256	9.306	6.702	29.874
3/20/02 3:16	19.256	9.304	6.699	29.876
3/20/02 3:17	19.25	9.306	6.699	29.874
3/20/02 3:18	19.25	9.306	6.699	29.872
3/20/02 3:19	19.256	9.304	6.698	29.87
3/20/02 3:20	19.25	9.305	6.698	29.87
3/20/02 3:21	19.25	9.302	6.697	29.87
3/20/02 3:22	19.243	9.304	6.697	29.868
3/20/02 3:23	19.237	9.301	6.697	29.87
3/20/02 3:24	19.237	9.302	6.695	29.87
3/20/02 3:25	19.231	9.302	6.695	29.87
3/20/02 3:26	19.231	9.3	6.693	29.866
3/20/02 3:27	19.231	9.301	6.694	29.87
3/20/02 3:28	19.225	9.299	6.693	29.868
3/20/02 3:29	19.218	9.3	6.693	29.87
3/20/02 3:30	19.225	9.301	6.693	29.868
3/20/02 3:31	19.225	9.299	6.692	29.87
3/20/02 3:32	19.218	9.297	6.69	29.87
3/20/02 3:33	19.218	9.297	6.689	29.87
3/20/02 3:34	19.218	9.295	6.689	29.87
3/20/02 3:35	19.218	9.294	6.688	29.872
3/20/02 3:36	19.218	9.295	6.688	29.87
3/20/02 3:37	19.218	9.299	6.687	29.87
3/20/02 3:38	19.15	9.289	6.687	29.87
3/20/02 3:39	19.206	9.296	6.687	29.868
3/20/02 3:40	19.212	9.294	6.685	29.87
3/20/02 3:41	19.212	9.292	6.684	29.868
3/20/02 3:42	19.206	9.294	6.684	29.868
3/20/02 3:43	19.2	9.294	6.683	29.868
3/20/02 3:44	19.2	9.291	6.683	29.868
3/20/02 3:45	19.2	9.291	6.683	29.868
3/20/02 3:46	19.2	9.291	6.682	29.868
3/20/02 3:47	19.187	9.29	6.682	29.868
3/20/02 3:48	19.187	9.29	6.682	29.868
3/20/02 3:49	19.187	9.29	6.68	29.87
3/20/02 3:50	19.187	9.289	6.679	29.868
3/20/02 3:51	19.187	9.289	6.679	29.87
3/20/02 3:52	19.181	9.287	6.678	29.868
3/20/02 3:53	19.181	9.289	6.678	29.868
3/20/02 3:54	19.175	9.286	6.677	29.868
3/20/02 3:55	19.169	9.284	6.677	29.868
3/20/02 3:56	19.169	9.284	6.675	29.868
3/20/02 3:57	19.169	9.277	6.675	29.87
3/20/02 3:58	19.162	9.291	6.675	29.868

City of Pompano Beach
Injection Test

	IW 1	MW UPPER	MW LOWER	BAROMETRIC
Date Time	PSI	PSI	PSI	Inches Hg
3/20/02 3:59	19.162	9.287	6.674	29.868
3/20/02 4:00	19.162	9.281	6.674	29.868
3/20/02 4:01	19.162	9.282	6.673	29.868
3/20/02 4:02	19.156	9.281	6.673	29.87
3/20/02 4:03	19.156	9.282	6.672	29.868
3/20/02 4:04	19.156	9.279	6.672	29.868
3/20/02 4:05	19.156	9.281	6.669	29.87
3/20/02 4:06	19.156	9.28	6.668	29.872
3/20/02 4:07	19.15	9.279	6.668	29.87
3/20/02 4:08	19.15	9.277	6.667	29.87
3/20/02 4:09	19.144	9.277	6.665	29.87
3/20/02 4:10	19.144	9.276	6.665	29.87
3/20/02 4:11	19.144	9.277	6.665	29.87
3/20/02 4:12	19.144	9.277	6.664	29.87
3/20/02 4:13	19.144	9.277	6.664	29.872
3/20/02 4:14	19.137	9.276	6.662	29.87
3/20/02 4:15	19.137	9.274	6.663	29.87
3/20/02 4:16	19.131	9.274	6.662	29.87
3/20/02 4:17	19.131	9.272	6.662	29.872
3/20/02 4:18	19.131	9.276	6.66	29.87
3/20/02 4:19	19.137	9.271	6.66	29.87
3/20/02 4:20	19.125	9.272	6.66	29.872
3/20/02 4:21	19.131	9.272	6.659	29.87
3/20/02 4:22	19.125	9.27	6.658	29.872
3/20/02 4:23	19.125	9.271	6.658	29.87
3/20/02 4:24	19.119	9.271	6.658	29.87
3/20/02 4:25	19.119	9.27	6.658	29.872
3/20/02 4:26	19.112	9.27	6.657	29.872
3/20/02 4:27	19.112	9.269	6.655	29.87
3/20/02 4:28	19.112	9.269	6.655	29.87
3/20/02 4:29	19.112	9.267	6.654	29.872
3/20/02 4:30	19.106	9.267	6.654	29.872
3/20/02 4:31	19.106	9.267	6.654	29.872
3/20/02 4:32	19.106	9.265	6.653	29.872
3/20/02 4:33	19.1	9.265	6.653	29.872
3/20/02 4:34	19.106	9.265	6.652	29.874
3/20/02 4:35	19.1	9.265	6.65	29.872
3/20/02 4:36	19.1	9.264	6.65	29.874
3/20/02 4:37	19.094	9.265	6.652	29.874
3/20/02 4:38	19.094	9.264	6.65	29.872
3/20/02 4:39	19.094	9.265	6.65	29.874
3/20/02 4:40	19.094	9.264	6.649	29.872
3/20/02 4:41	19.094	9.262	6.648	29.874
3/20/02 4:42	19.094	9.261	6.648	29.872
3/20/02 4:43	19.087	9.261	6.647	29.874
3/20/02 4:44	19.081	9.26	6.647	29.876
3/20/02 4:45	19.081	9.261	6.645	29.874
3/20/02 4:46	19.081	9.26	6.645	29.876
3/20/02 4:47	19.075	9.26	6.645	29.876
3/20/02 4:48	19.075	9.257	6.644	29.876
3/20/02 4:49	19.069	9.257	6.643	29.876
3/20/02 4:50	19.075	9.256	6.643	29.878
3/20/02 4:51	19.069	9.257	6.643	29.878
3/20/02 4:52	19.069	9.257	6.642	29.878
3/20/02 4:53	19.075	9.255	6.642	29.878
3/20/02 4:54	19.094	9.28	6.64	29.876
3/20/02 4:55	19.062	9.256	6.64	29.876
3/20/02 4:56	19.062	9.256	6.639	29.878
3/20/02 4:57	19.05	9.255	6.639	29.878
3/20/02 4:58	19.056	9.254	6.638	29.88
3/20/02 4:59	19.056	9.252	6.638	29.88
3/20/02 5:00	19.056	9.252	6.637	29.88
3/20/02 5:01	19.056	9.252	6.638	29.878
3/20/02 5:02	19.056	9.252	6.637	29.882
3/20/02 5:03	19.056	9.252	6.635	29.878
3/20/02 5:04	19.044	9.252	6.635	29.878
3/20/02 5:05	19.044	9.251	6.637	29.88
3/20/02 5:06	19.044	9.25	6.635	29.878
3/20/02 5:07	19.044	9.25	6.635	29.88
3/20/02 5:08	19.044	9.25	6.633	29.878
3/20/02 5:09	19.044	9.25	6.633	29.88
3/20/02 5:10	19.037	9.25	6.633	29.88
3/20/02 5:11	19.037	9.249	6.632	29.878
3/20/02 5:12	19.031	9.247	6.632	29.878
3/20/02 5:13	19.031	9.246	6.63	29.88
3/20/02 5:14	19.031	9.247	6.63	29.882
3/20/02 5:15	19.031	9.246	6.629	29.882
3/20/02 5:16	19.031	9.245	6.629	29.882
3/20/02 5:17	19.031	9.246	6.628	29.884
3/20/02 5:18	19.025	9.244	6.628	29.884
3/20/02 5:19	19.025	9.244	6.627	29.884
3/20/02 5:20	19.031	9.244	6.627	29.884
3/20/02 5:21	19.025	9.242	6.627	29.882
3/20/02 5:22	19.012	9.244	6.627	29.884
3/20/02 5:23	19.012	9.241	6.625	29.886
3/20/02 5:24	19.006	9.242	6.625	29.886
3/20/02 5:25	19.012	9.242	6.625	29.886
3/20/02 5:26	19.012	9.241	6.624	29.886
3/20/02 5:27	19.012	9.241	6.624	29.884
3/20/02 5:28	19.012	9.236	6.624	29.891
Date Time	PSI	PSI	PSI	Inches Hg
3/20/02 5:29	19.006	9.241	6.623	29.884
3/20/02 5:30	19.006	9.241	6.623	29.888
3/20/02 5:31	19.006	9.242	6.623	29.888
3/20/02 5:32	19	9.238	6.623	29.888
3/20/02 5:33	19	9.238	6.622	29.884
3/20/02 5:34	19	9.238	6.622	29.891
3/20/02 5:35	19	9.238	6.622	29.888
3/20/02 5:36	18.994	9.238	6.62	29.888
3/20/02 5:37	18.994	9.238	6.619	29.888
3/20/02 5:38	18.994	9.236	6.62	29.891
3/20/02 5:39	18.994	9.236	6.619	29.888
3/20/02 5:40	18.987	9.236	6.619	29.891
3/20/02 5:41	18.987	9.236	6.619	29.891
3/20/02 5:42	18.981	9.235	6.618	29.891
3/20/02 5:43	18.987	9.236	6.618	29.888
3/20/02 5:44	18.987	9.236	6.619	29.888
3/20/02 5:45	18.987	9.235	6.618	29.891
3/20/02 5:46	18.981	9.236	6.618	29.888
3/20/02 5:47	18.981	9.236	6.618	29.891
3/20/02 5:48	18.981	9.236	6.618	29.888
3/20/02 5:49	18.981	9.234	6.618	29.891
3/20/02 5:50	18.981	9.236	6.617	29.893
3/20/02 5:51	18.981	9.236	6.617	29.891
3/20/02 5:52	18.981	9.235	6.617	29.893
3/20/02 5:53	18.975	9.235	6.617	29.893
3/20/02 5:54	18.975	9.235	6.617	29.893
3/20/02 5:55	18.969	9.235	6.615	29.895
3/20/02 5:56	18.975	9.233	6.615	29.895
3/20/02 5:57	18.969	9.233	6.615	29.895
3/20/02 5:58	18.969	9.234	6.614	29.897
3/20/02 5:59	18.963	9.231	6.614	29.895
3/20/02 6:00	18.963	9.231	6.615	29.897
3/20/02 6:01	18.969	9.245	6.614	29.897
3/20/02 6:02	18.963	9.233	6.614	29.897
3/20/02 6:03	18.963	9.231	6.614	29.897
3/20/02 6:04	18.969	9.234	6.614	29.895
3/20/02 6:05	18.963	9.231	6.614	29.895
3/20/02 6:06	18.963	9.231	6.613	29.899
3/20/02 6:07	18.963	9.234	6.614	29.897
3/20/02 6:08	18.963	9.231	6.612	29.897
3/20/02 6:09	18.956	9.233	6.613	29.897
3/20/02 6:10	18.95	9.233	6.613	29.897
3/20/02 6:11	18.956	9.231	6.613	29.897
3/20/02 6:12	18.956	9.233	6.613	29.897
3/20/02 6:13	18.95	9.231	6.613	29.897
3/20/02 6:14	18.95	9.233	6.613	29.899
3/20/02 6:15	18.95	9.233	6.613	29.899
3/20/02 6:16	18.944	9.23	6.612	29.899
3/20/02 6:17	18.95	9.233	6.612	29.901
3/20/02 6:18	18.95	9.233	6.613	29.901
3/20/02 6:19	18.95	9.234	6.613	29.899
3/20/02 6:20	18.944	9.231	6.613	29.899
3/20/02 6:21	18.944	9.233	6.613	29.899
3/20/02 6:22	18.944	9.231	6.614	29.899
3/20/02 6:23	18.944	9.231	6.613	29.899
3/20/02 6:24	18.938	9.231	6.612	29.901
3/20/02 6:25	18.938	9.231	6.613	29.899
3/20/02 6:26	18.938	9.233	6.614	29.899
3/20/02 6:27	18.938	9.233	6.614	29.903
3/20/02 6:28	18.938	9.23	6.613	29.903
3/20/02 6:29	18.938	9.233	6.613	29.899
3/20/02 6:30	18.938	9.234	6.613	29.901
3/20/02 6:31	18.938	9.231	6.613	29.903
3/20/02 6:32	18.925	9.231	6.613	29.901
3/20/02 6:33	18.931	9.233	6.614	29.901
3/20/02 6:34	18.931	9.233	6.613	29.903
3/20/02 6:35	18.931	9.23	6.613	29.903
3/20/02 6:36	18.931	9.234	6.613	29.901
3/20/02 6:37	18.931	9.231	6.614	29.903
3/20/02 6:38	18.925	9.231	6.614	29.903
3/20/02 6:39	18.925	9.233	6.614	29.903
3/20/02 6:40	18.925	9.233	6.614	29.905
3/20/02 6:41	18.925	9.234	6.614	29.905
3/20/02 6:42	18.931	9.233	6.614	29.905
3/20/02 6:43	18.925	9.233	6.614	29.905
3/20/02 6:44	18.925	9.231	6.613	29.905
3/20/02 6:45	18.919	9.231	6.613	29.905
3/20/02 6:46	18.919	9.233	6.614	29.907
3/20/02 6:47	18.913	9.234	6.614	29.907
3/20/02 6:48	18.913	9.233	6.614	29.907
3/20/02 6:49	18.919	9.23	6.614	29.907
3/20/02 6:50	18.913	9.23	6.614	29.909
3/20/02 6:51	18.919	9.23	6.612	29.909
3/20/02 6:52	18.919	9.23	6.613	29.909
3/20/02 6:53	18.913	9.23	6.614	29.907
3/20/02 6:54	18.913	9.231	6.614	29.909
3/20/02 6:55	18.913	9.234	6.614	29.909
3/20/02 6:56	18.913	9.233	6.614	29.907
3/20/02 6:57	18.913	9.233	6.614	29.909
3/20/02 6:58	18.919	9.233	6.615	29.909

City of Pompano Beach
Injection Test

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 6:59	18.913	9.234	6.615	29.909
3/20/02 7:00	18.913	9.235	6.615	29.911
3/20/02 7:01	18.913	9.233	6.615	29.911
3/20/02 7:02	18.913	9.234	6.615	29.911
3/20/02 7:05	18.906	9.24	6.617	29.913
3/20/02 7:06	18.906	9.235	6.618	29.913
3/20/02 7:07	18.9	9.235	6.617	29.911
3/20/02 7:08	18.919	9.235	6.617	29.913
3/20/02 7:09	18.9	9.235	6.618	29.913
3/20/02 7:10	18.906	9.236	6.618	29.913
3/20/02 7:11	18.906	9.236	6.619	29.913
3/20/02 7:12	18.9	9.236	6.619	29.913
3/20/02 7:13	18.9	9.236	6.618	29.913
3/20/02 7:14	18.906	9.235	6.618	29.913
3/20/02 7:15	18.9	9.235	6.619	29.913
3/20/02 7:16	18.906	9.238	6.619	29.913
3/20/02 7:17	18.9	9.238	6.62	29.913
3/20/02 7:18	18.894	9.238	6.62	29.917
3/20/02 7:19	18.9	9.24	6.62	29.915
3/20/02 7:20	18.9	9.24	6.622	29.915
3/20/02 7:21	18.894	9.238	6.622	29.915
3/20/02 7:22	18.888	9.241	6.622	29.917
3/20/02 7:23	18.9	9.242	6.623	29.917
3/20/02 7:24	18.9	9.241	6.623	29.915
3/20/02 7:25	18.9	9.241	6.623	29.919
3/20/02 7:26	18.894	9.241	6.624	29.917
3/20/02 7:27	18.9	9.241	6.624	29.917
3/20/02 7:28	18.906	9.242	6.625	29.919
3/20/02 7:29	18.894	9.241	6.625	29.919
3/20/02 7:30	18.9	9.244	6.625	29.919
3/20/02 7:31	18.888	9.247	6.625	29.917
3/20/02 7:32	18.894	9.242	6.628	29.917
3/20/02 7:33	18.888	9.244	6.628	29.919
3/20/02 7:34	18.888	9.249	6.628	29.919
3/20/02 7:35	18.888	9.242	6.629	29.919
3/20/02 7:36	18.875	9.224	6.627	29.919
3/20/02 7:37	18.894	9.246	6.628	29.917
3/20/02 7:38	18.888	9.246	6.629	29.921
3/20/02 7:39	18.888	9.245	6.629	29.921
3/20/02 7:40	18.888	9.246	6.629	29.919
3/20/02 7:41	18.888	9.247	6.629	29.919
3/20/02 7:42	18.888	9.246	6.63	29.919
3/20/02 7:43	18.888	9.247	6.629	29.923
3/20/02 7:44	18.888	9.247	6.63	29.921
3/20/02 7:45	18.894	9.246	6.632	29.923
3/20/02 7:46	18.888	9.25	6.632	29.921
3/20/02 7:47	18.881	9.246	6.633	29.923
3/20/02 7:48	18.888	9.246	6.633	29.923
3/20/02 7:49	18.888	9.25	6.633	29.923
3/20/02 7:50	18.881	9.247	6.634	29.925
3/20/02 7:51	18.881	9.25	6.634	29.925
3/20/02 7:52	18.888	9.249	6.634	29.925
3/20/02 7:53	18.881	9.249	6.635	29.925
3/20/02 7:54	18.881	9.25	6.635	29.927
3/20/02 7:55	18.875	9.25	6.635	29.927
3/20/02 7:56	18.875	9.25	6.637	29.929
3/20/02 7:57	18.875	9.251	6.637	29.929
3/20/02 7:58	18.881	9.256	6.637	29.927
3/20/02 7:59	18.875	9.262	6.635	29.927
3/20/02 8:00	18.875	9.252	6.635	29.929
3/20/02 8:01	18.875	9.25	6.638	29.929
3/20/02 8:02	18.875	9.252	6.638	29.929
3/20/02 8:03	18.875	9.252	6.638	29.927
3/20/02 8:04	18.875	9.252	6.639	29.931
3/20/02 8:05	18.875	9.252	6.639	29.931
3/20/02 8:06	18.888	9.213	6.635	29.927
3/20/02 8:07	18.875	9.254	6.639	29.931
3/20/02 8:08	18.875	9.252	6.64	29.929
3/20/02 8:09	18.894	9.252	6.64	29.941
3/20/02 8:10	18.888	9.252	6.64	29.923
3/20/02 8:11	18.888	9.252	6.642	29.915
3/20/02 8:12	18.881	9.252	6.642	29.909
3/20/02 8:13	18.863	9.254	6.64	29.897
3/20/02 8:14	18.869	9.256	6.643	29.911
3/20/02 8:15	18.869	9.255	6.643	29.919
3/20/02 8:16	18.863	9.256	6.643	29.923
3/20/02 8:17	18.863	9.259	6.644	29.929
3/20/02 8:18	18.863	9.256	6.644	29.929
3/20/02 8:19	18.856	9.256	6.644	29.931
3/20/02 8:20	18.856	9.255	6.644	29.931
3/20/02 8:21	18.856	9.255	6.644	29.933
3/20/02 8:22	18.856	9.256	6.645	29.933
3/20/02 8:23	18.863	9.255	6.645	29.933
3/20/02 8:24	19.125	9.257	6.647	29.935
3/20/02 8:25	18.881	9.256	6.648	29.935
3/20/02 8:26	18.831	9.257	6.648	29.937
3/20/02 8:27	18.844	9.255	6.647	29.935
3/20/02 8:28	18.825	9.254	6.648	29.937
3/20/02 8:29	18.863	9.256	6.648	29.937
3/20/02 8:30	18.844	9.257	6.649	29.935
3/20/02 8:31	18.856	9.255	6.648	29.935
3/20/02 8:32	18.856	9.256	6.649	29.937
3/20/02 8:33	18.85	9.256	6.65	29.939
3/20/02 8:34	18.863	9.256	6.65	29.939
3/20/02 8:35	18.856	9.256	6.65	29.941
3/20/02 8:36	18.85	9.257	6.65	29.939
3/20/02 8:37	18.856	9.257	6.65	29.939
3/20/02 8:38	18.856	9.26	6.652	29.941
3/20/02 8:39	18.856	9.262	6.654	29.941
3/20/02 8:40	18.85	9.257	6.652	29.941
3/20/02 8:41	18.85	9.259	6.653	29.941
3/20/02 8:42	18.856	9.26	6.654	29.941
3/20/02 8:43	18.838	9.26	6.654	29.939
3/20/02 8:44	18.813	9.26	6.654	29.941
3/20/02 8:45	18.781	9.259	6.654	29.941
3/20/02 8:46	18.757	9.262	6.655	29.943
3/20/02 8:47	18.757	9.26	6.655	29.941
3/20/02 8:48	18.725	9.257	6.655	29.943
3/20/02 8:49	18.707	9.265	6.655	29.945
3/20/02 8:50	18.844	9.261	6.657	29.943
3/20/02 8:51	18.838	9.26	6.657	29.948
3/20/02 8:52	18.825	9.257	6.657	29.945
3/20/02 8:53	18.825	9.262	6.657	29.948
3/20/02 8:54	18.838	9.26	6.659	29.943
3/20/02 8:55	18.838	9.261	6.659	29.945
3/20/02 8:56	18.844	9.26	6.657	29.945
3/20/02 8:57	18.838	9.26	6.659	29.945
3/20/02 8:58	18.844	9.267	6.662	29.948
3/20/02 8:59	18.838	9.261	6.659	29.945
3/20/02 9:00	18.838	9.26	6.66	29.95
3/20/02 9:01	18.838	9.266	6.66	29.945
3/20/02 9:02	18.838	9.265	6.662	29.95
3/20/02 9:03	18.838	9.271	6.66	29.95
3/20/02 9:04	18.831	9.262	6.663	29.952
3/20/02 9:05	18.838	9.269	6.663	29.952
3/20/02 9:06	18.831	9.265	6.663	29.952
3/20/02 9:07	18.844	9.261	6.662	29.966
3/20/02 9:08	18.85	9.262	6.662	29.948
3/20/02 9:09	18.838	9.261	6.662	29.937
3/20/02 9:10	18.85	9.269	6.663	29.931
3/20/02 9:11	18.819	9.265	6.663	29.929
3/20/02 9:12	18.825	9.266	6.664	29.939
3/20/02 9:13	18.825	9.266	6.664	29.941
3/20/02 9:14	18.825	9.265	6.665	29.948
3/20/02 9:15	18.825	9.272	6.667	29.948
3/20/02 9:16	18.813	9.269	6.665	29.952
3/20/02 9:17	18.825	9.274	6.667	29.954
3/20/02 9:18	18.819	9.271	6.667	29.956
3/20/02 9:19	18.819	9.271	6.668	29.958
3/20/02 9:20	18.813	9.27	6.667	29.958
3/20/02 9:21	18.819	9.271	6.667	29.958
3/20/02 9:22	18.813	9.272	6.667	29.96
3/20/02 9:23	18.813	9.274	6.667	29.958
3/20/02 9:24	18.813	9.275	6.668	29.958
3/20/02 9:25	18.813	9.272	6.668	29.956
3/20/02 9:26	18.813	9.271	6.667	29.96
3/20/02 9:27	18.819	9.274	6.669	29.958
3/20/02 9:28	18.813	9.274	6.67	29.958
3/20/02 9:29	18.806	9.269	6.668	29.96
3/20/02 9:30	18.813	9.271	6.669	29.958
3/20/02 9:31	18.806	9.272	6.67	29.958
3/20/02 9:32	18.813	9.272	6.67	29.958
3/20/02 9:33	18.806	9.274	6.672	29.958
3/20/02 9:34	18.806	9.272	6.673	29.96
3/20/02 9:35	18.813	9.277	6.673	29.96
3/20/02 9:36	18.8	9.274	6.674	29.96
3/20/02 9:37	18.8	9.272	6.672	29.96
3/20/02 9:38	18.806	9.279	6.674	29.96
3/20/02 9:39	18.8	9.274	6.674	29.96
3/20/02 9:40	18.806	9.276	6.674	29.96
3/20/02 9:41	18.806	9.28	6.675	29.96
3/20/02 9:42	18.794	9.274	6.673	29.96
3/20/02 9:43	18.8	9.276	6.675	29.962
3/20/02 9:44	18.8	9.277	6.675	29.962
3/20/02 9:45	18.8	9.274	6.674	29.96
3/20/02 9:46	18.8	9.276	6.677	29.962
3/20/02 9:47	18.794	9.276	6.677	29.96
3/20/02 9:48	18.794	9.275	6.677	29.964
3/20/02 9:49	18.794	9.277	6.679	29.964
3/20/02 9:50	18.794	9.276	6.678	29.964
3/20/02 9:51	18.788	9.272	6.678	29.962
3/20/02 9:52	18.806	9.276	6.678	29.964
3/20/02 9:53	18.788	9.275	6.679	29.966
3/20/02 9:54	18.8	9.277	6.68	29.964
3/20/02 9:55	18.788	9.277	6.679	29.964
3/20/02 9:56	18.8	9.277	6.68	29.966
3/20/02 9:57	18.788	9.277	6.68	29.964
3/20/02 9:58	18.794	9.277	6.68	29.964
3/20/02 9:59	18.794	9.279	6.682	29.966
3/20/02 10:00	18.781	9.277	6.682	29.966

City of Pompano Beach

Injection Test

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 10:01	18.794	9.286	6.683	29.968
3/20/02 10:02	18.788	9.28	6.682	29.966
3/20/02 10:03	18.794	9.277	6.682	29.968
3/20/02 10:04	18.788	9.28	6.683	29.964
3/20/02 10:05	18.788	9.282	6.683	29.968
3/20/02 10:06	18.788	9.28	6.683	29.968
3/20/02 10:07	18.788	9.28	6.684	29.968
3/20/02 10:08	18.788	9.28	6.684	29.964
3/20/02 10:09	18.788	9.281	6.685	29.97
3/20/02 10:10	18.788	9.284	6.685	29.97
3/20/02 10:11	18.781	9.281	6.684	29.966
3/20/02 10:12	18.788	9.284	6.685	29.968
3/20/02 10:13	18.788	9.289	6.688	29.966
3/20/02 10:14	18.781	9.28	6.685	29.968
3/20/02 10:15	18.781	9.28	6.687	29.966
3/20/02 10:16	18.781	9.282	6.687	29.966
3/20/02 10:17	18.781	9.284	6.688	29.968
3/20/02 10:18	18.781	9.286	6.688	29.968
3/20/02 10:19	18.781	9.287	6.689	29.968
3/20/02 10:20	18.781	9.284	6.689	29.968
3/20/02 10:21	18.775	9.284	6.688	29.97
3/20/02 10:22	18.775	9.286	6.69	29.97
3/20/02 10:23	18.775	9.286	6.688	29.968
3/20/02 10:24	18.775	9.291	6.689	29.97
3/20/02 10:25	18.769	9.286	6.689	29.97
3/20/02 10:26	18.781	9.294	6.692	29.97
3/20/02 10:27	18.775	9.292	6.692	29.968
3/20/02 10:28	18.763	9.289	6.69	29.968
3/20/02 10:29	18.775	9.292	6.693	29.972
3/20/02 10:30	18.769	9.292	6.693	29.97
3/20/02 10:31	18.775	9.295	6.692	29.97
3/20/02 10:32	18.769	9.294	6.693	29.968
3/20/02 10:33	18.769	9.295	6.694	29.97
3/20/02 10:34	18.769	9.296	6.694	29.972
3/20/02 10:35	18.769	9.292	6.693	29.97
3/20/02 10:36	18.769	9.296	6.695	29.97
3/20/02 10:37	18.769	9.295	6.694	29.968
3/20/02 10:38	18.763	9.292	6.695	29.968
3/20/02 10:39	18.763	9.296	6.695	29.968
3/20/02 10:40	18.763	9.297	6.698	29.97
3/20/02 10:41	18.763	9.3	6.698	29.97
3/20/02 10:42	18.763	9.299	6.697	29.966
3/20/02 10:43	18.763	9.302	6.698	29.97
3/20/02 10:44	18.763	9.297	6.698	29.968
3/20/02 10:45	18.763	9.297	6.698	29.968
3/20/02 10:46	18.763	9.301	6.699	29.968
3/20/02 10:47	18.757	9.296	6.7	29.966
3/20/02 10:48	18.757	9.3	6.699	29.966
3/20/02 10:49	18.763	9.3	6.7	29.966
3/20/02 10:50	18.763	9.3	6.702	29.964
3/20/02 10:51	18.757	9.301	6.702	29.966
3/20/02 10:52	18.757	9.302	6.703	29.964
3/20/02 10:53	18.757	9.296	6.702	29.966
3/20/02 10:54	18.757	9.299	6.702	29.964
3/20/02 10:55	18.763	9.3	6.704	29.964
3/20/02 10:56	18.75	9.299	6.703	29.964
3/20/02 10:57	18.763	9.3	6.704	29.966
3/20/02 10:58	18.763	9.302	6.704	29.964
3/20/02 10:59	18.75	9.297	6.704	29.962
3/20/02 11:00	18.75	9.295	6.704	29.964
3/20/02 11:01	18.744	9.304	6.705	29.966
3/20/02 11:02	18.75	9.304	6.705	29.966
3/20/02 11:03	18.757	9.296	6.705	29.964
3/20/02 11:04	18.744	9.3	6.707	29.966
3/20/02 11:05	18.744	9.3	6.707	29.966
3/20/02 11:06	18.744	9.297	6.707	29.966
3/20/02 11:07	18.744	9.3	6.707	29.966
3/20/02 11:08	18.744	9.299	6.707	29.964
3/20/02 11:09	18.744	9.3	6.707	29.966
3/20/02 11:10	18.744	9.299	6.708	29.968
3/20/02 11:11	18.744	9.3	6.707	29.966
3/20/02 11:12	18.738	9.299	6.707	29.968
3/20/02 11:13	18.738	9.299	6.707	29.966
3/20/02 11:14	18.744	9.299	6.707	29.97
3/20/02 11:15	18.738	9.299	6.708	29.968
3/20/02 11:16	18.738	9.301	6.707	29.968
3/20/02 11:17	18.732	9.3	6.708	29.97
3/20/02 11:18	18.732	9.3	6.707	29.968
3/20/02 11:19	18.732	9.299	6.708	29.97
3/20/02 11:20	18.738	9.304	6.708	29.968
3/20/02 11:21	18.732	9.302	6.709	29.968
3/20/02 11:22	18.732	9.301	6.709	29.968
3/20/02 11:23	18.725	9.299	6.709	29.968
3/20/02 11:24	18.732	9.301	6.709	29.966
3/20/02 11:25	18.725	9.301	6.709	29.968
3/20/02 11:26	18.725	9.304	6.71	29.968
3/20/02 11:27	18.725	9.302	6.709	29.968
3/20/02 11:28	18.725	9.304	6.71	29.968
3/20/02 11:29	18.725	9.302	6.71	29.968
3/20/02 11:30	18.719	9.302	6.712	29.968
3/20/02 11:31	18.719	9.304	6.712	29.966
3/20/02 11:32	18.719	9.3	6.712	29.966
3/20/02 11:33	18.719	9.302	6.712	29.968
3/20/02 11:34	18.719	9.304	6.712	29.968
3/20/02 11:35	18.719	9.304	6.712	29.966
3/20/02 11:36	18.719	9.305	6.713	29.968
3/20/02 11:37	18.719	9.305	6.713	29.966
3/20/02 11:38	18.713	9.307	6.712	29.966
3/20/02 11:39	18.713	9.307	6.712	29.964
3/20/02 11:40	18.713	9.306	6.714	29.966
3/20/02 11:41	18.713	9.307	6.714	29.966
3/20/02 11:42	18.713	9.307	6.714	29.966
3/20/02 11:43	18.707	9.307	6.714	29.964
3/20/02 11:44	18.707	9.306	6.714	29.966
3/20/02 11:45	18.707	9.311	6.715	29.966
3/20/02 11:46	18.713	9.314	6.714	29.968
3/20/02 11:47	18.707	9.312	6.714	29.968
3/20/02 11:48	18.707	9.312	6.714	29.968
3/20/02 11:49	18.707	9.312	6.714	29.968
3/20/02 11:50	18.707	9.31	6.714	29.968
3/20/02 11:51	18.7	9.311	6.714	29.966
3/20/02 11:52	18.7	9.311	6.714	29.966
3/20/02 11:53	18.694	9.306	6.714	29.964
3/20/02 11:54	18.7	9.305	6.714	29.964
3/20/02 11:55	18.7	9.312	6.715	29.964
3/20/02 11:56	18.7	9.316	6.717	29.964
3/20/02 11:57	18.7	9.315	6.717	29.966
3/20/02 11:58	18.694	9.314	6.715	29.966
3/20/02 11:59	18.694	9.311	6.718	29.964
3/20/02 12:00	18.694	9.312	6.718	29.966
3/20/02 12:01	18.694	9.312	6.718	29.964
3/20/02 12:02	18.694	9.314	6.718	29.964
3/20/02 12:03	18.694	9.314	6.718	29.964
3/20/02 12:04	18.688	9.312	6.718	29.962
3/20/02 12:05	18.688	9.312	6.718	29.962
3/20/02 12:06	18.682	9.31	6.718	29.96
3/20/02 12:07	18.688	9.307	6.718	29.96
3/20/02 12:08	18.688	9.314	6.719	29.958
3/20/02 12:09	18.688	9.31	6.718	29.958
3/20/02 12:10	18.682	9.314	6.72	29.956
3/20/02 12:11	18.688	9.311	6.718	29.958
3/20/02 12:12	18.682	9.311	6.719	29.956
3/20/02 12:13	18.682	9.314	6.719	29.956
3/20/02 12:14	18.682	9.311	6.72	29.956
3/20/02 12:15	18.675	9.307	6.718	29.956
3/20/02 12:16	18.675	9.307	6.719	29.958
3/20/02 12:17	18.675	9.31	6.72	29.958
3/20/02 12:18	18.669	9.31	6.719	29.958
3/20/02 12:19	18.675	9.311	6.72	29.958
3/20/02 12:20	18.669	9.311	6.719	29.954
3/20/02 12:21	18.669	9.31	6.719	29.956
3/20/02 12:22	18.669	9.312	6.72	29.954
3/20/02 12:23	18.663	9.31	6.72	29.956
3/20/02 12:24	18.669	9.314	6.722	29.956
3/20/02 12:25	18.663	9.31	6.719	29.954
3/20/02 12:26	18.663	9.31	6.719	29.954
3/20/02 12:27	18.663	9.311	6.72	29.954
3/20/02 12:28	18.663	9.311	6.719	29.954
3/20/02 12:29	18.663	9.31	6.72	29.952
3/20/02 12:30	18.663	9.314	6.72	29.954
3/20/02 12:31	18.657	9.309	6.719	29.952
3/20/02 12:32	18.663	9.31	6.72	29.952
3/20/02 12:33	18.663	9.314	6.719	29.954
3/20/02 12:34	18.657	9.31	6.72	29.952
3/20/02 12:35	18.657	9.314	6.72	29.954
3/20/02 12:36	18.65	9.314	6.72	29.956
3/20/02 12:37	18.65	9.314	6.72	29.956
3/20/02 12:38	18.65	9.31	6.719	29.954
3/20/02 12:39	18.65	9.314	6.72	29.952
3/20/02 12:40	18.644	9.311	6.719	29.952
3/20/02 12:41	18.65	9.311	6.72	29.952
3/20/02 12:42	18.65	9.312	6.719	29.948
3/20/02 12:43	18.644	9.312	6.72	29.948
3/20/02 12:44	18.644	9.317	6.72	29.95
3/20/02 12:45	18.644	9.314	6.719	29.95
3/20/02 12:46	18.644	9.31	6.719	29.95
3/20/02 12:47	18.644	9.314	6.72	29.95
3/20/02 12:48	18.638	9.311	6.719	29.948
3/20/02 12:49	18.638	9.311	6.718	29.948
3/20/02 12:50	18.632	9.312	6.719	29.95
3/20/02 12:51	18.638	9.315	6.722	29.95
3/20/02 12:52	18.632	9.314	6.72	29.95
3/20/02 12:53	18.632	9.311	6.719	29.948
3/20/02 12:54	18.638	9.314	6.719	29.948
3/20/02 12:55	18.632	9.312	6.718	29.95
3/20/02 12:56	18.632	9.311	6.718	29.948
3/20/02 12:57	18.632	9.312	6.717	29.948
3/20/02 12:58	18.632	9.311	6.718	29.948
3/20/02 12:59	18.632	9.314	6.718	29.948
3/20/02 13:00	18.625	9.311	6.717	29.945

City of Pompano Beach
Injection Test

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 13:01	18.625	9.311	6.717	29.948
3/20/02 13:02	18.625	9.311	6.717	29.945
3/20/02 13:03	18.619	9.314	6.717	29.945
3/20/02 13:04	18.619	9.311	6.717	29.945
3/20/02 13:05	18.625	9.314	6.717	29.945
3/20/02 13:06	18.619	9.309	6.715	29.948
3/20/02 13:07	18.613	9.309	6.717	29.948
3/20/02 13:08	18.613	9.311	6.717	29.948
3/20/02 13:09	18.613	9.309	6.715	29.95
3/20/02 13:10	18.613	9.31	6.715	29.945
3/20/02 13:11	18.613	9.309	6.715	29.945
3/20/02 13:12	18.613	9.31	6.715	29.948
3/20/02 13:13	18.607	9.307	6.714	29.945
3/20/02 13:14	18.607	9.31	6.714	29.948
3/20/02 13:15	18.6	9.307	6.714	29.945
3/20/02 13:16	18.607	9.307	6.715	29.945
3/20/02 13:17	18.6	9.309	6.714	29.945
3/20/02 13:18	18.6	9.307	6.714	29.945
3/20/02 13:19	18.594	9.31	6.714	29.945
3/20/02 13:20	18.6	9.305	6.713	29.943
3/20/02 13:21	18.594	9.305	6.712	29.945
3/20/02 13:22	18.594	9.309	6.713	29.945
3/20/02 13:23	18.594	9.307	6.713	29.943
3/20/02 13:24	18.588	9.306	6.712	29.943
3/20/02 13:25	18.594	9.306	6.712	29.943
3/20/02 13:26	18.588	9.307	6.712	29.943
3/20/02 13:27	18.588	9.309	6.712	29.943
3/20/02 13:28	18.582	9.301	6.712	29.943
3/20/02 13:29	18.582	9.307	6.712	29.943
3/20/02 13:30	18.582	9.305	6.712	29.943
3/20/02 13:31	18.582	9.304	6.71	29.943
3/20/02 13:32	18.582	9.305	6.71	29.941
3/20/02 13:33	18.575	9.305	6.709	29.943
3/20/02 13:34	18.575	9.304	6.709	29.943
3/20/02 13:35	18.575	9.302	6.709	29.939
3/20/02 13:36	18.575	9.304	6.708	29.941
3/20/02 13:37	18.575	9.304	6.709	29.941
3/20/02 13:38	18.569	9.305	6.709	29.941
3/20/02 13:39	18.569	9.302	6.708	29.939
3/20/02 13:40	18.563	9.299	6.707	29.941
3/20/02 13:41	18.569	9.301	6.707	29.937
3/20/02 13:42	18.563	9.304	6.708	29.941
3/20/02 13:43	18.563	9.3	6.707	29.939
3/20/02 13:44	18.563	9.301	6.705	29.939
3/20/02 13:45	18.557	9.301	6.705	29.939
3/20/02 13:46	18.557	9.299	6.705	29.939
3/20/02 13:47	18.557	9.302	6.705	29.937
3/20/02 13:48	18.557	9.299	6.705	29.939
3/20/02 13:49	18.557	9.301	6.705	29.937
3/20/02 13:50	18.557	9.301	6.707	29.937
3/20/02 13:51	18.551	9.3	6.704	29.937
3/20/02 13:52	18.551	9.297	6.704	29.937
3/20/02 13:53	18.551	9.296	6.703	29.935
3/20/02 13:54	18.544	9.302	6.704	29.935
3/20/02 13:55	18.551	9.299	6.703	29.937
3/20/02 13:56	18.544	9.299	6.703	29.935
3/20/02 13:57	18.544	9.3	6.703	29.935
3/20/02 13:58	18.544	9.301	6.703	29.935
3/20/02 13:59	18.538	9.299	6.702	29.933
3/20/02 14:00	18.538	9.296	6.702	29.935
3/20/02 14:01	18.544	9.299	6.702	29.933
3/20/02 14:02	18.538	9.299	6.7	29.935
3/20/02 14:03	18.532	9.295	6.7	29.933
3/20/02 14:04	18.532	9.295	6.7	29.933
3/20/02 14:05	18.532	9.297	6.7	29.935
3/20/02 14:06	18.532	9.296	6.699	29.933
3/20/02 14:07	18.526	9.294	6.698	29.931
3/20/02 14:08	18.532	9.296	6.698	29.933
3/20/02 14:09	18.532	9.295	6.697	29.933
3/20/02 14:10	18.532	9.295	6.697	29.931
3/20/02 14:11	18.526	9.295	6.698	29.933
3/20/02 14:12	18.526	9.295	6.697	29.931
3/20/02 14:13	18.519	9.295	6.695	29.931
3/20/02 14:14	18.519	9.294	6.697	29.931
3/20/02 14:15	18.519	9.294	6.695	29.931
3/20/02 14:16	18.519	9.294	6.695	29.931
3/20/02 14:17	18.513	9.292	6.695	29.929
3/20/02 14:18	18.513	9.291	6.694	29.929
3/20/02 14:19	18.513	9.29	6.694	29.929
3/20/02 14:20	18.513	9.294	6.695	29.931
3/20/02 14:21	18.513	9.29	6.693	29.931
3/20/02 14:22	18.507	9.289	6.693	29.929
3/20/02 14:23	18.513	9.291	6.693	29.929
3/20/02 14:24	18.507	9.29	6.69	29.927
3/20/02 14:25	18.507	9.291	6.693	29.929
3/20/02 14:26	18.507	9.287	6.689	29.929
3/20/02 14:27	18.501	9.29	6.689	29.927
3/20/02 14:28	18.501	9.29	6.689	29.925
3/20/02 14:29	18.501	9.287	6.689	29.927
3/20/02 14:30	18.494	9.286	6.688	29.925
3/20/02 14:31	18.494	9.286	6.688	29.927
3/20/02 14:32	18.501	9.287	6.688	29.925
3/20/02 14:33	18.494	9.267	6.687	29.927
3/20/02 14:34	18.494	9.295	6.687	29.929
3/20/02 14:35	18.488	9.262	6.685	29.929
3/20/02 14:36	18.488	9.285	6.685	29.927
3/20/02 14:37	18.488	9.286	6.685	29.927
3/20/02 14:38	18.488	9.281	6.684	29.925
3/20/02 14:39	18.482	9.281	6.684	29.927
3/20/02 14:40	18.482	9.281	6.684	29.927
3/20/02 14:41	18.482	9.285	6.684	29.925
3/20/02 14:42	18.482	9.285	6.683	29.925
3/20/02 14:43	18.482	9.281	6.683	29.925
3/20/02 14:44	18.476	9.279	6.683	29.923
3/20/02 14:45	18.476	9.28	6.682	29.927
3/20/02 14:46	18.476	9.28	6.68	29.923
3/20/02 14:47	18.476	9.281	6.682	29.921
3/20/02 14:48	18.469	9.279	6.68	29.919
3/20/02 14:49	18.469	9.279	6.679	29.923
3/20/02 14:50	18.469	9.276	6.679	29.921
3/20/02 14:51	18.469	9.277	6.678	29.921
3/20/02 14:52	18.469	9.28	6.678	29.923
3/20/02 14:53	18.463	9.275	6.679	29.923
3/20/02 14:54	18.463	9.274	6.675	29.923
3/20/02 14:55	18.463	9.275	6.678	29.921
3/20/02 14:56	18.463	9.275	6.677	29.921
3/20/02 14:57	18.457	9.274	6.675	29.923
3/20/02 14:58	18.457	9.272	6.675	29.923
3/20/02 14:59	18.457	9.272	6.675	29.923
3/20/02 15:00	18.457	9.274	6.674	29.921
3/20/02 15:01	18.451	9.271	6.673	29.923
3/20/02 15:02	18.451	9.271	6.673	29.925
3/20/02 15:03	18.444	9.271	6.673	29.923
3/20/02 15:04	18.451	9.274	6.673	29.921
3/20/02 15:05	18.451	9.274	6.673	29.921
3/20/02 15:06	18.444	9.27	6.67	29.921
3/20/02 15:07	18.444	9.272	6.67	29.921
3/20/02 15:08	18.444	9.269	6.67	29.921
3/20/02 15:09	18.444	9.272	6.67	29.921
3/20/02 15:10	18.438	9.272	6.669	29.921
3/20/02 15:11	18.438	9.27	6.669	29.921
3/20/02 15:12	18.444	9.27	6.669	29.919
3/20/02 15:13	18.438	9.266	6.667	29.921
3/20/02 15:14	18.438	9.272	6.669	29.917
3/20/02 15:15	18.432	9.265	6.667	29.921
3/20/02 15:16	18.432	9.269	6.667	29.917
3/20/02 15:17	18.432	9.27	6.665	29.917
3/20/02 15:18	18.432	9.267	6.664	29.917
3/20/02 15:19	18.432	9.266	6.665	29.917
3/20/02 15:20	18.426	9.266	6.664	29.917
3/20/02 15:21	18.426	9.266	6.664	29.917
3/20/02 15:22	18.419	9.262	6.663	29.919
3/20/02 15:23	18.419	9.264	6.662	29.915
3/20/02 15:24	18.426	9.262	6.663	29.917
3/20/02 15:25	18.426	9.264	6.662	29.917
3/20/02 15:26	18.419	9.264	6.66	29.917
3/20/02 15:27	18.419	9.262	6.659	29.917
3/20/02 15:28	18.419	9.264	6.659	29.915
3/20/02 15:29	18.413	9.261	6.659	29.915
3/20/02 15:30	18.419	9.261	6.66	29.917
3/20/02 15:31	18.413	9.262	6.659	29.917
3/20/02 15:32	18.401	9.262	6.658	29.917
3/20/02 15:33	18.413	9.259	6.654	29.915
3/20/02 15:34	18.401	9.277	6.658	29.913
3/20/02 15:35	18.401	9.24	6.658	29.915
3/20/02 15:36	18.401	9.26	6.657	29.915
3/20/02 15:37	18.394	9.259	6.655	29.915
3/20/02 15:38	18.394	9.254	6.654	29.913
3/20/02 15:39	18.394	9.256	6.654	29.913
3/20/02 15:40	18.388	9.255	6.652	29.913
3/20/02 15:41	18.394	9.254	6.65	29.913
3/20/02 15:42	18.394	9.254	6.65	29.911
3/20/02 15:43	18.388	9.255	6.65	29.917
3/20/02 15:44	18.388	9.252	6.65	29.915
3/20/02 15:45	18.388	9.252	6.649	29.915
3/20/02 15:46	18.382	9.251	6.648	29.913
3/20/02 15:47	18.382	9.251	6.649	29.913
3/20/02 15:48	18.382	9.25	6.648	29.911
3/20/02 15:49	18.382	9.251	6.647	29.913
3/20/02 15:50	18.382	9.252	6.647	29.911
3/20/02 15:51	18.376	9.25	6.645	29.911
3/20/02 15:52	18.376	9.249	6.644	29.909
3/20/02 15:53	18.376	9.251	6.644	29.911
3/20/02 15:54	18.369	9.249	6.644	29.911
3/20/02 15:55	18.369	9.249	6.644	29.909
3/20/02 15:56	18.369	9.249	6.643	29.911
3/20/02 15:57	18.369	9.247	6.643	29.909
3/20/02 15:58	18.369	9.244	6.642	29.909
3/20/02 15:59	18.369	9.245	6.642	29.909
3/20/02 16:00	18.369	9.249	6.642	29.909

City of Pompano Beach
Injection Test

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 16:01	18.369	9.244	6.64	29.909
3/20/02 16:02	18.369	9.244	6.64	29.907
3/20/02 16:03	18.363	9.242	6.64	29.909
3/20/02 16:04	18.363	9.245	6.64	29.907
3/20/02 16:05	18.363	9.242	6.639	29.909
3/20/02 16:06	18.363	9.244	6.638	29.907
3/20/02 16:07	18.363	9.242	6.638	29.905
3/20/02 16:08	18.357	9.24	6.638	29.909
3/20/02 16:09	18.357	9.242	6.637	29.907
3/20/02 16:10	18.357	9.242	6.635	29.909
3/20/02 16:11	18.357	9.241	6.635	29.909
3/20/02 16:12	18.363	9.242	6.635	29.907
3/20/02 16:13	18.357	9.244	6.635	29.909
3/20/02 16:14	18.357	9.242	6.634	29.907
3/20/02 16:15	18.357	9.24	6.634	29.905
3/20/02 16:16	18.357	9.241	6.634	29.907
3/20/02 16:17	18.357	9.24	6.634	29.907
3/20/02 16:18	18.351	9.239	6.633	29.905
3/20/02 16:19	18.357	9.239	6.632	29.907
3/20/02 16:20	18.351	9.24	6.633	29.905
3/20/02 16:21	18.351	9.241	6.632	29.905
3/20/02 16:22	18.351	9.236	6.63	29.905
3/20/02 16:23	18.351	9.238	6.63	29.905
3/20/02 16:24	18.351	9.236	6.63	29.903
3/20/02 16:25	18.351	9.235	6.629	29.903
3/20/02 16:26	18.345	9.238	6.629	29.903
3/20/02 16:27	18.345	9.24	6.628	29.903
3/20/02 16:28	18.345	9.235	6.629	29.903
3/20/02 16:29	18.345	9.238	6.628	29.901
3/20/02 16:30	18.345	9.238	6.629	29.901
3/20/02 16:31	18.338	9.236	6.627	29.901
3/20/02 16:32	18.338	9.233	6.627	29.901
3/20/02 16:33	18.338	9.235	6.625	29.901
3/20/02 16:34	18.338	9.235	6.625	29.901
3/20/02 16:35	18.338	9.236	6.625	29.899
3/20/02 16:36	18.338	9.233	6.625	29.899
3/20/02 16:37	18.338	9.233	6.625	29.901
3/20/02 16:38	18.338	9.234	6.625	29.899
3/20/02 16:39	18.338	9.233	6.623	29.899
3/20/02 16:40	18.338	9.233	6.623	29.899
3/20/02 16:41	18.332	9.231	6.622	29.899
3/20/02 16:42	18.338	9.233	6.622	29.899
3/20/02 16:43	18.332	9.231	6.622	29.901
3/20/02 16:44	18.338	9.231	6.62	29.901
3/20/02 16:45	18.332	9.231	6.62	29.897
3/20/02 16:46	18.338	9.231	6.62	29.901
3/20/02 16:47	18.326	9.23	6.62	29.899
3/20/02 16:48	18.332	9.228	6.619	29.897
3/20/02 16:49	18.326	9.231	6.619	29.897
3/20/02 16:50	18.326	9.225	6.618	29.897
3/20/02 16:51	18.326	9.229	6.618	29.895
3/20/02 16:52	18.32	9.229	6.618	29.895
3/20/02 16:53	18.32	9.225	6.617	29.895
3/20/02 16:54	18.326	9.229	6.617	29.895
3/20/02 16:55	18.326	9.226	6.615	29.895
3/20/02 16:56	18.326	9.224	6.617	29.895
3/20/02 16:57	18.326	9.226	6.615	29.895
3/20/02 16:58	18.326	9.226	6.615	29.893
3/20/02 16:59	18.326	9.224	6.614	29.893
3/20/02 17:00	18.326	9.226	6.614	29.893
3/20/02 17:01	18.326	9.224	6.614	29.893
3/20/02 17:02	18.32	9.225	6.614	29.893
3/20/02 17:03	18.32	9.229	6.612	29.895
3/20/02 17:04	18.32	9.226	6.614	29.893
3/20/02 17:05	18.326	9.228	6.612	29.891
3/20/02 17:06	18.32	9.225	6.613	29.891
3/20/02 17:07	18.32	9.229	6.612	29.891
3/20/02 17:08	18.32	9.224	6.612	29.891
3/20/02 17:09	18.307	9.225	6.61	29.891
3/20/02 17:10	18.307	9.221	6.61	29.891
3/20/02 17:11	18.307	9.224	6.61	29.893
3/20/02 17:12	18.307	9.223	6.61	29.891
3/20/02 17:13	18.313	9.223	6.609	29.893
3/20/02 17:14	18.301	9.221	6.609	29.893
3/20/02 17:15	18.307	9.22	6.609	29.891
3/20/02 17:16	18.307	9.221	6.609	29.893
3/20/02 17:17	18.307	9.22	6.608	29.891
3/20/02 17:18	18.313	9.223	6.608	29.895
3/20/02 17:19	18.313	9.221	6.608	29.891
3/20/02 17:20	18.307	9.22	6.608	29.891
3/20/02 17:21	18.301	9.22	6.607	29.893
3/20/02 17:22	18.301	9.218	6.608	29.893
3/20/02 17:23	18.301	9.218	6.607	29.895
3/20/02 17:24	18.301	9.218	6.607	29.893
3/20/02 17:25	18.301	9.218	6.605	29.891
3/20/02 17:26	18.301	9.216	6.605	29.893
3/20/02 17:27	18.301	9.218	6.604	29.893
3/20/02 17:28	18.295	9.218	6.604	29.893
3/20/02 17:29	18.301	9.218	6.604	29.893
3/20/02 17:30	18.295	9.215	6.604	29.895
3/20/02 17:31	18.295	9.216	6.604	29.895
3/20/02 17:32	18.295	9.215	6.603	29.893
3/20/02 17:33	18.301	9.218	6.604	29.893
3/20/02 17:34	18.295	9.218	6.604	29.893
3/20/02 17:35	18.295	9.216	6.603	29.891
3/20/02 17:36	18.295	9.218	6.603	29.891
3/20/02 17:37	18.295	9.219	6.603	29.888
3/20/02 17:38	18.295	9.218	6.603	29.891
3/20/02 17:39	18.295	9.216	6.603	29.893
3/20/02 17:40	18.295	9.218	6.603	29.888
3/20/02 17:41	18.288	9.216	6.602	29.893
3/20/02 17:42	18.295	9.215	6.599	29.888
3/20/02 17:43	18.288	9.216	6.602	29.891
3/20/02 17:44	18.288	9.216	6.599	29.893
3/20/02 17:45	18.288	9.216	6.599	29.891
3/20/02 17:46	18.288	9.215	6.6	29.888
3/20/02 17:47	18.288	9.215	6.599	29.891
3/20/02 17:48	18.295	9.216	6.599	29.891
3/20/02 17:49	18.288	9.213	6.599	29.891
3/20/02 17:50	18.288	9.215	6.599	29.891
3/20/02 17:51	18.288	9.213	6.598	29.888
3/20/02 17:52	18.295	9.215	6.598	29.891
3/20/02 17:53	18.288	9.216	6.599	29.888
3/20/02 17:54	18.288	9.216	6.598	29.891
3/20/02 17:55	18.288	9.211	6.598	29.891
3/20/02 17:56	18.295	9.186	6.599	29.891
3/20/02 17:57	18.282	9.215	6.598	29.888
3/20/02 17:58	18.288	9.214	6.597	29.888
3/20/02 17:59	18.288	9.213	6.598	29.891
3/20/02 18:00	18.288	9.215	6.598	29.888
3/20/02 18:01	18.282	9.216	6.598	29.888
3/20/02 18:02	18.282	9.215	6.598	29.888
3/20/02 18:03	18.282	9.214	6.598	29.891
3/20/02 18:04	18.288	9.216	6.598	29.888
3/20/02 18:05	18.282	9.216	6.597	29.886
3/20/02 18:06	18.282	9.214	6.597	29.888
3/20/02 18:07	18.282	9.214	6.597	29.886
3/20/02 18:08	18.282	9.215	6.597	29.888
3/20/02 18:09	18.282	9.216	6.597	29.888
3/20/02 18:10	18.27	9.215	6.597	29.888
3/20/02 18:11	18.282	9.215	6.597	29.891
3/20/02 18:12	18.276	9.213	6.597	29.891
3/20/02 18:13	18.276	9.214	6.597	29.888
3/20/02 18:14	18.276	9.215	6.597	29.888
3/20/02 18:15	18.276	9.213	6.597	29.888
3/20/02 18:16	18.276	9.214	6.597	29.888
3/20/02 18:17	18.276	9.215	6.597	29.888
3/20/02 18:18	18.27	9.216	6.597	29.891
3/20/02 18:19	18.276	9.215	6.597	29.886
3/20/02 18:20	18.276	9.214	6.597	29.888
3/20/02 18:21	18.276	9.21	6.597	29.886
3/20/02 18:22	18.27	9.209	6.597	29.888
3/20/02 18:23	18.27	9.21	6.597	29.891
3/20/02 18:24	18.27	9.214	6.597	29.891
3/20/02 18:25	18.27	9.214	6.597	29.888
3/20/02 18:26	18.27	9.214	6.597	29.888
3/20/02 18:27	18.27	9.213	6.595	29.888
3/20/02 18:28	18.27	9.215	6.597	29.888
3/20/02 18:29	18.27	9.215	6.597	29.888
3/20/02 18:30	18.27	9.213	6.597	29.888
3/20/02 18:31	18.27	9.214	6.597	29.891
3/20/02 18:32	18.27	9.214	6.597	29.888
3/20/02 18:33	18.27	9.214	6.597	29.888
3/20/02 18:34	18.27	9.214	6.597	29.891
3/20/02 18:35	18.263	9.215	6.597	29.891
3/20/02 18:36	18.27	9.216	6.595	29.888
3/20/02 18:37	18.27	9.21	6.597	29.891
3/20/02 18:38	18.263	9.214	6.597	29.888
3/20/02 18:39	18.263	9.215	6.597	29.888
3/20/02 18:40	18.263	9.215	6.597	29.888
3/20/02 18:41	18.263	9.214	6.597	29.888
3/20/02 18:42	18.27	9.215	6.597	29.888
3/20/02 18:43	18.263	9.215	6.597	29.888
3/20/02 18:44	18.263	9.215	6.597	29.888
3/20/02 18:45	18.263	9.214	6.597	29.888
3/20/02 18:46	18.263	9.216	6.597	29.888
3/20/02 18:47	18.263	9.214	6.597	29.888
3/20/02 18:48	18.263	9.214	6.597	29.886
3/20/02 18:49	18.263	9.215	6.597	29.888
3/20/02 18:50	18.263	9.213	6.598	29.888
3/20/02 18:51	18.263	9.214	6.598	29.888
3/20/02 18:52	18.263	9.214	6.597	29.888
3/20/02 18:53	18.263	9.214	6.598	29.888
3/20/02 18:54	18.263	9.215	6.598	29.888
3/20/02 18:55	18.263	9.215	6.598	29.891
3/20/02 18:56	18.263	9.215	6.595	29.891
3/20/02 18:57	18.263	9.215	6.598	29.888
3/20/02 18:58	18.263	9.215	6.597	29.888
3/20/02 18:59	18.257	9.215	6.595	29.891
3/20/02 19:00	18.257	9.215	6.597	29.888

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 19:01	18.263	9.215	6.597	29.888
3/20/02 19:02	18.257	9.216	6.597	29.888
3/20/02 19:03	18.263	9.216	6.597	29.891
3/20/02 19:04	18.257	9.214	6.597	29.888
3/20/02 19:05	18.257	9.214	6.598	29.893
3/20/02 19:06	18.257	9.235	6.597	29.891
3/20/02 19:07	18.245	9.205	6.602	29.891
3/20/02 19:08	18.27	9.216	6.599	29.891
3/20/02 19:09	18.27	9.231	6.599	29.891
3/20/02 19:10	18.251	9.213	6.599	29.893
3/20/02 19:11	18.251	9.216	6.599	29.891
3/20/02 19:12	18.251	9.215	6.599	29.893
3/20/02 19:13	18.257	9.219	6.599	29.893
3/20/02 19:14	18.251	9.218	6.599	29.893
3/20/02 19:15	18.251	9.218	6.599	29.893
3/20/02 19:16	18.251	9.216	6.598	29.893
3/20/02 19:17	18.257	9.22	6.599	29.893
3/20/02 19:18	18.257	9.219	6.599	29.893
3/20/02 19:19	18.251	9.218	6.599	29.895
3/20/02 19:20	18.257	9.218	6.599	29.893
3/20/02 19:21	18.251	9.218	6.6	29.893
3/20/02 19:22	18.251	9.219	6.6	29.893
3/20/02 19:23	18.251	9.211	6.602	29.895
3/20/02 19:24	18.257	9.233	6.602	29.895
3/20/02 19:25	18.245	9.221	6.599	29.895
3/20/02 19:26	18.245	9.216	6.602	29.895
3/20/02 19:27	18.251	9.221	6.6	29.895
3/20/02 19:28	18.251	9.216	6.602	29.895
3/20/02 19:29	18.245	9.219	6.6	29.893
3/20/02 19:30	18.245	9.22	6.602	29.893
3/20/02 19:31	18.245	9.218	6.6	29.895
3/20/02 19:32	18.245	9.218	6.6	29.893
3/20/02 19:33	18.245	9.218	6.602	29.895
3/20/02 19:34	18.245	9.221	6.602	29.895
3/20/02 19:35	18.245	9.216	6.603	29.895
3/20/02 19:36	18.245	9.218	6.603	29.895
3/20/02 19:37	18.245	9.223	6.603	29.895
3/20/02 19:38	18.245	9.218	6.603	29.895
3/20/02 19:39	18.245	9.219	6.603	29.895
3/20/02 19:40	18.251	9.224	6.604	29.893
3/20/02 19:41	18.251	9.224	6.604	29.895
3/20/02 19:42	18.251	9.223	6.604	29.893
3/20/02 19:43	18.251	9.225	6.605	29.893
3/20/02 19:44	18.251	9.224	6.605	29.895
3/20/02 19:45	18.245	9.226	6.607	29.895
3/20/02 19:46	18.245	9.225	6.607	29.895
3/20/02 19:47	18.251	9.224	6.607	29.895
3/20/02 19:48	18.251	9.229	6.607	29.893
3/20/02 19:49	18.245	9.224	6.608	29.895
3/20/02 19:50	18.251	9.225	6.608	29.895
3/20/02 19:51	18.245	9.228	6.608	29.895
3/20/02 19:52	18.251	9.221	6.609	29.897
3/20/02 19:53	18.251	9.226	6.609	29.897
3/20/02 19:54	18.245	9.225	6.609	29.899
3/20/02 19:55	18.245	9.224	6.61	29.897
3/20/02 19:56	18.245	9.228	6.61	29.895
3/20/02 19:57	18.245	9.229	6.61	29.897
3/20/02 19:58	18.251	9.229	6.61	29.897
3/20/02 19:59	18.245	9.228	6.612	29.897
3/20/02 20:00	18.245	9.229	6.612	29.897
3/20/02 20:01	18.245	9.231	6.612	29.899
3/20/02 20:02	18.245	9.231	6.613	29.899
3/20/02 20:03	18.245	9.23	6.613	29.897
3/20/02 20:04	18.238	9.231	6.613	29.897
3/20/02 20:05	18.245	9.231	6.615	29.897
3/20/02 20:06	18.245	9.231	6.615	29.897
3/20/02 20:07	18.245	9.23	6.614	29.897
3/20/02 20:08	18.245	9.231	6.617	29.899
3/20/02 20:09	18.245	9.234	6.617	29.897
3/20/02 20:10	18.245	9.234	6.617	29.899
3/20/02 20:11	18.245	9.231	6.617	29.899
3/20/02 20:12	18.245	9.231	6.618	29.899
3/20/02 20:13	18.245	9.235	6.618	29.899
3/20/02 20:14	18.245	9.234	6.618	29.901
3/20/02 20:15	18.251	9.233	6.619	29.899
3/20/02 20:16	18.245	9.238	6.619	29.901
3/20/02 20:17	18.245	9.235	6.619	29.899
3/20/02 20:18	18.245	9.235	6.62	29.899
3/20/02 20:19	18.245	9.234	6.62	29.901
3/20/02 20:20	18.245	9.235	6.62	29.901
3/20/02 20:21	18.245	9.238	6.622	29.901
3/20/02 20:22	18.245	9.236	6.623	29.901
3/20/02 20:23	18.245	9.238	6.623	29.901
3/20/02 20:24	18.245	9.235	6.623	29.903
3/20/02 20:25	18.245	9.239	6.623	29.901
3/20/02 20:26	18.245	9.234	6.624	29.903
3/20/02 20:27	18.245	9.239	6.625	29.903
3/20/02 20:28	18.245	9.241	6.625	29.905
3/20/02 20:29	18.251	9.238	6.625	29.903
3/20/02 20:30	18.245	9.24	6.625	29.905
3/20/02 20:31	18.245	9.24	6.627	29.903
3/20/02 20:32	18.245	9.24	6.627	29.905
3/20/02 20:33	18.245	9.241	6.628	29.905
3/20/02 20:34	18.245	9.241	6.628	29.907
3/20/02 20:35	18.245	9.241	6.628	29.905
3/20/02 20:36	18.245	9.242	6.629	29.905
3/20/02 20:37	18.245	9.242	6.629	29.905
3/20/02 20:38	18.245	9.241	6.629	29.905
3/20/02 20:39	18.245	9.242	6.63	29.907
3/20/02 20:40	18.245	9.244	6.63	29.907
3/20/02 20:41	18.245	9.245	6.632	29.907
3/20/02 20:42	18.245	9.244	6.632	29.907
3/20/02 20:43	18.245	9.246	6.632	29.907
3/20/02 20:44	18.245	9.242	6.633	29.907
3/20/02 20:45	18.251	9.247	6.633	29.909
3/20/02 20:46	18.245	9.247	6.634	29.909
3/20/02 20:47	18.245	9.249	6.634	29.907
3/20/02 20:48	18.245	9.246	6.634	29.909
3/20/02 20:49	18.245	9.25	6.635	29.909
3/20/02 20:50	18.245	9.249	6.635	29.909
3/20/02 20:51	18.245	9.25	6.635	29.909
3/20/02 20:52	18.245	9.249	6.637	29.911
3/20/02 20:53	18.245	9.247	6.637	29.911
3/20/02 20:54	18.251	9.251	6.638	29.909
3/20/02 20:55	18.245	9.249	6.639	29.909
3/20/02 20:56	18.245	9.251	6.639	29.911
3/20/02 20:57	18.245	9.252	6.639	29.907
3/20/02 20:58	18.245	9.25	6.64	29.911
3/20/02 20:59	18.245	9.251	6.64	29.911
3/20/02 21:00	18.245	9.252	6.64	29.913
3/20/02 21:01	18.245	9.251	6.642	29.913
3/20/02 21:02	18.245	9.255	6.642	29.913
3/20/02 21:03	18.245	9.254	6.643	29.913
3/20/02 21:04	18.245	9.252	6.643	29.913
3/20/02 21:05	18.245	9.254	6.643	29.915
3/20/02 21:06	18.245	9.254	6.644	29.915
3/20/02 21:07	18.245	9.256	6.644	29.913
3/20/02 21:08	18.245	9.254	6.645	29.913
3/20/02 21:09	18.245	9.255	6.645	29.915
3/20/02 21:10	18.251	9.256	6.647	29.913
3/20/02 21:11	18.245	9.256	6.647	29.913
3/20/02 21:12	18.245	9.256	6.648	29.913
3/20/02 21:13	18.245	9.257	6.648	29.915
3/20/02 21:14	18.245	9.257	6.648	29.915
3/20/02 21:15	18.245	9.257	6.649	29.917
3/20/02 21:16	18.245	9.26	6.649	29.915
3/20/02 21:17	18.245	9.259	6.65	29.915
3/20/02 21:18	18.245	9.26	6.652	29.915
3/20/02 21:19	18.251	9.264	6.653	29.917
3/20/02 21:20	18.245	9.264	6.653	29.917
3/20/02 21:21	18.245	9.264	6.654	29.917
3/20/02 21:22	18.245	9.261	6.654	29.915
3/20/02 21:23	18.195	9.26	6.653	29.915
3/20/02 21:24	18.213	9.26	6.653	29.905
3/20/02 21:25	18.251	9.264	6.654	29.901
3/20/02 21:26	18.257	9.261	6.655	29.895
3/20/02 21:27	18.238	9.265	6.657	29.878
3/20/02 21:28	18.251	9.262	6.658	29.897
3/20/02 21:29	18.245	9.267	6.659	29.905
3/20/02 21:30	18.245	9.27	6.659	29.909
3/20/02 21:31	18.238	9.266	6.66	29.911
3/20/02 21:32	18.238	9.27	6.66	29.913
3/20/02 21:33	18.245	9.267	6.662	29.915
3/20/02 21:34	18.251	9.272	6.662	29.915
3/20/02 21:35	18.245	9.271	6.663	29.915
3/20/02 21:36	18.245	9.269	6.664	29.915
3/20/02 21:37	18.245	9.269	6.664	29.915
3/20/02 21:38	18.251	9.274	6.664	29.915
3/20/02 21:39	18.245	9.276	6.665	29.917
3/20/02 21:40	18.251	9.275	6.667	29.917
3/20/02 21:41	18.245	9.272	6.667	29.917
3/20/02 21:42	18.251	9.275	6.668	29.917
3/20/02 21:43	18.245	9.276	6.668	29.917
3/20/02 21:44	18.245	9.275	6.669	29.917
3/20/02 21:45	18.251	9.275	6.67	29.917
3/20/02 21:46	18.251	9.276	6.669	29.917
3/20/02 21:47	18.238	9.301	6.673	29.919
3/20/02 21:48	18.245	9.276	6.672	29.919
3/20/02 21:49	18.251	9.274	6.672	29.919
3/20/02 21:50	18.245	9.28	6.673	29.919
3/20/02 21:51	18.245	9.277	6.673	29.919
3/20/02 21:52	18.251	9.279	6.674	29.919
3/20/02 21:53	18.245	9.277	6.674	29.919
3/20/02 21:54	18.251	9.28	6.674	29.919
3/20/02 21:55	18.251	9.277	6.675	29.919
3/20/02 21:56	18.257	9.279	6.677	29.919
3/20/02 21:57	18.245	9.281	6.677	29.919
3/20/02 21:58	18.257	9.282	6.678	29.919
3/20/02 21:59	18.251	9.282	6.678	29.919
3/20/02 22:00	18.245	9.282	6.679	29.919

City of Pompano Beach
Injection Test

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 22:01	18.245	9.284	6.679	29.919
3/20/02 22:02	18.245	9.285	6.679	29.919
3/20/02 22:03	18.201	9.282	6.68	29.923
3/20/02 22:04	18.257	9.286	6.68	29.917
3/20/02 22:04	18.251	9.286	6.68	29.919
3/20/02 22:04	18.251	9.284	6.68	29.917
3/20/02 22:04	18.238	9.284	6.68	29.917
3/20/02 22:04	18.238	9.285	6.68	29.917
3/20/02 22:04	18.238	9.285	6.68	29.917
3/20/02 22:04	18.238	9.287	6.68	29.917
3/20/02 22:04	18.232	9.285	6.68	29.915
3/20/02 22:04	18.245	9.284	6.68	29.915
3/20/02 22:04	18.238	9.282	6.68	29.917
3/20/02 22:04	18.238	9.284	6.68	29.915
3/20/02 22:04	18.238	9.284	6.68	29.915
3/20/02 22:04	18.245	9.282	6.68	29.915
3/20/02 22:04	18.232	9.285	6.68	29.915
3/20/02 22:04	18.238	9.284	6.68	29.915
3/20/02 22:04	18.238	9.284	6.679	29.913
3/20/02 22:04	18.232	9.284	6.68	29.913
3/20/02 22:04	18.238	9.284	6.68	29.911
3/20/02 22:04	18.238	9.285	6.68	29.913
3/20/02 22:04	18.238	9.284	6.68	29.913
3/20/02 22:04	18.238	9.286	6.68	29.913

Date Time	IW 1 PSI	MW UPPER PSI	MW LOWER PSI	BAROMETRIC Inches Hg
3/20/02 22:22	38.715	9.295	6.697	29.915
3/20/02 22:23	38.459	9.302	6.698	29.917
3/20/02 22:24	38.39	9.302	6.698	29.917
3/20/02 22:25	38.846	9.297	6.699	29.917
3/20/02 22:26	38.984	9.306	6.7	29.917
3/20/02 22:27	38.984	9.307	6.7	29.919
3/20/02 22:28	38.465	9.305	6.702	29.919
3/20/02 22:29	38.815	9.309	6.703	29.917
3/20/02 22:30	38.921	9.309	6.703	29.917
3/20/02 22:31	38.928	9.304	6.704	29.919
3/20/02 22:32	39.459	9.305	6.705	29.919
3/20/02 22:33	38.728	9.309	6.707	29.919
3/20/02 22:34	38.796	9.307	6.707	29.919
3/20/02 22:35	39.053	9.314	6.708	29.917
3/20/02 22:36	38.753	9.309	6.708	29.917
3/20/02 22:37	38.778	9.31	6.709	29.917
3/20/02 22:38	38.571	9.311	6.71	29.917
3/20/02 22:39	39.128	9.306	6.712	29.917
3/20/02 22:40	39.04	9.319	6.712	29.917
3/20/02 22:41	38.44	9.314	6.713	29.915
3/20/02 22:42	39.515	9.315	6.713	29.917
3/20/02 22:43	38.34	9.314	6.715	29.915
3/20/02 22:44	38.59	9.316	6.715	29.915
3/20/02 22:45	38.715	9.32		

City of Pompano Beach

Injection Test

	DOWNHOLE	DOWNHOLE
Date Time	(psi)	Temp (F)
3/20/02 8:00	16.31	78.4
3/20/02 8:01	16.31	78.66
3/20/02 8:02	16.32	78.92
3/20/02 8:04	16.26	79.43
3/20/02 8:05	16.25	79.67
3/20/02 8:06	16.23	79.91
3/20/02 8:07	16.24	80.16
3/20/02 8:08	16.27	80.4
3/20/02 8:10	16.24	80.82
3/20/02 8:11	16.24	81
3/20/02 8:12	16.23	81.18
3/20/02 8:13	16.22	81.36
3/20/02 8:14	16.22	81.54
3/20/02 8:16	16.28	81.9
3/20/02 8:17	16.29	82.08
3/20/02 8:18	16.27	82.26
3/20/02 8:19	16.27	82.44
3/20/02 8:20	16.13	82.61
3/20/02 8:22	15.79	82.44
3/20/02 8:23	15.58	82.08
3/20/02 8:24	18.41	81.72
3/20/02 8:25	24.24	81.36
3/20/02 8:26	31.36	81.01
3/20/02 8:28	88.03	80.29
3/20/02 8:29	126.98	79.92
3/20/02 8:30	137.75	79.56
3/20/02 8:31	137.78	79.2
3/20/02 8:32	137.7	78.84
3/20/02 8:34	137.58	78.44
3/20/02 8:35	137.57	78.4
3/20/02 8:36	137.56	78.36
3/20/02 8:37	137.55	78.32
3/20/02 8:38	137.55	78.28
3/20/02 8:40	137.53	78.18
3/20/02 8:41	137.52	78.13
3/20/02 8:42	137.51	78.07
3/20/02 8:43	141.67	78.02
3/20/02 8:44	213.21	77.96
3/20/02 8:46	466.59	77.34
3/20/02 8:47	593.05	76.77
3/20/02 8:48	719.77	76.21
3/20/02 8:49	845.47	75.64
3/20/02 8:50	966.16	75.07
3/20/02 8:52	1013.64	74.41
3/20/02 8:53	1013.65	74.32
3/20/02 8:54	1013.64	74.23
3/20/02 8:55	1013.62	74.14
3/20/02 8:56	1013.63	74.05
3/20/02 8:58	1013.57	73.96
3/20/02 8:59	1013.56	73.97
3/20/02 9:00	1013.56	73.97
3/20/02 9:01	1013.56	73.97
3/20/02 9:02	1013.57	73.97
3/20/02 9:04	1013.56	73.95
3/20/02 9:05	1013.56	73.93
3/20/02 9:06	1013.56	73.91
3/20/02 9:07	1013.54	73.88
3/20/02 9:08	1013.55	73.86
3/20/02 9:10	1013.57	73.85
3/20/02 9:11	1013.58	73.86
3/20/02 9:12	1013.6	73.87
3/20/02 9:13	1013.6	73.88
3/20/02 9:14	1013.6	73.89
3/20/02 9:16	1013.6	73.9
3/20/02 9:17	1013.58	73.9
3/20/02 9:18	1013.58	73.9
3/20/02 9:19	1013.58	73.91
3/20/02 9:20	1013.58	73.91
3/20/02 9:22	1013.59	73.91
3/20/02 9:23	1013.59	73.9
3/20/02 9:24	1013.6	73.9
3/20/02 9:25	1013.59	73.9
3/20/02 9:26	1013.6	73.9
3/20/02 9:28	1013.6	73.9
3/20/02 9:29	1013.61	73.91
3/20/02 9:30	1013.6	73.92
3/20/02 9:31	1013.6	73.92
3/20/02 9:32	1013.59	73.93
3/20/02 9:34	1013.58	73.93
3/20/02 9:35	1013.59	73.93
3/20/02 9:36	1013.61	73.92
3/20/02 9:37	1013.59	73.92
3/20/02 9:38	1013.58	73.91
3/20/02 9:40	1013.59	73.91
3/20/02 9:41	1013.6	73.9
3/20/02 9:42	1013.6	73.9
3/20/02 9:43	1013.61	73.9
3/20/02 9:44	1013.61	73.9
3/20/02 9:46	1013.6	73.9
3/20/02 9:47	1013.6	73.89
3/20/02 9:48	1013.6	73.88
3/20/02 9:49	1013.59	73.88
3/20/02 9:50	1013.61	73.87
3/20/02 9:52	1013.6	73.86
3/20/02 9:53	1013.58	73.87
3/20/02 9:54	1013.59	73.87
3/20/02 9:55	1013.6	73.87
3/20/02 9:56	1013.6	73.87
3/20/02 9:58	1013.6	73.87
3/20/02 9:59	1013.6	73.87
3/20/02 10:00	1013.6	73.86
3/20/02 10:01	1013.59	73.86
3/20/02 10:02	1013.6	73.85
3/20/02 10:04	1013.6	73.85
3/20/02 10:05	1013.59	73.85
3/20/02 10:06	1013.59	73.85
3/20/02 10:07	1013.59	73.85
3/20/02 10:08	1013.61	73.85
3/20/02 10:10	1013.61	73.85
3/20/02 10:11	1013.61	73.85
3/20/02 10:12	1013.62	73.85
3/20/02 10:13	1013.61	73.85
3/20/02 10:14	1013.6	73.86
3/20/02 10:16	1013.61	73.86
3/20/02 10:17	1013.61	73.86
3/20/02 10:18	1013.61	73.86
3/20/02 10:19	1013.61	73.86
3/20/02 10:20	1013.6	73.86
3/20/02 10:22	1013.58	73.85
3/20/02 10:23	1013.59	73.84
3/20/02 10:24	1013.6	73.83
3/20/02 10:25	1013.6	73.81
3/20/02 10:26	1013.6	73.8
3/20/02 10:28	1013.61	73.8
3/20/02 10:29	1013.62	73.82
3/20/02 10:30	1013.63	73.83
3/20/02 10:31	1013.62	73.84
3/20/02 10:32	1013.62	73.86
3/20/02 10:34	1013.6	73.86
3/20/02 10:35	1013.59	73.86
3/20/02 10:36	1013.59	73.85
3/20/02 10:37	1013.58	73.84
3/20/02 10:38	1013.58	73.84
3/20/02 10:40	1013.59	73.83
3/20/02 10:41	1013.61	73.82
3/20/02 10:42	1013.62	73.82
3/20/02 10:43	1013.6	73.82
3/20/02 10:44	1013.6	73.81
3/20/02 10:46	1013.61	73.82
3/20/02 10:47	1013.61	73.82
3/20/02 10:48	1013.61	73.82
3/20/02 10:49	1013.59	73.83
3/20/02 10:50	1013.6	73.83
3/20/02 10:52	1013.6	73.83
3/20/02 10:53	1013.59	73.83
3/20/02 10:54	1013.59	73.83
3/20/02 10:55	1013.59	73.83
3/20/02 10:56	1013.59	73.84
3/20/02 10:58	1013.6	73.84
3/20/02 10:59	1013.6	73.84
3/20/02 11:00	1013.6	73.84
3/20/02 11:01	1013.63	73.85
3/20/02 11:02	1013.63	73.85
3/20/02 11:04	1013.59	73.84
3/20/02 11:05	1013.58	73.82
3/20/02 11:06	1013.57	73.8
3/20/02 11:07	1013.57	73.79
3/20/02 11:08	1013.55	73.77
3/20/02 11:10	1013.59	73.76
3/20/02 11:11	1013.58	73.76
3/20/02 11:12	1013.58	73.76
3/20/02 11:13	1013.57	73.76
3/20/02 11:14	1013.57	73.76
3/20/02 11:16	1013.58	73.77
3/20/02 11:17	1013.59	73.77
3/20/02 11:18	1013.6	73.78
3/20/02 11:19	1013.62	73.78
3/20/02 11:20	1013.62	73.79
3/20/02 11:22	1013.59	73.79
3/20/02 11:23	1013.59	73.79
3/20/02 11:24	1013.6	73.79
3/20/02 11:25	1013.58	73.79
3/20/02 11:26	1013.57	73.79
3/20/02 11:28	1013.59	73.79
3/20/02 11:29	1013.59	73.78
3/20/02 11:30	1013.58	73.77
3/20/02 11:31	1013.59	73.77
3/20/02 11:32	1013.58	73.76
3/20/02 11:34	1013.59	73.76
3/20/02 11:35	1013.6	73.77
3/20/02 11:36	1013.59	73.77
3/20/02 11:37	1013.58	73.77
3/20/02 11:38	1013.57	73.78
3/20/02 11:40	1013.58	73.78
3/20/02 11:41	1013.58	73.77
3/20/02 11:42	1013.56	73.77
3/20/02 11:43	1013.56	73.77
3/20/02 11:44	1013.57	73.76
3/20/02 11:46	1013.56	73.75
3/20/02 11:47	1013.56	73.75
3/20/02 11:48	1013.57	73.75
3/20/02 11:49	1013.57	73.75
3/20/02 11:50	1013.55	73.74
3/20/02 11:52	1013.55	73.74
3/20/02 11:53	1013.56	73.74
3/20/02 11:54	1013.56	73.74
3/20/02 11:55	1013.55	73.75
3/20/02 11:56	1013.55	73.75
3/20/02 11:58	1013.58	73.75
3/20/02 11:59	1013.58	73.76
3/20/02 12:00	1013.58	73.77
3/20/02 12:01	1013.57	73.77
3/20/02 12:02	1013.56	73.78
3/20/02 12:04	1013.56	73.79
3/20/02 12:05	1013.57	73.79
3/20/02 12:06	1013.57	73.79
3/20/02 12:07	1013.57	73.8
3/20/02 12:08	1013.57	73.8
3/20/02 12:10	1013.56	73.8
3/20/02 12:11	1013.54	73.79
3/20/02 12:12	1013.55	73.79
3/20/02 12:13	1013.56	73.78
3/20/02 12:14	1013.56	73.77
3/20/02 12:16	1013.54	73.76
3/20/02 12:17	1013.54	73.75
3/20/02 12:18	1013.55	73.74
3/20/02 12:19	1013.52	73.73
3/20/02 12:20	1013.52	73.72
3/20/02 12:22	1013.56	73.72
3/20/02 12:23	1013.57	73.73
3/20/02 12:24	1013.55	73.74
3/20/02 12:25	1013.54	73.75
3/20/02 12:26	1013.54	73.77
3/20/02 12:28	1013.54	73.77
3/20/02 12:29	1013.54	73.77
3/20/02 12:30	1013.55	73.77
3/20/02 12:31	1013.55	73.76
3/20/02 12:32	1013.54	73.76
3/20/02 12:34	1013.53	73.75
3/20/02 12:35	1013.53	73.74
3/20/02 12:36	1013.52	73.73
3/20/02 12:37	1013.52	73.72
3/20/02 12:38	1013.54	73.72
3/20/02 12:40	1013.54	73.72
3/20/02 12:41	1013.53	73.72
3/20/02 12:42	1013.54	73.73
3/20/02 12:43	1013.56	73.74
3/20/02 12:44	1013.54	73.74
3/20/02 12:46	1013.52	73.74
3/20/02 12:47	1013.52	73.73
3/20/02 12:48	1013.52	73.71
3/20/02 12:49	1013.5	73.7
3/20/02 12:50	1013.49	73.69
3/20/02 12:52	1013.52	73.68
3/20/02 12:53	1013.53	73.69
3/20/02 12:54	1013.5	73.7
3/20/02 12:55	1013.5	73.71
3/20/02 12:56	1013.5	73.71
3/20/02 12:58	1013.51	73.71
3/20/02 12:59	1013.51	73.7
3/20/02 13:00	1013.51	73.69
3/20/02 13:01	1013.49	73.68
3/20/02 13:02	1013.49	73.67
3/20/02 13:04	1013.5	73.66
3/20/02 13:05	1013.49	73.65
3/20/02 13:06	1013.5	73.65
3/20/02 13:07	1013.48	73.64
3/20/02 13:08	1013.48	73.63
3/20/02 13:10	1013.48	73.63
3/20/02 13:11	1013.47	73.62
3/20/02 13:12	1013.48	73.62
3/20/02 13:13	1013.48	73.62
3/20/02 13:14	1013.49	73.61
3/20/02 13:16	1013.49	73.61
3/20/02 13:17	1013.48	73.62
3/20/02 13:18	1013.48	73.62
3/20/02 13:19	1013.49	73.62
3/20/02 13:20	1013.49	73.62
3/20/02 13:22	1013.49	73.63
3/20/02 13:23	1013.49	73.63
3/20/02 13:24	1013.49	73.64
3/20/02 13:25	1013.49	73.64
3/20/02 13:26	1013.48	73.65
3/20/02 13:28	1013.47	73.64
3/20/02 13:29	1013.47	73.63
3/20/02 13:30	1013.48	73.62
3/20/02 13:31	1013.48	73.61
3/20/02 13:32	1013.47	73.6
3/20/02 13:34	1013.47	73.59
3/20/02 13:35	1013.48	73.59
3/20/02 13:36	1013.47	73.6
3/20/02 13:37	1013.45	73.6
3/20/02 13:38	1013.44	73.6
3/20/02 13:40	1013.45	73.6
3/20/02 13:41	1013.46	73.6
3/20/02 13:42	1013.47	73.59
3/20/02 13:43	1013.45	73.59
3/20/02 13:44	1013.45	73.59
3/20/02 13:46	1013.45	73.59
3/20/02 13:47	1013.44	73.59
3/20/02 13:48	1013.45	73.59
3/20/02 13:49	1013.45	73.59
3/20/02 13:50	1013.45	73.6
3/20/02 13:52	1013.44	73.6
3/20/02 13:53	1013.43	73.6
3/20/02 13:54	1013.44	73.6
3/20/02 13:55	1013.43	73.6
3/20/02 13:56	1013.42	73.6
3/20/02 13:58	1013.43	73.6
3/20/02 13:59	1013.44	73.6
3/20/02 14:00	1013.43	73.59
3/20/02 14:01	1013.42	73.59
3/20/02 14:02	1013.43	73.59
3/20/02 14:04	1013.43	73.59
3/20/02 14:05	1013.43	73.59
3/20/02 14:06	1013.42	73.59
3/20/02 14:07	1013.43	73.59
3/20/02 14:08	1013.41	73.59
3/20/02 14:10	1013.41	73.58
3/20/02 14:11	1013.42	73.58
3/20/02 14:12	1013.42	73.57
3/20/02 14:13	1013.42	73.57
3/20/02 14:14	1013.4	73.57
3/20/02 14:16	1013.4	73.56
3/20/02 14:17	1013.42	73.56
3/20/02 14:18	1013.41	73.55
3/20/02 14:19	1013.43	73.55
3/20/02 14:20	1013.42	73.55
3/20/02 14:22	1013.39	73.54
3/20/02 14:23	1013.41	73.54
3/20/02 14:24	1013.4	73.54
3/20/02 14:25	1013.4	73.54
3/20/02 14:26	1013.39	73.54
3/20/02 14:28	1013.4	73.54
3/20/02 14:29	1013.41	73.54
3/20/02 14:30	1013.4	73.54
3/20/02 14:31	1013.39	73.54
3/20/02 14:32	1013.39	73.54
3/20/02 14:34	1013.39	73.55
3/20/02 14:35	1013.39	73.55
3/20/02 14:36	1013.39	73.55
3/20/02 14:37	1013.38	73.55
3/20/02 14:38	1013.39	73.55
3/20/02 14:40	1013.37	73.55
3/20/02 14:41	1013.37	73.55
3/20/02 14:42	1013.35	73.54
3/20/02 14:43	1013.36	73.54
3/20/02 14:44	1013.35	73.53
3/20/02 14:46	1013.36	73.52
3/20/02 14:47	1013.36	73.51
3/20/02 14:48	1013.36	73.51
3/20/02 14:49	1013.35	73.5
3/20/02 14:50	1013.35	73.5
3/20/02 14:52	1013.36	73.5
3/20/02 14:53	1013.36	73.51
3/20/02 14:54	1013.37	73.52
3/20/02 14:55	1013.37	73.53
3/20/02 14:56	1013.37	73.54
3/20/02 14:58	1013.34	73.54
3/20/02 14:59	1013.34	73.54
3/20/02 15:00	1013.34	73.53
3/20/02 15:01	1013.35	73.53
3/20/02 15:02	1013.35	73.52
3/20/02 15:04	1013.35	73.51
3/20/02 15:05	1013.34	73.51
3/20/02 15:06	1013.35	73.51
3/20/02 15:07	1013.35	73.51
3/20/02 15:08	1013.35	73.51
3/20/02 15:10	1013.34	73.51
3/20/02 15:11	1013.34	73.51

City of Pompano Beach

Injection Test

Date Time	DOWNHOLE (psi)	DOWNHOLE Temp (F)
3/20/02 15:12	1013.34	73.51
3/20/02 15:13	1013.33	73.51
3/20/02 15:14	1013.33	73.51
3/20/02 15:16	1013.32	73.49
3/20/02 15:17	1013.3	73.49
3/20/02 15:18	1013.31	73.48
3/20/02 15:19	1013.31	73.47
3/20/02 15:20	1013.31	73.46
3/20/02 15:22	1013.32	73.45
3/20/02 15:23	1013.32	73.45
3/20/02 15:24	1013.31	73.45
3/20/02 15:25	1013.31	73.45
3/20/02 15:26	1013.3	73.44
3/20/02 15:28	1013.3	73.44
3/20/02 15:29	1013.32	73.44
3/20/02 15:30	1013.32	73.43
3/20/02 15:31	1013.31	73.43
3/20/02 15:32	1013.29	73.43
3/20/02 15:34	1013.3	73.41
3/20/02 15:35	1013.3	73.4
3/20/02 15:36	1013.29	73.4
3/20/02 15:37	1013.26	73.39
3/20/02 15:38	1013.27	73.38
3/20/02 15:40	1013.3	73.38
3/20/02 15:41	1013.31	73.39
3/20/02 15:42	1013.3	73.4
3/20/02 15:43	1013.29	73.4
3/20/02 15:44	1013.29	73.41
3/20/02 15:46	1013.27	73.42
3/20/02 15:47	1013.27	73.42
3/20/02 15:48	1013.27	73.42
3/20/02 15:49	1013.26	73.42
3/20/02 15:50	1013.28	73.42
3/20/02 15:52	1013.27	73.42
3/20/02 15:53	1013.27	73.42
3/20/02 15:54	1013.26	73.42
3/20/02 15:55	1013.26	73.42
3/20/02 15:56	1013.26	73.41
3/20/02 15:58	1013.26	73.41
3/20/02 15:59	1013.26	73.4
3/20/02 16:00	1013.26	73.39
3/20/02 16:01	1013.26	73.39
3/20/02 16:02	1013.28	73.38
3/20/02 16:04	1013.26	73.38
3/20/02 16:05	1013.26	73.39
3/20/02 16:06	1013.25	73.39
3/20/02 16:07	1013.25	73.4
3/20/02 16:08	1013.25	73.4
3/20/02 16:10	1013.25	73.4
3/20/02 16:11	1013.25	73.39
3/20/02 16:12	1013.25	73.38
3/20/02 16:13	1013.25	73.37
3/20/02 16:14	1013.25	73.36
3/20/02 16:16	1013.25	73.34
3/20/02 16:17	1013.24	73.33
3/20/02 16:18	1013.25	73.32
3/20/02 16:19	1013.25	73.32
3/20/02 16:20	1013.24	73.31
3/20/02 16:22	1013.25	73.3
3/20/02 16:23	1013.25	73.3
3/20/02 16:24	1013.25	73.3
3/20/02 16:25	1013.25	73.31
3/20/02 16:26	1013.24	73.31
3/20/02 16:28	1013.24	73.31
3/20/02 16:29	1013.25	73.31
3/20/02 16:30	1013.25	73.31
3/20/02 16:31	1013.24	73.31
3/20/02 16:32	1013.24	73.31
3/20/02 16:34	1013.24	73.31
3/20/02 16:35	1013.24	73.31
3/20/02 16:36	1013.25	73.31
3/20/02 16:37	1013.25	73.31
3/20/02 16:38	1013.24	73.3
3/20/02 16:40	1013.23	73.3
3/20/02 16:41	1013.24	73.29
3/20/02 16:42	1013.24	73.29
3/20/02 16:43	1013.24	73.28
3/20/02 16:44	1013.24	73.28
3/20/02 16:46	1013.24	73.27
3/20/02 16:47	1013.23	73.27
3/20/02 16:48	1013.23	73.27
3/20/02 16:49	1013.22	73.27
3/20/02 16:50	1013.23	73.26
3/20/02 16:52	1013.23	73.26
3/20/02 16:53	1013.23	73.27
3/20/02 16:54	1013.22	73.27
3/20/02 16:55	1013.22	73.27
3/20/02 16:56	1013.22	73.27
3/20/02 16:58	1013.22	73.27
3/20/02 16:59	1013.21	73.27
3/20/02 17:00	1013.22	73.26
3/20/02 17:01	1013.22	73.26
3/20/02 17:02	1013.22	73.26
3/20/02 17:04	1013.2	73.25
3/20/02 17:05	1013.21	73.25
3/20/02 17:06	1013.21	73.25
3/20/02 17:07	1013.22	73.25
3/20/02 17:08	1013.21	73.25
3/20/02 17:10	1013.21	73.25
3/20/02 17:11	1013.21	73.24
3/20/02 17:12	1013.21	73.23
3/20/02 17:13	1013.2	73.23
3/20/02 17:14	1013.2	73.22
3/20/02 17:16	1013.21	73.22
3/20/02 17:17	1013.2	73.22
3/20/02 17:18	1013.21	73.22
3/20/02 17:19	1013.21	73.22
3/20/02 17:20	1013.22	73.22
3/20/02 17:22	1013.21	73.21
3/20/02 17:23	1013.21	73.2
3/20/02 17:24	1013.19	73.19
3/20/02 17:25	1013.19	73.18
3/20/02 17:26	1013.19	73.18
3/20/02 17:28	1013.2	73.16
3/20/02 17:29	1013.21	73.16
3/20/02 17:30	1013.2	73.16
3/20/02 17:31	1013.21	73.16
3/20/02 17:32	1013.21	73.16
3/20/02 17:34	1013.21	73.16
3/20/02 17:35	1013.21	73.17
3/20/02 17:36	1013.21	73.17
3/20/02 17:37	1013.19	73.17
3/20/02 17:38	1013.18	73.18
3/20/02 17:40	1013.21	73.19
3/20/02 17:41	1013.2	73.19
3/20/02 17:42	1013.2	73.19
3/20/02 17:43	1013.2	73.19
3/20/02 17:44	1013.2	73.19
3/20/02 17:46	1013.2	73.19
3/20/02 17:47	1013.2	73.19
3/20/02 17:48	1013.2	73.19
3/20/02 17:49	1013.2	73.19
3/20/02 17:50	1013.2	73.19
3/20/02 17:52	1013.2	73.18
3/20/02 17:53	1013.2	73.18
3/20/02 17:54	1013.2	73.18
3/20/02 17:55	1013.19	73.17
3/20/02 17:56	1013.19	73.17
3/20/02 17:58	1013.18	73.16
3/20/02 17:59	1013.18	73.14
3/20/02 18:00	1013.19	73.13
3/20/02 18:01	1013.19	73.12
3/20/02 18:02	1013.19	73.11
3/20/02 18:04	1013.19	73.1
3/20/02 18:05	1013.19	73.1
3/20/02 18:06	1013.19	73.1
3/20/02 18:07	1013.18	73.09
3/20/02 18:08	1013.19	73.09
3/20/02 18:10	1013.2	73.09
3/20/02 18:11	1013.19	73.09
3/20/02 18:12	1013.19	73.09
3/20/02 18:13	1013.18	73.09
3/20/02 18:14	1013.18	73.09
3/20/02 18:16	1013.18	73.09
3/20/02 18:17	1013.19	73.09
3/20/02 18:18	1013.19	73.09
3/20/02 18:19	1013.19	73.08
3/20/02 18:20	1013.19	73.08
3/20/02 18:22	1013.18	73.08
3/20/02 18:23	1013.19	73.08
3/20/02 18:24	1013.19	73.08
3/20/02 18:25	1013.2	73.08
3/20/02 18:26	1013.19	73.08
3/20/02 18:28	1013.17	73.08
3/20/02 18:29	1013.17	73.07
3/20/02 18:30	1013.17	73.07
3/20/02 18:31	1013.18	73.07
3/20/02 18:32	1013.19	73.06
3/20/02 18:34	1013.19	73.06
3/20/02 18:35	1013.19	73.07
3/20/02 18:36	1013.18	73.07
3/20/02 18:37	1013.18	73.07
3/20/02 18:38	1013.19	73.08
3/20/02 18:40	1013.18	73.08
3/20/02 18:41	1013.19	73.08
3/20/02 18:42	1013.19	73.07
3/20/02 18:43	1013.19	73.07
3/20/02 18:44	1013.18	73.07
3/20/02 18:46	1013.18	73.06
3/20/02 18:47	1013.18	73.05
3/20/02 18:48	1013.17	73.05
3/20/02 18:49	1013.16	73.04
3/20/02 18:50	1013.16	73.03
3/20/02 18:52	1013.17	73.02
3/20/02 18:53	1013.18	73.01
3/20/02 18:54	1013.16	73.01
3/20/02 18:55	1013.17	73
3/20/02 18:56	1013.18	73
3/20/02 18:58	1013.17	72.99
3/20/02 18:59	1013.17	72.99
3/20/02 19:00	1013.17	72.98
3/20/02 19:01	1013.17	72.98
3/20/02 19:02	1013.17	72.98
3/20/02 19:04	1013.18	72.98
3/20/02 19:05	1013.18	72.98
3/20/02 19:06	1013.19	72.99
3/20/02 19:07	1013.19	72.99
3/20/02 19:08	1013.19	73
3/20/02 19:10	1013.18	73
3/20/02 19:11	1013.17	72.99
3/20/02 19:12	1013.18	72.98
3/20/02 19:13	1013.19	72.98
3/20/02 19:14	1013.18	72.97
3/20/02 19:16	1013.17	72.96
3/20/02 19:17	1013.17	72.96
3/20/02 19:18	1013.17	72.96
3/20/02 19:19	1013.17	72.95
3/20/02 19:20	1013.16	72.95
3/20/02 19:22	1013.18	72.94
3/20/02 19:23	1013.17	72.94
3/20/02 19:24	1013.17	72.94
3/20/02 19:25	1013.17	72.94
3/20/02 19:26	1013.17	72.93
3/20/02 19:28	1013.18	72.93
3/20/02 19:29	1013.17	72.93
3/20/02 19:30	1013.18	72.92
3/20/02 19:31	1013.17	72.92
3/20/02 19:32	1013.17	72.92
3/20/02 19:34	1013.18	72.91
3/20/02 19:35	1013.18	72.91
3/20/02 19:36	1013.18	72.9
3/20/02 19:37	1013.17	72.9
3/20/02 19:38	1013.18	72.89
3/20/02 19:40	1013.18	72.89
3/20/02 19:41	1013.18	72.89
3/20/02 19:42	1013.17	72.9
3/20/02 19:43	1013.18	72.9
3/20/02 19:44	1013.18	72.91
3/20/02 19:46	1013.18	72.9
3/20/02 19:47	1013.18	72.9
3/20/02 19:48	1013.18	72.89
3/20/02 19:49	1013.16	72.89
3/20/02 19:50	1013.17	72.88
3/20/02 19:52	1013.18	72.88
3/20/02 19:53	1013.18	72.87
3/20/02 19:54	1013.18	72.87
3/20/02 19:55	1013.19	72.87
3/20/02 19:56	1013.18	72.86
3/20/02 19:58	1013.18	72.86
3/20/02 19:59	1013.18	72.86
3/20/02 20:00	1013.18	72.86
3/20/02 20:01	1013.16	72.86
3/20/02 20:02	1013.17	72.86
3/20/02 20:04	1013.18	72.86
3/20/02 20:05	1013.18	72.86
3/20/02 20:06	1013.18	72.86
3/20/02 20:07	1013.19	72.85
3/20/02 20:08	1013.19	72.85
3/20/02 20:10	1013.19	72.85
3/20/02 20:11	1013.19	72.85
3/20/02 20:12	1013.19	72.85
3/20/02 20:13	1013.19	72.86
3/20/02 20:14	1013.19	72.86
3/20/02 20:16	1013.19	72.86
3/20/02 20:17	1013.19	72.85
3/20/02 20:18	1013.18	72.85
3/20/02 20:19	1013.18	72.85
3/20/02 20:20	1013.18	72.85
3/20/02 20:22	1013.17	72.84
3/20/02 20:23	1013.17	72.83
3/20/02 20:24	1013.18	72.82
3/20/02 20:25	1013.18	72.81
3/20/02 20:26	1013.19	72.8
3/20/02 20:28	1013.18	72.79
3/20/02 20:29	1013.18	72.79
3/20/02 20:30	1013.19	72.79
3/20/02 20:31	1013.19	72.79
3/20/02 20:32	1013.19	72.79
3/20/02 20:34	1013.18	72.78
3/20/02 20:35	1013.19	72.78
3/20/02 20:36	1013.19	72.78
3/20/02 20:37	1013.18	72.78
3/20/02 20:38	1013.18	72.78
3/20/02 20:40	1013.19	72.78
3/20/02 20:41	1013.19	72.78
3/20/02 20:42	1013.19	72.78
3/20/02 20:43	1013.2	72.78
3/20/02 20:44	1013.2	72.78
3/20/02 20:46	1013.19	72.78
3/20/02 20:47	1013.2	72.78
3/20/02 20:48	1013.19	72.78
3/20/02 20:49	1013.18	72.78
3/20/02 20:50	1013.19	72.78
3/20/02 20:52	1013.2	72.77
3/20/02 20:53	1013.18	72.76
3/20/02 20:54	1013.18	72.75
3/20/02 20:55	1013.18	72.74
3/20/02 20:56	1013.18	72.72
3/20/02 20:58	1013.19	72.72
3/20/02 20:59	1013.2	72.72
3/20/02 21:00	1013.2	72.72
3/20/02 21:01	1013.2	72.72
3/20/02 21:02	1013.2	72.73
3/20/02 21:04	1013.2	72.73
3/20/02 21:05	1013.2	72.72
3/20/02 21:06	1013.19	72.72
3/20/02 21:07	1013.19	72.71
3/20/02 21:08	1013.19	72.71
3/20/02 21:10	1013.2	72.71
3/20/02 21:11	1013.2	72.71
3/20/02 21:12	1013.2	72.71
3/20/02 21:13	1013.2	72.71
3/20/02 21:14	1013.2	72.7
3/20/02 21:16	1013.2	72.7
3/20/02 21:17	1013.2	72.7
3/20/02 21:18	1013.2	72.7
3/20/02 21:19	1013.21	72.7
3/20/02 21:20	1013.21	72.7
3/20/02 21:22	1013.2	72.69
3/20/02 21:23	1013.2	72.69
3/20/02 21:24	1013.19	72.68
3/20/02 21:25	1013.19	72.67
3/20/02 21:26	1013.2	72.66
3/20/02 21:28	1013.2	72.65
3/20/02 21:29	1013.2	72.65
3/20/02 21:30	1013.2	72.65
3/20/02 21:31	1013.2	72.64
3/20/02 21:32	1013.21	72.64
3/20/02 21:34	1013.2	72.63
3/20/02 21:35	1013.2	72.63
3/20/02 21:36	1013.21	72.63
3/20/02 21:37	1013.21	72.63
3/20/02 21:38	1013.21	72.63
3/20/02 21:40	1013.21	72.63
3/20/02 21:41	1013.21	72.63
3/20/02 21:42	1013.21	72.64
3/20/02 21:43	1013.21	72.65
3/20/02 21:44	1013.21	72.65
3/20/02 21:46	1013.2	72.65
3/20/02 21:47	1013.2	72.63
3/20/02 21:48	1013.2	72.62
3/20/02 21:49	1013.2	72.61
3/20/02 21:50	1013.21	72.59
3/20/02 21:52	1013.21	72.58
3/20/02 21:53	1013.22	72.59
3/20/02 21:54	1013.22	72.59
3/20/02 21:55	1013.2	72.59
3/20/02 21:56	1013.21	72.59
3/20/02 21:58	1013.21	72.59
3/20/02 21:59	1013.21	72.59
3/20/02 22:00	1013.21	72.59
3/20/02 22:01	1013.22	72.58
3/20/02 22:02	1013.22	72.58
3/20/02 22:04	1013.28	72.8
3/20/02 22:05	1013.34	73.02
3/20/02 22:06	1013.43	73.25
3/20/02 22:07	1013.77	73.47
3/20/02 22:08	1015.28	73.69
3/20/02 22:10	1015.14	74.68
3/20/02 22:11	1014.85	75.45
3/20/02 22:12	1013.22	76.21
3/20/02 22:13	1013.67	76.98
3/20/02 22:14	1014.09	77.75
3/20/02 22:16	1014.42	78.56
3/20/02 22:17	1014.44	78.59
3/20/02 22:18	1014.46	78.63
3/20/02 22:19	1014.47	78.67
3/20/02 22:20	1014.49	78.71
3/20/02 22:22	1014.51	78.76
3/20/02 22:23	1014.51	78.77

City of Pompano
Beach
Injection Test

Date Time	DOWNHOLE (psi)	DOWNHOLE Temp (F)
3/20/02 22:24	1014.52	78.78
3/20/02 22:25	1014.52	78.79
3/20/02 22:26	1014.53	78.8
3/20/02 22:28	1014.53	78.81
3/20/02 22:29	1014.54	78.81
3/20/02 22:30	1014.54	78.82
3/20/02 22:31	1014.54	78.82
3/20/02 22:32	1014.54	78.82
3/20/02 22:34	1014.54	78.83
3/20/02 22:35	1014.55	78.83
3/20/02 22:36	1014.55	78.83
3/20/02 22:37	1014.55	78.83
3/20/02 22:38	1014.55	78.83
3/20/02 22:40	1014.55	78.84
3/20/02 22:41	1014.55	78.84
3/20/02 22:42	1014.55	78.84
3/20/02 22:43	1014.56	78.84
3/20/02 22:44	1014.56	78.84
3/20/02 22:46	1014.56	78.84
3/20/02 22:47	1014.56	78.84
3/20/02 22:48	1014.56	78.84
3/20/02 22:49	1014.56	78.84
3/20/02 22:50	1014.56	78.84
3/20/02 22:52	1014.56	78.84
3/20/02 22:53	1014.56	78.84
3/20/02 22:54	1014.56	78.84
3/20/02 22:55	1014.56	78.84
3/20/02 22:56	1014.56	78.84
3/20/02 22:58	1014.57	78.85
3/20/02 22:59	1014.57	78.85
3/20/02 23:00	1014.57	78.85
3/20/02 23:01	1014.57	78.85
3/20/02 23:02	1014.57	78.85
3/20/02 23:04	1014.57	78.85
3/20/02 23:05	1014.57	78.85
3/20/02 23:06	1014.57	78.85
3/20/02 23:07	1014.57	78.85
3/20/02 23:08	1014.57	78.85
3/20/02 23:10	1014.58	78.85
3/20/02 23:11	1014.57	78.85
3/20/02 23:12	1014.57	78.85
3/20/02 23:13	1014.57	78.85
3/20/02 23:14	1014.58	78.85
3/20/02 23:16	1014.58	78.85
3/20/02 23:17	1014.58	78.85
3/20/02 23:18	1014.58	78.85
3/20/02 23:19	1014.58	78.85
3/20/02 23:20	1014.58	78.85
3/20/02 23:22	1014.58	78.85
3/20/02 23:23	1014.58	78.85
3/20/02 23:24	1014.58	78.85
3/20/02 23:25	1014.58	78.85
3/20/02 23:26	1014.58	78.85
3/20/02 23:28	1014.59	78.85
3/20/02 23:29	1014.59	78.85
3/20/02 23:30	1014.59	78.85
3/20/02 23:31	1014.59	78.85
3/20/02 23:32	1014.59	78.85
3/20/02 23:34	1014.59	78.85
3/20/02 23:35	1014.59	78.85
3/20/02 23:36	1014.59	78.85
3/20/02 23:37	1014.59	78.85
3/20/02 23:38	1014.59	78.85
3/20/02 23:40	1014.59	78.85
3/20/02 23:41	1014.59	78.85
3/20/02 23:42	1014.6	78.85
3/20/02 23:43	1014.6	78.85
3/20/02 23:44	1014.6	78.85
3/20/02 23:46	1014.6	78.85
3/20/02 23:47	1014.6	78.85
3/20/02 23:48	1014.6	78.85
3/20/02 23:49	1014.6	78.85
3/20/02 23:50	1014.6	78.85
3/20/02 23:52	1014.6	78.85
3/20/02 23:53	1014.6	78.85
3/20/02 23:54	1014.6	78.85
3/20/02 23:55	1014.6	78.85
3/20/02 23:56	1014.6	78.85
3/20/02 23:58	1014.61	78.85
3/20/02 23:59	1014.61	78.85
3/21/02 0:00	1014.61	78.85
3/21/02 0:01	1014.6	78.85
3/21/02 0:02	1014.61	78.85
3/21/02 0:04	1014.6	78.85
3/21/02 0:05	1014.61	78.85
3/21/02 0:06	1014.61	78.85
3/21/02 0:07	1014.61	78.85
3/21/02 0:08	1014.61	78.85
3/21/02 0:10	1014.61	78.85
3/21/02 0:11	1014.61	78.85
3/21/02 0:12	1014.61	78.85
3/21/02 0:13	1014.61	78.85
3/21/02 0:14	1014.61	78.85
3/21/02 0:16	1014.61	78.84
3/21/02 0:17	1014.61	78.83
3/21/02 0:18	1014.61	78.82
3/21/02 0:19	1014.61	78.82
3/21/02 0:20	1014.61	78.81
3/21/02 0:22	1014.61	78.79
3/21/02 0:23	1014.6	78.78
3/21/02 0:24	1014.61	78.76
3/21/02 0:25	1014.61	78.75
3/21/02 0:26	1014.61	78.74
3/21/02 0:28	1014.61	78.72
3/21/02 0:29	1014.62	78.71
3/21/02 0:30	1014.61	78.71
3/21/02 0:31	1014.62	78.7
3/21/02 0:32	1014.61	78.7
3/21/02 0:34	1014.61	78.69
3/21/02 0:35	1014.62	78.69
3/21/02 0:36	1014.62	78.69
3/21/02 0:37	1014.62	78.69
3/21/02 0:38	1014.61	78.69
3/21/02 0:40	1014.62	78.69
3/21/02 0:41	1014.61	78.69
3/21/02 0:42	1014.62	78.69
3/21/02 0:43	1014.62	78.69
3/21/02 0:44	1014.62	78.69
3/21/02 0:46	1014.62	78.68
3/21/02 0:47	1014.62	78.68
3/21/02 0:48	1014.62	78.68
3/21/02 0:49	1014.62	78.68
3/21/02 0:50	1014.62	78.68
3/21/02 0:52	1014.61	78.68
3/21/02 0:53	1014.62	78.68
3/21/02 0:54	1014.62	78.68
3/21/02 0:55	1014.62	78.68
3/21/02 0:56	1014.62	78.68
3/21/02 0:58	1014.62	78.68
3/21/02 0:59	1014.62	78.68
3/21/02 1:00	1014.62	78.68
3/21/02 1:01	1014.62	78.68
3/21/02 1:02	1014.62	78.68
3/21/02 1:04	1014.62	78.68
3/21/02 1:05	1014.62	78.68
3/21/02 1:06	1014.62	78.68
3/21/02 1:07	1014.62	78.68
3/21/02 1:08	1014.62	78.68
3/21/02 1:10	1014.62	78.68
3/21/02 1:11	1014.62	78.68
3/21/02 1:12	1014.62	78.68
3/21/02 1:13	1014.62	78.68
3/21/02 1:14	1014.62	78.68
3/21/02 1:16	1014.62	78.68
3/21/02 1:17	1014.62	78.68
3/21/02 1:18	1014.62	78.68
3/21/02 1:19	1014.62	78.68
3/21/02 1:20	1014.62	78.68
3/21/02 1:22	1014.62	78.68
3/21/02 1:23	1014.62	78.68
3/21/02 1:24	1014.62	78.68
3/21/02 1:25	1014.63	78.68
3/21/02 1:26	1014.63	78.68
3/21/02 1:28	1014.63	78.68
3/21/02 1:29	1014.62	78.68
3/21/02 1:30	1014.63	78.68
3/21/02 1:31	1014.63	78.68
3/21/02 1:32	1014.63	78.68
3/21/02 1:34	1014.63	78.68
3/21/02 1:35	1014.63	78.68
3/21/02 1:36	1014.63	78.68
3/21/02 1:37	1014.63	78.68
3/21/02 1:38	1014.64	78.68
3/21/02 1:40	1014.64	78.68
3/21/02 1:41	1014.64	78.68
3/21/02 1:42	1014.64	78.68
3/21/02 1:43	1014.64	78.68
3/21/02 1:44	1014.64	78.68
3/21/02 1:46	1014.65	78.68
3/21/02 1:47	1014.65	78.68
3/21/02 1:48	1014.65	78.68
3/21/02 1:49	1014.65	78.68
3/21/02 1:50	1014.65	78.68
3/21/02 1:52	1014.65	78.68
3/21/02 1:53	1014.65	78.68
3/21/02 1:54	1014.65	78.68
3/21/02 1:55	1014.66	78.68
3/21/02 1:56	1014.66	78.68
3/21/02 1:58	1014.66	78.68
3/21/02 1:59	1014.66	78.68
3/21/02 2:00	1014.66	78.68
3/21/02 2:01	1014.66	78.68
3/21/02 2:02	1014.66	78.68
3/21/02 2:04	1014.66	78.68
3/21/02 2:05	1014.66	78.68
3/21/02 2:06	1014.66	78.68
3/21/02 2:07	1014.66	78.68
3/21/02 2:08	1014.66	78.68
3/21/02 2:10	1014.67	78.68
3/21/02 2:11	1014.66	78.68
3/21/02 2:12	1014.67	78.68
3/21/02 2:13	1014.67	78.67
3/21/02 2:14	1014.67	78.67
3/21/02 2:16	1014.67	78.67
3/21/02 2:17	1014.67	78.67
3/21/02 2:18	1014.67	78.67
3/21/02 2:19	1014.67	78.67
3/21/02 2:20	1014.67	78.67
3/21/02 2:22	1014.67	78.68
3/21/02 2:23	1014.67	78.68
3/21/02 2:24	1014.67	78.68
3/21/02 2:25	1014.67	78.68
3/21/02 2:26	1014.67	78.68
3/21/02 2:28	1014.67	78.68
3/21/02 2:29	1014.67	78.68
3/21/02 2:30	1014.67	78.68
3/21/02 2:31	1014.67	78.68
3/21/02 2:32	1014.67	78.68
3/21/02 2:34	1014.68	78.68
3/21/02 2:35	1014.68	78.68
3/21/02 2:36	1014.67	78.68
3/21/02 2:37	1014.68	78.68
3/21/02 2:38	1014.68	78.68
3/21/02 2:40	1014.68	78.68
3/21/02 2:41	1014.68	78.68
3/21/02 2:42	1014.68	78.68
3/21/02 2:43	1014.68	78.68
3/21/02 2:44	1014.68	78.68
3/21/02 2:46	1014.68	78.67
3/21/02 2:47	1014.68	78.67
3/21/02 2:48	1014.68	78.67
3/21/02 2:49	1014.68	78.67
3/21/02 2:50	1014.68	78.67
3/21/02 2:52	1014.68	78.67
3/21/02 2:53	1014.68	78.67
3/21/02 2:54	1014.68	78.68
3/21/02 2:55	1014.68	78.68
3/21/02 2:56	1014.68	78.68
3/21/02 2:58	1014.68	78.68
3/21/02 2:59	1014.68	78.68
3/21/02 3:00	1014.68	78.68
3/21/02 3:01	1014.68	78.68
3/21/02 3:02	1014.68	78.68
3/21/02 3:04	1014.68	78.68
3/21/02 3:05	1014.69	78.68
3/21/02 3:06	1014.69	78.68
3/21/02 3:07	1014.69	78.68
3/21/02 3:08	1014.69	78.68
3/21/02 3:10	1014.69	78.68
3/21/02 3:11	1014.69	78.68
3/21/02 3:12	1014.69	78.68
3/21/02 3:13	1014.69	78.68
3/21/02 3:14	1014.69	78.68
3/21/02 3:16	1014.69	78.68
3/21/02 3:17	1014.69	78.68
3/21/02 3:18	1014.69	78.68
3/21/02 3:19	1014.69	78.68
3/21/02 3:20	1014.69	78.68
3/21/02 3:22	1014.69	78.68
3/21/02 3:23	1014.69	78.68
3/21/02 3:24	1014.69	78.68
3/21/02 3:25	1014.69	78.68
3/21/02 3:26	1014.7	78.68
3/21/02 3:28	1014.7	78.68
3/21/02 3:29	1014.69	78.68
3/21/02 3:30	1014.69	78.68
3/21/02 3:31	1014.69	78.68
3/21/02 3:32	1014.69	78.68
3/21/02 3:34	1014.69	78.68
3/21/02 3:35	1014.7	78.68
3/21/02 3:36	1014.7	78.68
3/21/02 3:37	1014.7	78.68
3/21/02 3:38	1014.7	78.68
3/21/02 3:40	1014.7	78.68
3/21/02 3:41	1014.7	78.68
3/21/02 3:42	1014.69	78.68
3/21/02 3:43	1014.7	78.68
3/21/02 3:44	1014.7	78.68
3/21/02 3:46	1014.7	78.68
3/21/02 3:47	1014.7	78.68
3/21/02 3:48	1014.7	78.68
3/21/02 3:49	1014.7	78.68
3/21/02 3:50	1014.7	78.68
3/21/02 3:52	1014.7	78.68
3/21/02 3:53	1014.7	78.68
3/21/02 3:54	1014.7	78.68
3/21/02 3:55	1014.7	78.68
3/21/02 3:56	1014.7	78.68
3/21/02 3:58	1014.7	78.68
3/21/02 3:59	1014.7	78.68
3/21/02 4:00	1014.7	78.68
3/21/02 4:01	1014.7	78.68
3/21/02 4:02	1014.7	78.68
3/21/02 4:04	1014.7	78.68
3/21/02 4:05	1014.7	78.68
3/21/02 4:06	1014.7	78.68
3/21/02 4:07	1014.7	78.68
3/21/02 4:08	1014.7	78.68
3/21/02 4:10	1014.7	78.68
3/21/02 4:11	1014.7	78.68
3/21/02 4:12	1014.7	78.68
3/21/02 4:13	1014.7	78.68
3/21/02 4:14	1014.71	78.68
3/21/02 4:16	1014.71	78.68
3/21/02 4:17	1014.7	78.68
3/21/02 4:18	1014.71	78.68
3/21/02 4:19	1014.7	78.68
3/21/02 4:20	1014.71	78.68
3/21/02 4:22	1014.7	78.68
3/21/02 4:23	1014.71	78.68
3/21/02 4:24	1014.71	78.68
3/21/02 4:25	1014.71	78.68
3/21/02 4:26	1014.7	78.68
3/21/02 4:28	1014.71	78.68
3/21/02 4:29	1014.71	78.68
3/21/02 4:30	1014.71	78.68
3/21/02 4:31	1014.71	78.68
3/21/02 4:32	1014.71	78.68
3/21/02 4:34	1014.71	78.68
3/21/02 4:35	1014.71	78.68
3/21/02 4:36	1014.71	78.68
3/21/02 4:37	1014.71	78.68
3/21/02 4:38	1014.71	78.68
3/21/02 4:40	1014.71	78.68
3/21/02 4:41	1014.71	78.68
3/21/02 4:42	1014.71	78.68
3/21/02 4:43	1014.71	78.68
3/21/02 4:44	1014.71	78.68
3/21/02 4:46	1014.71	78.68
3/21/02 4:47	1014.71	78.68
3/21/02 4:48	1014.71	78.68
3/21/02 4:49	1014.71	78.68
3/21/02 4:50	1014.72	78.68
3/21/02 4:52	1014.71	78.68
3/21/02 4:53	1014.71	78.68
3/21/02 4:54	1014.71	78.68
3/21/02 4:55	1014.71	78.68
3/21/02 4:56	1014.71	78.68
3/21/02 4:58	1014.72	78.68
3/21/02 4:59	1014.72	78.68
3/21/02 5:00	1014.72	78.68
3/21/02 5:01	1014.72	78.68
3/21/02 5:02	1014.72	78.68
3/21/02 5:04	1014.71	78.68
3/21/02 5:05	1014.72	78.68
3/21/02 5:06	1014.72	78.68
3/21/02 5:07	1014.72	78.68
3/21/02 5:08	1014.72	78.68
3/21/02 5:10	1014.72	78.68
3/21/02 5:11	1014.72	78.68
3/21/02 5:12	1014.72	78.68
3/21/02 5:13	1014.72	78.69
3/21/02 5:14	1014.72	78.69
3/21/02 5:16	1014.72	78.69
3/21/02 5:17	1014.72	78.69
3/21/02 5:18	1014.72	78.68
3/21/02 5:19	1014.72	78.68
3/21/02 5:20	1014.72	78.68
3/21/02 5:22	1014.72	78.68
3/21/02 5:23	1014.73	78.68
3/21/02 5:24	1014.73	78.69
3/21/02 5:25	1014.73	78.69
3/21/02 5:26	1014.73	78.69
3/21/02 5:28	1014.73	78.69
3/21/02 5:29	1014.73	78.69
3/21/02 5:30	1014.73	78.69
3/21/02 5:31	1014.73	78.69
3/21/02 5:32	1014.73	78.69
3/21/02 5:34	1014.73	78.69
3/21/02 5:35	1014.73	78.69

City of Pompano Beach

Injection Test

Date Time	DOWNHOLE (psi)	DOWNHOLE Temp (F)
3/21/02 5:36	1014.73	78.69
3/21/02 5:37	1014.74	78.69
3/21/02 5:38	1014.74	78.69
3/21/02 5:40	1014.74	78.69
3/21/02 5:41	1014.74	78.69
3/21/02 5:42	1014.74	78.69
3/21/02 5:43	1014.74	78.69
3/21/02 5:44	1014.74	78.69
3/21/02 5:46	1014.74	78.69
3/21/02 5:47	1014.74	78.69
3/21/02 5:48	1014.74	78.69
3/21/02 5:49	1014.74	78.68
3/21/02 5:50	1014.74	78.68
3/21/02 5:52	1014.74	78.68
3/21/02 5:53	1014.74	78.68
3/21/02 5:54	1014.74	78.68
3/21/02 5:55	1014.75	78.68
3/21/02 5:56	1014.75	78.68
3/21/02 5:58	1014.75	78.68
3/21/02 5:59	1014.75	78.68
3/21/02 6:00	1014.75	78.68
3/21/02 6:01	1014.75	78.69
3/21/02 6:02	1014.75	78.69
3/21/02 6:04	1014.76	78.69
3/21/02 6:05	1014.76	78.69
3/21/02 6:06	1014.76	78.69
3/21/02 6:07	1014.76	78.69
3/21/02 6:08	1014.76	78.69
3/21/02 6:10	1014.76	78.69
3/21/02 6:11	1014.76	78.69
3/21/02 6:12	1014.76	78.69
3/21/02 6:13	1014.77	78.69
3/21/02 6:14	1014.76	78.69
3/21/02 6:16	1014.76	78.69
3/21/02 6:17	1014.77	78.69
3/21/02 6:18	1014.77	78.69
3/21/02 6:19	1014.77	78.68
3/21/02 6:20	1014.77	78.68
3/21/02 6:22	1014.77	78.68
3/21/02 6:23	1014.77	78.68
3/21/02 6:24	1014.77	78.68
3/21/02 6:25	1014.78	78.68
3/21/02 6:26	1014.77	78.69
3/21/02 6:28	1014.78	78.69
3/21/02 6:29	1014.78	78.69
3/21/02 6:30	1014.78	78.69
3/21/02 6:31	1014.78	78.69
3/21/02 6:32	1014.78	78.69
3/21/02 6:34	1014.79	78.69
3/21/02 6:35	1014.79	78.69
3/21/02 6:36	1014.79	78.69
3/21/02 6:37	1014.79	78.69
3/21/02 6:38	1014.79	78.69
3/21/02 6:40	1014.8	78.69
3/21/02 6:41	1014.8	78.69
3/21/02 6:42	1014.8	78.69
3/21/02 6:43	1014.79	78.69
3/21/02 6:44	1014.8	78.69
3/21/02 6:46	1014.8	78.69
3/21/02 6:47	1014.8	78.69
3/21/02 6:48	1014.8	78.69
3/21/02 6:49	1014.8	78.69
3/21/02 6:50	1014.8	78.69
3/21/02 6:52	1014.8	78.69
3/21/02 6:53	1014.8	78.69
3/21/02 6:54	1014.8	78.69
3/21/02 6:55	1014.8	78.69
3/21/02 6:56	1014.81	78.69
3/21/02 6:58	1014.81	78.69
3/21/02 6:59	1014.81	78.69
3/21/02 7:00	1014.81	78.69
3/21/02 7:01	1014.81	78.69
3/21/02 7:02	1014.81	78.69
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3/21/02 7:07	1014.82	78.69
3/21/02 7:08	1014.82	78.69
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3/21/02 7:12	1014.83	78.69
3/21/02 7:13	1014.83	78.69
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3/21/02 7:17	1014.83	78.69
3/21/02 7:18	1014.84	78.69
3/21/02 7:19	1014.84	78.69
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3/21/02 7:28	1014.85	78.69
3/21/02 7:29	1014.85	78.69
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3/21/02 7:38	1014.86	78.7
3/21/02 7:40	1014.86	78.69
3/21/02 7:41	1014.86	78.69
3/21/02 7:42	1014.86	78.69
3/21/02 7:43	1014.86	78.69
3/21/02 7:44	1014.86	78.69
3/21/02 7:46	1014.87	78.69
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3/21/02 7:52	1014.87	78.7
3/21/02 7:53	1014.87	78.7
3/21/02 7:54	1014.88	78.7
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3/21/02 8:04	1014.89	78.7
3/21/02 8:05	1014.89	78.69
3/21/02 8:06	1014.89	78.69
3/21/02 8:07	1014.89	78.69
3/21/02 8:08	1014.89	78.69
3/21/02 8:10	1014.89	78.69
3/21/02 8:11	1014.89	78.69
3/21/02 8:12	1014.9	78.7
3/21/02 8:13	1014.9	78.7
3/21/02 8:14	1014.9	78.7
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3/21/02 8:18	1014.9	78.7
3/21/02 8:19	1014.91	78.7
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3/21/02 8:22	1014.91	78.7
3/21/02 8:23	1014.91	78.7
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3/21/02 8:30	1014.92	78.7
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3/21/02 8:34	1014.92	78.7
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3/21/02 8:38	1014.93	78.7
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3/21/02 8:46	1014.94	78.7
3/21/02 8:47	1014.94	78.7
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3/21/02 8:49	1014.94	78.71
3/21/02 8:50	1014.94	78.71
3/21/02 8:52	1014.95	78.71
3/21/02 8:53	1014.94	78.71
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3/21/02 8:55	1014.95	78.7
3/21/02 8:56	1014.95	78.7
3/21/02 8:58	1014.95	78.7
3/21/02 8:59	1014.95	78.7
3/21/02 9:00	1014.95	78.71
3/21/02 9:01	1014.96	78.71
3/21/02 9:02	1014.96	78.71
3/21/02 9:04	1014.96	78.71
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3/21/02 9:08	1014.87	78.74
3/21/02 9:10	1014.86	78.75
3/21/02 9:11	1014.86	78.76
3/21/02 9:12	1014.86	78.77
3/21/02 9:13	1014.87	78.77
3/21/02 9:14	1014.87	78.78
3/21/02 9:16	1014.87	78.79
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3/21/02 9:18	1014.88	78.79
3/21/02 9:19	1014.88	78.79
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3/21/02 9:22	1014.88	78.79
3/21/02 9:23	1014.89	78.79
3/21/02 9:24	1014.89	78.79
3/21/02 9:25	1014.89	78.79
3/21/02 9:26	1014.89	78.79
3/21/02 9:28	1014.9	78.79
3/21/02 9:29	1014.9	78.79
3/21/02 9:30	1014.9	78.79
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3/21/02 9:32	1014.9	78.79
3/21/02 9:34	1014.91	78.79
3/21/02 9:35	1014.91	78.79
3/21/02 9:36	1014.91	78.79
3/21/02 9:37	1014.91	78.79
3/21/02 9:38	1014.91	78.8
3/21/02 9:40	1014.91	78.79
3/21/02 9:41	1014.92	78.79
3/21/02 9:42	1014.92	78.79
3/21/02 9:43	1014.92	78.79
3/21/02 9:44	1014.92	78.79
3/21/02 9:46	1014.93	78.79
3/21/02 9:47	1014.93	78.79
3/21/02 9:48	1014.93	78.79
3/21/02 9:49	1014.93	78.79
3/21/02 9:50	1014.93	78.8
3/21/02 9:52	1014.94	78.8
3/21/02 9:53	1014.94	78.8
3/21/02 9:54	1014.94	78.8
3/21/02 9:55	1014.94	78.79
3/21/02 9:56	1014.94	78.79
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3/21/02 9:59	1014.94	78.79
3/21/02 10:00	1014.95	78.79
3/21/02 10:01	1014.95	78.79
3/21/02 10:02	1014.93	78.8
3/21/02 10:04	1015.22	78.79
3/21/02 10:05	1015.21	78.79
3/21/02 10:06	1015.2	78.79
3/21/02 10:07	1015.2	78.79
3/21/02 10:08	1015.2	78.78
3/21/02 10:10	1015.19	78.78
3/21/02 10:11	1015.19	78.77
3/21/02 10:12	1015.19	78.76
3/21/02 10:13	1015.19	78.76
3/21/02 10:14	1015.19	78.75
3/21/02 10:16	1015.18	78.74
3/21/02 10:17	1015.18	78.73
3/21/02 10:18	1015.18	78.72
3/21/02 10:19	1015.18	78.71
3/21/02 10:20	1015.18	78.7
3/21/02 10:22	1015.18	78.69
3/21/02 10:23	1015.18	78.68
3/21/02 10:24	1015.18	78.67
3/21/02 10:25	1015.18	78.66
3/21/02 10:26	1015.17	78.66
3/21/02 10:28	1015.17	78.64
3/21/02 10:29	1015.17	78.63
3/21/02 10:30	1015.17	78.62
3/21/02 10:31	1015.17	78.62
3/21/02 10:32	1015.17	78.61
3/21/02 10:34	1015.17	78.59
3/21/02 10:35	1015.17	78.59
3/21/02 10:36	1015.17	78.58
3/21/02 10:37	1015.17	78.57
3/21/02 10:38	1015.17	78.56
3/21/02 10:40	1015.17	78.55
3/21/02 10:41	1015.17	78.54
3/21/02 10:42	1015.17	78.53
3/21/02 10:43	1015.16	78.52
3/21/02 10:44	1015.16	78.51
3/21/02 10:46	1015.16	78.5
3/21/02 10:47	1015.16	78.49
3/21/02 10:48	1015.16	78.48
3/21/02 10:49	1015.16	78.47
3/21/02 10:50	1015.16	78.47
3/21/02 10:52	1015.17	78.45
3/21/02 10:53	1015.16	78.44
3/21/02 10:54	1015.16	78.43
3/21/02 10:55	1015.16	78.42
3/21/02 10:56	1015.16	78.41
3/21/02 10:58	1015.16	78.39
3/21/02 10:59	1015.16	78.39
3/21/02 11:00	1015.16	78.38
3/21/02 11:01	1015.16	78.37
3/21/02 11:02	1015.15	78.36
3/21/02 11:04	1015.15	78.35
3/21/02 11:05	1015.16	78.34
3/21/02 11:06	1015.16	78.33
3/21/02 11:07	1015.16	78.33
3/21/02 11:08	1015.15	78.32
3/21/02 11:10	1015.15	78.3
3/21/02 11:11	1015.15	78.3
3/21/02 11:12	1015.15	78.29
3/21/02 11:13	1015.15	78.28
3/21/02 11:14	1015.15	78.27
3/21/02 11:16	1015.15	78.26
3/21/02 11:17	1015.15	78.25
3/21/02 11:18	1015.15	78.24
3/21/02 11:19	1015.15	78.24
3/21/02 11:20	1015.15	78.23
3/21/02 11:22	1015.15	78.21
3/21/02 11:23	1015.14	78.2
3/21/02 11:24	1015.14	78.19
3/21/02 11:25	1015.14	78.19
3/21/02 11:26	1015.14	78.18
3/21/02 11:28	1015.14	78.16
3/21/02 11:29	1015.15	78.16
3/21/02 11:30	1015.14	78.15
3/21/02 11:31	1015.14	78.14
3/21/02 11:32	1015.14	78.14
3/21/02 11:34	1015.14	78.12
3/21/02 11:35	1015.14	78.11
3/21/02 11:36	1015.14	78.1
3/21/02 11:37	1015.15	78.1
3/21/02 11:38	1015.14	78.09
3/21/02 11:40	1015.14	78.07
3/21/02 11:41	1015.14	78.07
3/21/02 11:42	1015.14	78.06
3/21/02 11:43	1015.14	78.05
3/21/02 11:44	1015.14	78.05
3/21/02 11:46	1015.13	78.03
3/21/02 11:47	1015.13	78.02
3/21/02 11:48	1015.13	78.01
3/21/02 11:49	1015.13	78
3/21/02 11:50	1015.13	78
3/21/02 11:52	1015.13	77.98
3/21/02 11:53	1015.13	77.98
3/21/02 11:54	1015.13	77.97
3/21/02 11:55	1015.13	77.97
3/21/02 11:56	1015.13	77.96
3/21/02 11:58	1015.13	77.95
3/21/02 11:59	1015.13	77.94
3/21/02 12:00	1015.13	77.93
3/21/02 12:01	1015.13	77.93
3/21/02 12:02	1015.13	77.92
3/21/02 12:04	1015.13	77.91
3/21/02 12:05	1015.13	77.9
3/21/02 12:06	1015.13	77.9
3/21/02 12:07	1015.13	77.89
3/21/02 12:08	1015.13	77.89
3/21/02 12:10	1015.12	77.87
3/21/02 12:11	1015.12	77.87
3/21/02 12:12	1015.12	77.86
3/21/02 12:13	1015.13	77.85
3/21/02 12:14	1015.12	77.84
3/21/02 12:16	1015.12	77.83
3/21/02 12:17	1015.12	77.82
3/21/02 12:18	1015.12	77.82
3/21/02 12:19	1015.12	77.81
3/21/02 12:20	1015.11	77.81
3/21/02 12:22	1015.11	77.79
3/21/02 12:23	1015.11	77.78
3/21/02 12:24	1015.12	77.78
3/21/02 12:25	1015.11	77.77
3/21/02 12:26	1015.11	77.76
3/21/02 12:28	1015.12	77.75
3/21/02 12:29	1015.11	77.74
3/21/02 12:30	1015.11	77.74
3/21/02 12:31	1015.11	77.73
3/21/02 12:32	1015.11	77.72
3/21/02 12:34	1015.11	77.71
3/21/02 12:35	1015.11	77.71
3/21/02 12:36	1015.11	77.7
3/21/02 12:37	1015.11	77.69
3/21/02 12:38	1015.1	77.69
3/21/02 12:40	1015.1	77.68
3/21/02 12:41	1015.1	77.67
3/21/02 12:42	1015.1	77.66
3/21/02 12:43	1015.1	77.65
3/21/02 12:44	1015.1	77.65
3/21/02 12:46	1015.1	77.63
3/21/02 12:47	1015.1	77.63

City of Pompano Beach

Injection Test

	DOWNHOLE	DOWNHOLE
Date Time	(psi)	Temp (F)
3/21/02 12:48	1015.1	77.62
3/21/02 12:49	1015.1	77.62
3/21/02 12:50	1015.09	77.61
3/21/02 12:52	1015.1	77.61
3/21/02 12:53	1015.09	77.6
3/21/02 12:54	1015.1	77.6
3/21/02 12:55	1015.1	77.59
3/21/02 12:56	1015.1	77.59
3/21/02 12:58	1015.1	77.57
3/21/02 12:59	1015.09	77.57
3/21/02 13:00	1015.09	77.56
3/21/02 13:01	1015.09	77.55
3/21/02 13:02	1015.08	77.54
3/21/02 13:04	1015.09	77.53
3/21/02 13:05	1015.09	77.53
3/21/02 13:06	1015.09	77.52
3/21/02 13:07	1015.09	77.52
3/21/02 13:08	1015.08	77.51
3/21/02 13:10	1015.08	77.5
3/21/02 13:11	1015.08	77.49
3/21/02 13:12	1015.08	77.49
3/21/02 13:13	1015.08	77.48
3/21/02 13:14	1015.08	77.47
3/21/02 13:16	1015.08	77.46
3/21/02 13:17	1015.07	77.46
3/21/02 13:18	1015.08	77.45
3/21/02 13:19	1015.08	77.45
3/21/02 13:20	1015.08	77.44
3/21/02 13:22	1015.07	77.43
3/21/02 13:23	1015.07	77.43
3/21/02 13:24	1015.07	77.43
3/21/02 13:25	1015.07	77.42
3/21/02 13:26	1015.07	77.42
3/21/02 13:28	1015.06	77.41
3/21/02 13:29	1015.06	77.4
3/21/02 13:30	1015.07	77.4
3/21/02 13:31	1015.07	77.39
3/21/02 13:32	1015.06	77.38
3/21/02 13:34	1015.06	77.37
3/21/02 13:35	1015.06	77.37
3/21/02 13:36	1015.06	77.36
3/21/02 13:37	1015.06	77.36
3/21/02 13:38	1015.07	77.35
3/21/02 13:40	1015.06	77.35
3/21/02 13:41	1015.06	77.35
3/21/02 13:42	1015.05	77.34
3/21/02 13:43	1015.05	77.34
3/21/02 13:44	1015.05	77.34
3/21/02 13:46	1015.06	77.34
3/21/02 13:47	1015.05	77.33
3/21/02 13:48	1015.05	77.33
3/21/02 13:49	1015.05	77.33
3/21/02 13:50	1015.05	77.33
3/21/02 13:52	1015.03	77.31
3/21/02 13:53	1015.03	77.3
3/21/02 13:54	1015.04	77.29
3/21/02 13:55	1015.03	77.28
3/21/02 13:56	1015.04	77.27
3/21/02 13:58	1015.04	77.25
3/21/02 13:59	1015.05	77.25
3/21/02 14:00	1015.05	77.25
3/21/02 14:01	1015.04	77.25
3/21/02 14:02	1015.05	77.24
3/21/02 14:04	1015.03	77.24
3/21/02 14:05	1015.03	77.24
3/21/02 14:06	1015.03	77.23
3/21/02 14:07	1015.03	77.23
3/21/02 14:08	1015.03	77.23
3/21/02 14:10	1015.03	77.22
3/21/02 14:11	1015.03	77.22
3/21/02 14:12	1015.02	77.21
3/21/02 14:13	1015.02	77.21
3/21/02 14:14	1015.02	77.2
3/21/02 14:16	1015.02	77.19
3/21/02 14:17	1015.02	77.18
3/21/02 14:18	1015.02	77.18
3/21/02 14:19	1015.01	77.17
3/21/02 14:20	1015.01	77.16
3/21/02 14:22	1015.02	77.15
3/21/02 14:23	1015.01	77.15
3/21/02 14:24	1015.01	77.14
3/21/02 14:25	1015.03	77.14
3/21/02 14:26	1015.02	77.13
3/21/02 14:28	1015.01	77.13
3/21/02 14:29	1015.02	77.12
3/21/02 14:30	1015.01	77.12
3/21/02 14:31	1015.01	77.12
3/21/02 14:32	1015.01	77.11
3/21/02 14:34	1015	77.1
3/21/02 14:35	1015.01	77.1
3/21/02 14:36	1015.01	77.1
3/21/02 14:37	1015	77.09
3/21/02 14:38	1015	77.09
3/21/02 14:40	1015	77.08
3/21/02 14:41	1015	77.07
3/21/02 14:42	1015	77.06
3/21/02 14:43	1014.99	77.06
3/21/02 14:44	1014.99	77.05
3/21/02 14:46	1014.99	77.03
3/21/02 14:47	1014.99	77.03
3/21/02 14:48	1014.99	77.02
3/21/02 14:49	1014.98	77.02
3/21/02 14:50	1014.99	77.01
3/21/02 14:52	1014.98	77.01
3/21/02 14:53	1014.99	77.01
3/21/02 14:54	1014.99	77.01
3/21/02 14:55	1014.99	77.01
3/21/02 14:56	1014.99	77
3/21/02 14:58	1014.98	77
3/21/02 14:59	1014.98	76.99
3/21/02 15:00	1014.97	76.98
3/21/02 15:01	1014.98	76.97
3/21/02 15:02	1014.97	76.97
3/21/02 15:04	1014.97	76.95
3/21/02 15:05	1014.97	76.95
3/21/02 15:06	1014.96	76.94
3/21/02 15:07	1014.97	76.94
3/21/02 15:08	1014.98	76.93
3/21/02 15:10	1014.96	76.93
3/21/02 15:11	1014.97	76.93
3/21/02 15:12	1014.97	76.93
3/21/02 15:13	1014.96	76.93
3/21/02 15:14	1014.95	76.93
3/21/02 15:16	1014.96	76.92
3/21/02 15:17	1014.96	76.92
3/21/02 15:18	1014.96	76.91
3/21/02 15:19	1014.95	76.91
3/21/02 15:20	1014.95	76.91
3/21/02 15:22	1014.95	76.9
3/21/02 15:23	1014.95	76.89
3/21/02 15:24	1014.95	76.88
3/21/02 15:25	1014.95	76.88
3/21/02 15:26	1014.95	76.87
3/21/02 15:28	1014.95	76.86
3/21/02 15:29	1014.94	76.86
3/21/02 15:30	1014.95	76.86
3/21/02 15:31	1014.94	76.86
3/21/02 15:32	1014.93	76.86
3/21/02 15:34	1014.93	76.85
3/21/02 15:35	1014.93	76.85
3/21/02 15:36	1014.93	76.85
3/21/02 15:37	1014.93	76.84
3/21/02 15:38	1014.94	76.84
3/21/02 15:40	1014.93	76.83
3/21/02 15:41	1014.92	76.82
3/21/02 15:42	1014.92	76.81
3/21/02 15:43	1014.91	76.81
3/21/02 15:44	1014.92	76.8
3/21/02 15:46	1014.92	76.79
3/21/02 15:47	1014.91	76.79
3/21/02 15:48	1014.92	76.78
3/21/02 15:49	1014.92	76.78
3/21/02 15:50	1014.91	76.77
3/21/02 15:52	1014.92	76.77
3/21/02 15:53	1014.91	76.76
3/21/02 15:54	1014.91	76.76
3/21/02 15:55	1014.92	76.75
3/21/02 15:56	1014.92	76.75
3/21/02 15:58	1014.91	76.74
3/21/02 15:59	1014.9	76.74
3/21/02 16:00	1014.9	76.74
3/21/02 16:01	1014.91	76.74
3/21/02 16:02	1014.9	76.74
3/21/02 16:04	1014.9	76.74
3/21/02 16:05	1014.89	76.73
3/21/02 16:06	1014.9	76.73
3/21/02 16:07	1014.91	76.72
3/21/02 16:08	1014.9	76.72
3/21/02 16:10	1014.9	76.71
3/21/02 16:11	1014.9	76.71
3/21/02 16:12	1014.9	76.71
3/21/02 16:13	1014.9	76.71
3/21/02 16:14	1014.89	76.71
3/21/02 16:16	1014.88	76.7
3/21/02 16:17	1014.89	76.69
3/21/02 16:18	1014.88	76.69
3/21/02 16:19	1014.88	76.68
3/21/02 16:20	1014.88	76.67
3/21/02 16:22	1014.89	76.66
3/21/02 16:23	1014.87	76.66
3/21/02 16:24	1014.87	76.66
3/21/02 16:25	1014.88	76.66
3/21/02 16:26	1014.88	76.66
3/21/02 16:28	1014.88	76.65
3/21/02 16:29	1014.88	76.65
3/21/02 16:30	1014.87	76.65
3/21/02 16:31	1014.87	76.65
3/21/02 16:32	1014.85	76.65
3/21/02 16:34	1014.86	76.64
3/21/02 16:35	1014.86	76.63
3/21/02 16:36	1014.87	76.63
3/21/02 16:37	1014.86	76.62
3/21/02 16:38	1014.85	76.62
3/21/02 16:40	1014.86	76.61
3/21/02 16:41	1014.86	76.61
3/21/02 16:42	1014.86	76.61
3/21/02 16:43	1014.85	76.6
3/21/02 16:44	1014.86	76.6
3/21/02 16:46	1014.85	76.59
3/21/02 16:47	1014.83	76.58
3/21/02 16:48	1014.84	76.58
3/21/02 16:49	1014.85	76.57
3/21/02 16:50	1014.84	76.57
3/21/02 16:52	1014.84	76.56
3/21/02 16:53	1014.84	76.55
3/21/02 16:54	1014.84	76.55
3/21/02 16:55	1014.84	76.55
3/21/02 16:56	1014.83	76.54
3/21/02 16:58	1014.84	76.53
3/21/02 16:59	1014.83	76.53
3/21/02 17:00	1014.82	76.53
3/21/02 17:01	1014.83	76.53
3/21/02 17:02	1014.83	76.53
3/21/02 17:04	1014.84	76.53
3/21/02 17:05	1014.84	76.53
3/21/02 17:06	1014.83	76.53
3/21/02 17:07	1014.83	76.53
3/21/02 17:08	1014.83	76.53
3/21/02 17:10	1014.82	76.53
3/21/02 17:11	1014.82	76.53
3/21/02 17:12	1014.82	76.52
3/21/02 17:13	1014.82	76.52
3/21/02 17:14	1014.82	76.51
3/21/02 17:16	1014.82	76.51
3/21/02 17:17	1014.82	76.5
3/21/02 17:18	1014.81	76.5
3/21/02 17:19	1014.82	76.5
3/21/02 17:20	1014.83	76.5
3/21/02 17:22	1014.81	76.49
3/21/02 17:23	1014.81	76.49
3/21/02 17:24	1014.81	76.48
3/21/02 17:25	1014.82	76.48
3/21/02 17:26	1014.82	76.48
3/21/02 17:28	1014.81	76.47
3/21/02 17:29	1014.82	76.47
3/21/02 17:30	1014.82	76.47
3/21/02 17:31	1014.81	76.47
3/21/02 17:32	1014.8	76.47
3/21/02 17:34	1014.8	76.47
3/21/02 17:35	1014.8	76.46
3/21/02 17:36	1014.8	76.45
3/21/02 17:37	1014.82	76.44
3/21/02 17:38	1014.82	76.43
3/21/02 17:40	1014.8	76.43
3/21/02 17:41	1014.8	76.43
3/21/02 17:42	1014.8	76.43
3/21/02 17:43	1014.79	76.42
3/21/02 17:44	1014.79	76.42
3/21/02 17:46	1014.79	76.42
3/21/02 17:47	1014.79	76.41
3/21/02 17:48	1014.79	76.41
3/21/02 17:49	1014.79	76.4
3/21/02 17:50	1014.79	76.39
3/21/02 17:52	1014.78	76.39
3/21/02 17:53	1014.79	76.39
3/21/02 17:54	1014.79	76.39
3/21/02 17:55	1014.78	76.39
3/21/02 17:56	1014.78	76.39
3/21/02 17:58	1014.77	76.38
3/21/02 17:59	1014.78	76.38
3/21/02 18:00	1014.79	76.37
3/21/02 18:01	1014.78	76.37
3/21/02 18:02	1014.78	76.36
3/21/02 18:04	1014.77	76.35
3/21/02 18:05	1014.77	76.35
3/21/02 18:06	1014.77	76.35
3/21/02 18:07	1014.79	76.35
3/21/02 18:08	1014.79	76.35
3/21/02 18:10	1014.76	76.34
3/21/02 18:11	1014.76	76.33
3/21/02 18:12	1014.76	76.32
3/21/02 18:13	1014.76	76.31
3/21/02 18:14	1014.76	76.3
3/21/02 18:16	1014.79	76.28
3/21/02 18:17	1014.78	76.28
3/21/02 18:18	1014.77	76.28
3/21/02 18:19	1014.76	76.27
3/21/02 18:20	1014.76	76.27
3/21/02 18:22	1014.77	76.27
3/21/02 18:23	1014.78	76.27
3/21/02 18:24	1014.75	76.27
3/21/02 18:25	1014.76	76.27
3/21/02 18:26	1014.76	76.26
3/21/02 18:28	1014.76	76.26
3/21/02 18:29	1014.76	76.25
3/21/02 18:30	1014.75	76.24
3/21/02 18:31	1014.75	76.23
3/21/02 18:32	1014.75	76.22
3/21/02 18:34	1014.76	76.22
3/21/02 18:35	1014.78	76.23
3/21/02 18:36	1014.78	76.23
3/21/02 18:37	1014.76	76.24
3/21/02 18:38	1014.76	76.25
3/21/02 18:40	1014.76	76.25
3/21/02 18:41	1014.75	76.24
3/21/02 18:42	1014.76	76.24
3/21/02 18:43	1014.77	76.23
3/21/02 18:44	1014.76	76.22
3/21/02 18:46	1014.75	76.21
3/21/02 18:47	1014.74	76.2
3/21/02 18:48	1014.74	76.2
3/21/02 18:49	1014.75	76.19
3/21/02 18:50	1014.75	76.18
3/21/02 18:52	1014.76	76.18
3/21/02 18:53	1014.75	76.19
3/21/02 18:54	1014.75	76.19
3/21/02 18:55	1014.74	76.2
3/21/02 18:56	1014.74	76.21
3/21/02 18:58	1014.75	76.21
3/21/02 18:59	1014.74	76.2
3/21/02 19:00	1014.74	76.19
3/21/02 19:01	1014.75	76.19
3/21/02 19:02	1014.75	76.18
3/21/02 19:04	1014.73	76.17
3/21/02 19:05	1014.73	76.17
3/21/02 19:06	1014.73	76.16
3/21/02 19:07	1014.73	76.15
3/21/02 19:08	1014.73	76.15
3/21/02 19:10	1014.74	76.14
3/21/02 19:11	1014.75	76.14
3/21/02 19:12	1014.75	76.14
3/21/02 19:13	1014.74	76.14
3/21/02 19:14	1014.74	76.14
3/21/02 19:16	1014.75	76.14
3/21/02 19:17	1014.74	76.13
3/21/02 19:18	1014.73	76.13
3/21/02 19:19	1014.72	76.12
3/21/02 19:20	1014.72	76.12
3/21/02 19:22	1014.74	76.11
3/21/02 19:23	1014.71	76.11
3/21/02 19:24	1014.72	76.11
3/21/02 19:25	1014.73	76.11
3/21/02 19:26	1014.74	76.11
3/21/02 19:28	1014.73	76.1
3/21/02 19:29	1014.72	76.1
3/21/02 19:30	1014.73	76.09
3/21/02 19:31	1014.72	76.09
3/21/02 19:32	1014.74	76.08
3/21/02 19:34	1014.74	76.08
3/21/02 19:35	1014.73	76.08
3/21/02 19:36	1014.73	76.08
3/21/02 19:37	1014.73	76.07
3/21/02 19:38	1014.72	76.07
3/21/02 19:40	1014.73	76.07
3/21/02 19:41	1014.73	76.07
3/21/02 19:42	1014.74	76.06
3/21/02 19:43	1014.74	76.06
3/21/02 19:44	1014.72	76.06
3/21/02 19:46	1014.73	76.06
3/21/02 19:47	1014.73	76.06
3/21/02 19:48	1014.74	76.06
3/21/02 19:49	1014.73	76.07
3/21/02 19:50	1014.73	76.07
3/21/02 19:52	1014.72	76.07
3/21/02 19:53	1014.72	76.06
3/21/02 19:54	1014.72	76.06
3/21/02 19:55	1014.72	76.06
3/21/02 19:56	1014.72	76.05
3/21/02 19:58	1014.73	76.05
3/21/02 19:59	1014.72	76.05

City of Pompano Beach

Injection Test

	DOWNHOLE	DOWNHOLE
Date Time	(psi)	Temp (F)
3/21/02 20:00	1014.72	76.05
3/21/02 20:01	1014.73	76.05
3/21/02 20:02	1014.7	76.05
3/21/02 20:04	1014.71	76.04
3/21/02 20:05	1014.7	76.03
3/21/02 20:06	1014.7	76.03
3/21/02 20:07	1014.71	76.02
3/21/02 20:08	1014.71	76.01
3/21/02 20:10	1014.72	76
3/21/02 20:11	1014.71	76
3/21/02 20:12	1014.72	76
3/21/02 20:13	1014.72	76
3/21/02 20:14	1014.72	76
3/21/02 20:16	1014.72	76
3/21/02 20:17	1014.71	75.99
3/21/02 20:18	1014.71	75.99
3/21/02 20:19	1014.71	75.99
3/21/02 20:20	1014.71	75.98
3/21/02 20:22	1014.73	75.98
3/21/02 20:23	1014.72	75.97
3/21/02 20:24	1014.71	75.97
3/21/02 20:25	1014.71	75.97
3/21/02 20:26	1014.71	75.96
3/21/02 20:28	1014.73	75.97
3/21/02 20:29	1014.73	75.97
3/21/02 20:30	1014.72	75.98
3/21/02 20:31	1014.72	75.98
3/21/02 20:32	1014.72	75.99
3/21/02 20:34	1014.71	75.98
3/21/02 20:35	1014.69	75.96
3/21/02 20:36	1014.7	75.94
3/21/02 20:37	1014.71	75.93
3/21/02 20:38	1014.71	75.91
3/21/02 20:40	1014.71	75.89
3/21/02 20:41	1014.72	75.89
3/21/02 20:42	1014.72	75.89
3/21/02 20:43	1014.72	75.89
3/21/02 20:44	1014.73	75.9
3/21/02 20:46	1014.73	75.9
3/21/02 20:47	1014.72	75.91
3/21/02 20:48	1014.72	75.92
3/21/02 20:49	1014.72	75.92
3/21/02 20:50	1014.71	75.93
3/21/02 20:52	1014.69	75.93
3/21/02 20:53	1014.7	75.92
3/21/02 20:54	1014.72	75.91
3/21/02 20:55	1014.73	75.9
3/21/02 20:56	1014.74	75.89
3/21/02 20:58	1014.71	75.88
3/21/02 20:59	1014.71	75.87
3/21/02 21:00	1014.72	75.87
3/21/02 21:01	1014.73	75.86
3/21/02 21:02	1014.72	75.86
3/21/02 21:04	1014.71	75.85
3/21/02 21:05	1014.72	75.85
3/21/02 21:06	1014.72	75.84
3/21/02 21:07	1014.72	75.84
3/21/02 21:08	1014.73	75.83
3/21/02 21:10	1014.73	75.83
3/21/02 21:11	1014.73	75.84
3/21/02 21:12	1014.73	75.84
3/21/02 21:13	1014.75	75.85
3/21/02 21:14	1014.74	75.85
3/21/02 21:16	1014.73	75.86
3/21/02 21:17	1014.72	75.86
3/21/02 21:18	1014.72	75.86
3/21/02 21:19	1014.71	75.86
3/21/02 21:20	1014.72	75.85
3/21/02 21:22	1014.71	75.85
3/21/02 21:23	1014.73	75.85
3/21/02 21:24	1014.72	75.84
3/21/02 21:25	1014.71	75.84
3/21/02 21:26	1014.73	75.84
3/21/02 21:28	1014.73	75.83
3/21/02 21:29	1014.73	75.82
3/21/02 21:30	1014.72	75.81
3/21/02 21:31	1014.72	75.81
3/21/02 21:32	1014.71	75.8
3/21/02 21:34	1014.72	75.79
3/21/02 21:35	1014.73	75.78
3/21/02 21:36	1014.7	75.77
3/21/02 21:37	1014.71	75.77
3/21/02 21:38	1014.72	75.76
3/21/02 21:40	1014.73	75.75
3/21/02 21:41	1014.73	75.75
3/21/02 21:42	1014.72	75.75
3/21/02 21:43	1014.75	75.74
3/21/02 21:44	1014.74	75.74
3/21/02 21:46	1014.74	75.74
3/21/02 21:47	1014.74	75.74
3/21/02 21:48	1014.73	75.74
3/21/02 21:49	1014.73	75.74
3/21/02 21:50	1014.74	75.74
3/21/02 21:52	1014.75	75.73
3/21/02 21:53	1014.75	75.72
3/21/02 21:54	1014.74	75.71
3/21/02 21:55	1014.75	75.7
3/21/02 21:56	1014.74	75.69
3/21/02 21:58	1014.74	75.68
3/21/02 21:59	1014.73	75.68
3/21/02 22:00	1014.75	75.67
3/21/02 22:01	1014.75	75.67
3/21/02 22:02	1014.75	75.66
3/21/02 22:04	1014.76	75.66
3/21/02 22:05	1014.76	75.65
3/21/02 22:06	1014.76	75.65
3/21/02 22:07	1014.75	75.64
3/21/02 22:08	1014.72	75.64
3/21/02 22:10	944.9	75.84
3/21/02 22:11	836.79	76.05
3/21/02 22:12	724.09	76.26
3/21/02 22:13	609.52	76.47
3/21/02 22:14	494.71	76.68
3/21/02 22:16	262.02	77.52
3/21/02 22:17	144.64	78.14
3/21/02 22:18	52.17	78.77
3/21/02 22:19	33.62	79.39
3/21/02 22:20	23.63	80.02

Transducer Calibration Report
City of Pompano Beach Injection Test

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at **www.in-situ.com**!

Report Number: 2001101614000306

Calibration Result: **PASSED**

Calibration Date:	2001-10-16
Model:	PXD-261
Full Scale Pressure Range:	689.5 kPa (100 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	306

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 4.53 C to 29.38 C

Range of Applied Pressures: -0.1172 kPa (-0.0170 PSI) to 689.4771 kPa (100.0002 PSI)

Calibration Coefficients:

Linearity	0.1327
Scale	100.1588
Offset	-0.0292

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	-0.1172 kPa (-0.0170 PSI)	4.004	**PASSED**
Full Scale Response	689.4771 kPa (100.0002 PSI)	19.958	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.091	0.085	**PASSED**
Repeatability at 15 C (%FS)	-0.008	0.012	**PASSED**

Hysteresis (%FS)	0.020	**PASSED**
Thermal Hysteresis (%FS)	0.006	**PASSED**

Test Performed By: **JMD** Test Verified By:

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at **www.in-situ.com**!

Report Number: 2001090502005604

Calibration Result: **PASSED**

Calibration Date:	2001-09-05
Model:	PXD-261
Full Scale Pressure Range:	689.5 kPa (100 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	5604

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 5.11 C to 29.89 C

Range of Applied Pressures: 0.0552 kPa (0.0080 PSI) to 689.4812 kPa (100.0008 PSI)

Calibration Coefficients:

Linearity	0.3515
Scale	99.7492
Offset	0.1600

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	0.0552 kPa (0.0080 PSI)	3.976	**PASSED**
Full Scale Response	689.4812 kPa (100.0008 PSI)	19.958	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.082	0.096	**PASSED**
Repeatability at 15 C (%FS)	-0.004	0.010	**PASSED**

Hysteresis (%FS)	0.010	**PASSED**
Thermal Hysteresis (%FS)	0.015	**PASSED**

Test Performed By: DJK Test Verified By:

Document Version 1.00

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at www.in-situ.com!

Report Number: 2001120220005323 **Calibration Result:** **PASSED**

Calibration Date:	2001-12-02
Model:	PXD-261
Full Scale Pressure Range:	137.9 kPa (20 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	5323

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 4.88 C to 29.89 C

Range of Applied Pressures: 0.0097 kPa (0.0014 PSI) to 137.8958 kPa (20.0001 PSI)

Calibration Coefficients:

Linearity	0.1299
Scale	19.7035
Offset	-0.0407

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	0.0097 kPa (0.0014 PSI)	4.035	**PASSED**
Full Scale Response	137.8958 kPa (20.0001 PSI)	20.166	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.135	0.027	**PASSED**
Repeatability at 15 C (%FS)	-0.006	0.006	**PASSED**

Hysteresis (%FS)	0.010	**PASSED**
Thermal Hysteresis (%FS)	0.008	**PASSED**

Test Performed By: JMD Test Verified By:

Document Version 1.00

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at **www.in-situ.com**!

Report Number: 2001120220000472 **Calibration Result:** **PASSED**

Calibration Date:	2001-12-02
Model:	PXD-261
Full Scale Pressure Range:	137.9 kPa (20 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	472

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 4.88 C to 29.89 C
Range of Applied Pressures: 0.0097 kPa (0.0014 PSI) to 137.8958 kPa (20.0001 PSI)

Calibration Coefficients:

Linearity	0.0957
Scale	19.8250
Offset	-0.1433

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	0.0097 kPa (0.0014 PSI)	4.117	**PASSED**
Full Scale Response	137.8958 kPa (20.0001 PSI)	20.178	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.160	-0.033	**PASSED**
Repeatability at 15 C (%FS)	-0.007	0.007	**PASSED**

Hysteresis (%FS)	0.012	**PASSED**
Thermal Hysteresis (%FS)	0.014	**PASSED**

Test Performed By: **JMD** Test Verified By:

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at www.in-situ.com!

Report Number: 2001092122005076

Calibration Result: PASSED

Calibration Date:	2001-09-21
Model:	PXD-261
Full Scale Pressure Range:	137.9 kPa (20 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	5076

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 4.99 C to 29.84 C

Range of Applied Pressures: 0.3378 kPa (0.0490 PSI) to 137.8993 kPa (20.0006 PSI)

Calibration Coefficients:

Linearity	0.1150
Scale	19.9247
Offset	-0.0785

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	0.3378 kPa (0.0490 PSI)	4.102	**PASSED**
Full Scale Response	137.8993 kPa (20.0006 PSI)	20.031	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.081	0.092	**PASSED**
Repeatability at 15 C (%FS)	-0.006	0.010	**PASSED**

Hysteresis (%FS)	0.014	**PASSED**
Thermal Hysteresis (%FS)	0.028	**PASSED**

Test Performed By: **JMD** Test Verified By:

Document Version 1.00

Transducer

In-Situ Inc.

Calibration Report

210 S. Third Street, Laramie, Wyoming 82070 U.S.A. (TEL) 1-800-446-7488, 307-742-8213 (FAX) 307-721-7598
Visit us on the Internet at **www.in-situ.com**!

Report Number: 2001092122000462

Calibration Result: **PASSED**

Calibration Date:	2001-09-21
Model:	PXD-261
Full Scale Pressure Range:	137.9 kPa (20 PSI) Gauge
Manufacturer:	In-Situ
Serial Number:	462

Calibration Procedures and Equipment Used:

1. Automated software calibration procedures used

Range of Applied Temperatures: 4.99 C to 29.84 C

Range of Applied Pressures: 0.3378 kPa (0.0490 PSI) to 137.8993 kPa (20.0006 PSI)

Calibration Coefficients:

Linearity	0.1226
Scale	19.8711
Offset	0.0783

PASS/FAIL Criteria:

	Applied Pressure	Current mA	
Zero Response	0.3378 kPa (0.0490 PSI)	3.977	**PASSED**
Full Scale Response	137.8993 kPa (20.0006 PSI)	19.943	**PASSED**

	Minimum	Maximum	
Temperature Stability (%FS)	-0.135	0.026	**PASSED**
Repeatability at 15 C (%FS)	-0.008	0.008	**PASSED**

Hysteresis (%FS)	0.009	**PASSED**
Thermal Hysteresis (%FS)	0.019	**PASSED**

Test Performed By: **JMD** Test Verified By:

Document Version 1.00

WATER METER
ACCURACY TEST REPORT

9/24/01

#	MAKE	SERIAL NUMBER	LOW FLOW	INT. FLOW	HIGH FLOW
1	2"	USAGES			
2	USG	BEFORE			
3	MTRS	TEST			
4					
5		***SR# 2849837***	101.0	101.1	100.7
6	USAGES	1088700			
7					
8		***SR # 2738503***	99.1	99.8	99.5
9	USAGES	259200			
10					
11	USAGES	***SR # 2363373***	100.0	105.5	107.0
12		956000			
13			***5 GPM***	***8 GPM***	***65 GPM***
14					
15		USAGES			
16		AFTER			
17		TESTED			
18					
19		***SR# 2849837***			
20		1089100			
21					
22		***SR #2738503***			
23		260100			
24					
25		***SR # 2363373***	100.7	100.6	99.6
26		957500			
27			***5 GPM***	***8 GPM***	***65 GPM***
28					
29					
30					
31					
32					
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43					
44					
45					
46					
47					
48					

MASTER METER

1001 McKesson Dr.
Longview, TX 75604
(903) 297-0635
(800) 765-6518
FAX (903) 297-5963
RMA # 5007

CUSTOMER: YOUNGQUIST BROS INC.
TEST DATE: 9/24/01
TESTER: STEVE WHITE

NOTE:
Accuracy limits according to AWWA C708-96

*** 97% - 103% for Low Flows**

*** 98.5% - 101.5% for Intermediate and High Flows**

***Accuracy limits for meters removed from service according to M-6 Manual Table 5-1**

***80% - 104.0% for Low Flows**

***96% - 102.0% for Intermediate and High Flows**

WATER SPECIALTIES ®

METER TEST RECORD

963052-Z
SERIAL NUMBER
2/7/2002
DATE

SOLD TO OZONE INDUSTRIES CORP.

SHIP TO YOUNGQUIST BROS.

FINAL TOTALIZER READING

WE CERTIFY THAT THE TEST RESULTS SHOWN IN THIS REPORT ARE CORRECT TO THE BEST OF OUR KNOWLEDGE AND BELIEF. OUR TEST FACILITY IS CERTIFIED REGULARLY TO AN ACCURACY OF 0.2% AND IS TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY.

WATER SPECIALTIES

BY:

FLOW RATE G.P.M.	TESTED ACCURACY			FLOW RATE G.P.M	NEW ACCURACY		
	% ACCURACY	GEARS	INDEX		% ACCURACY	GEARS	INDEX
2992.2	99.81	39J/24D	.8487				
1531.4	99.31	"	"				
338.4	98.1	"	"				

TESTED AVERAGE ______ TESTED INDEX

DESIRED AVERAGE ______ NEW INDEX

SPEC. PIPE I.D. ______

STD. PIPE I.D. ______

$$\left(\left(\frac{\text{SPEC. I.D.}^2 \_\_\_ - 4.285}{\text{STD. I.D.}^2 - 4.285 \_\_\_}\right) * \text{STD. INDEX} \_\_\_\right) = \text{NEW INDEX} \_\_\_$$

CUSTOMER PIPE SIZE ______ O.D. 12.200 I.D. ______ % AS GEARED

	SPECIFICATION	INDEX
METER SIZE/MODEL NO.	12" MODEL ML-03	
TOTALIZER DIAL	1000 GALLONS	
INDICATOR DIAL TOTALIZER GEARING	256/1	

METER CHANGE GEARS

A/B = SEE ABOVE

GEAR RATIO

PROP. SIZE ______ TYPE ______ BEARINGS ______

ACCESSORIES ______

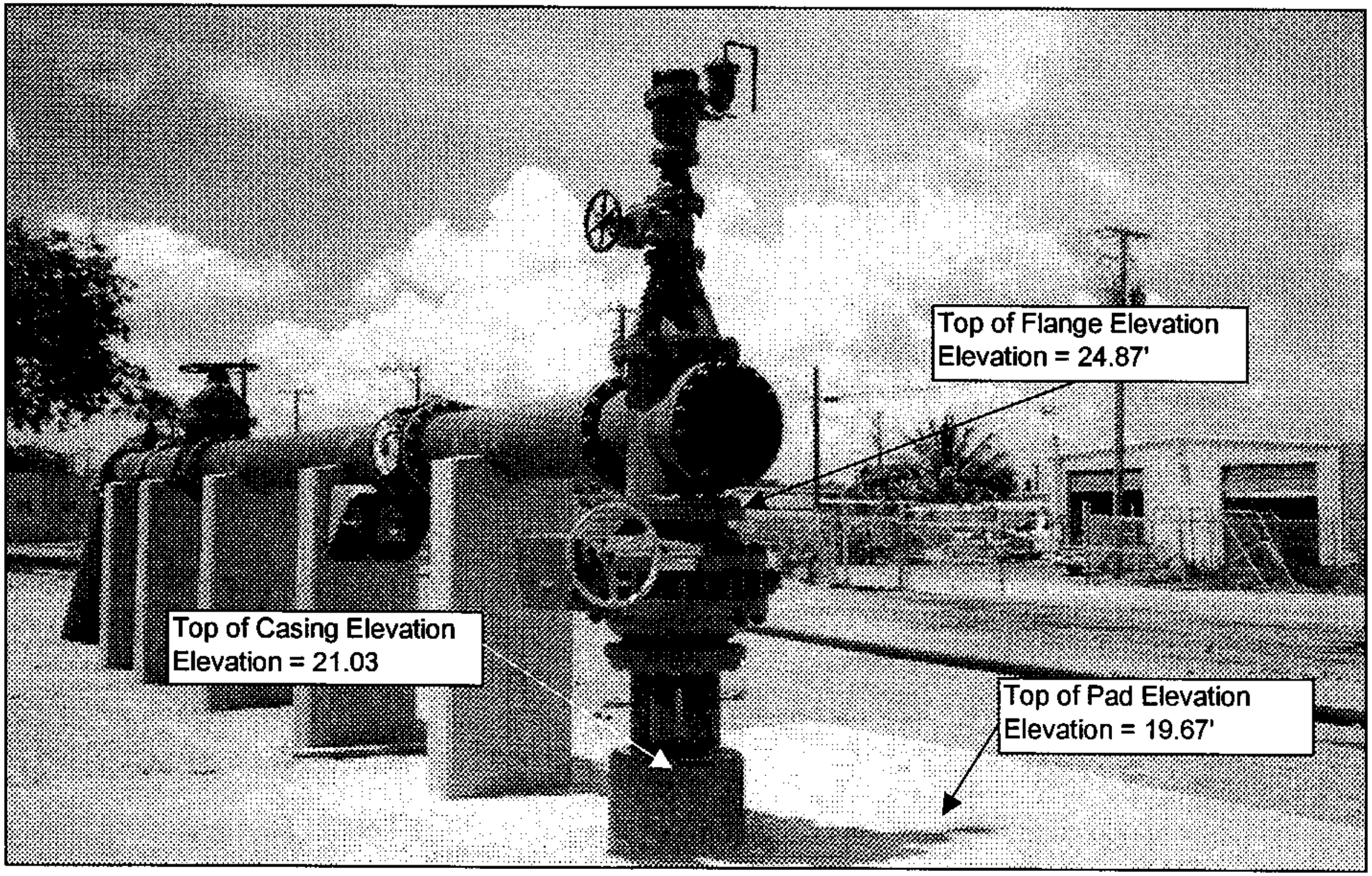
BUILT BY ______ DATE BUILT ______

INV. DATE ______ INV. NO. ______ CKD. BY ______

FORM 111-G-1200

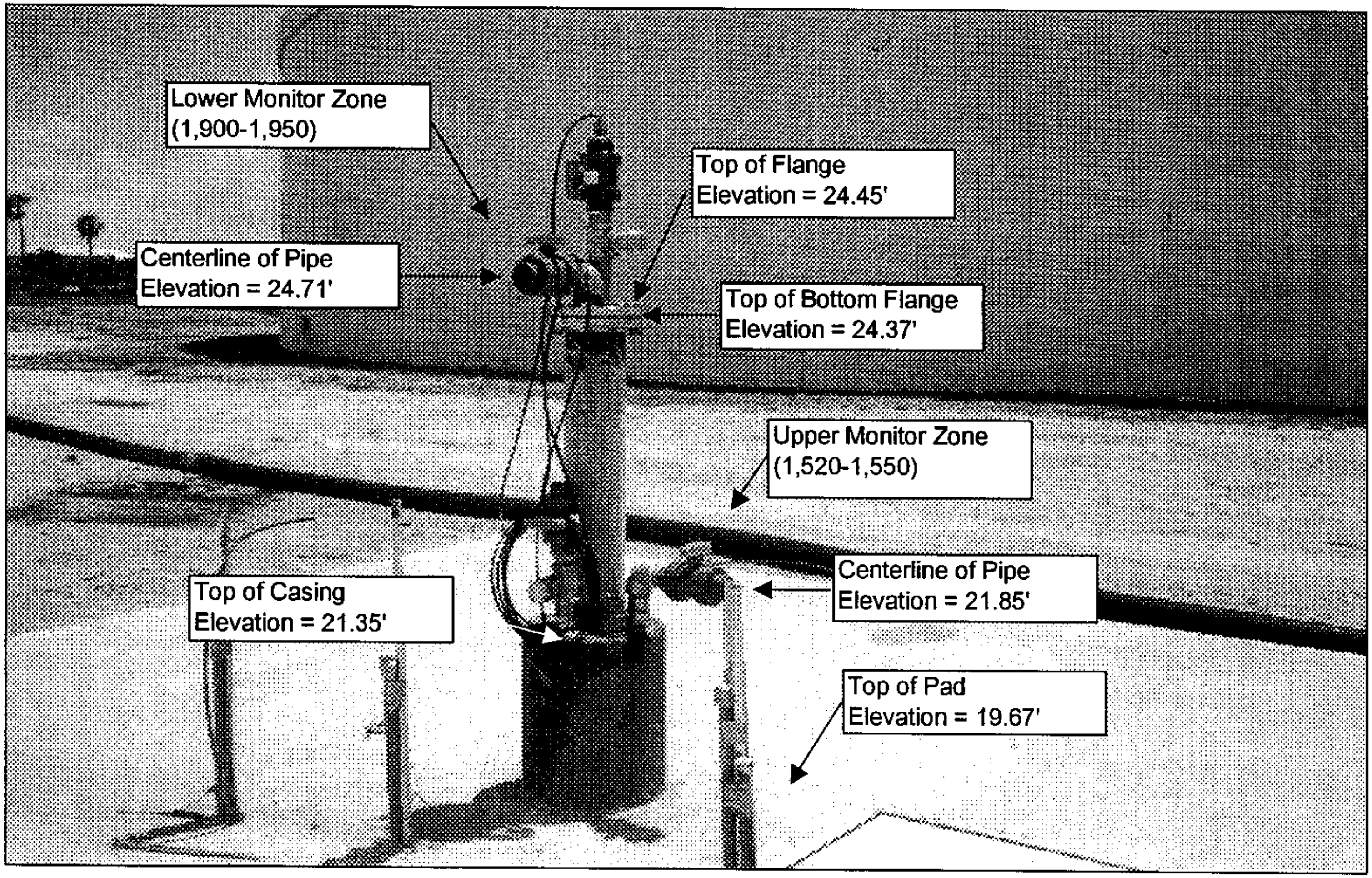
City of Pompano Beach
Concentrate Disposal System
Project No. 40368

Concentrate Disposal Well (IW-1)



City of Pompano Beach
Concentrate Disposal System
Project No. 40368

Concentrate Disposal Well (MW-1 Upper and Lower Zones)



SURVEY PLAT

OF INJECTION WELLS
LOCATED IN
BROWARD COUNTY, FLORIDA

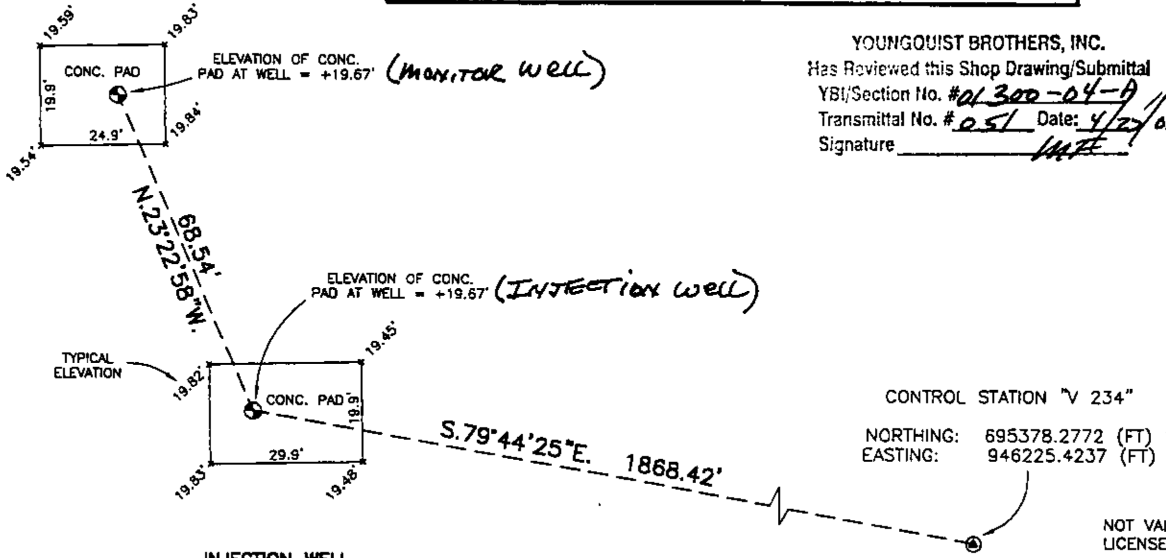
THE COORDINATES SHOWN HEREON WERE BASED ON GPS REAL-TIME TIES TO "V 234" CONTROL STATION.

DESIGNATION – V 234
PID – AD2599
STATE/COUNTY – FL/BROWARD
USGS QUAD – POMPANO BEACH (1983)
NAD 83/90 GEOGRAPHIC COORDINATE – N 26°14'38.52405" W 080°06'54.25868"
NAD 83/90 STATE PLANE COORDINATE – FLORIDA EAST ZONE
NORTHING: 211,951.723 (MT)
EASTING: 288,410.086 (MT)

INJECTION WELL

NORTHING:	**695773.97 (FT)**
EASTING:	**944359.68 (FT)**
LATITUDE:	**N 26°14'42.569"**
LONGITUDE:	**W 80°07'14.719"**

YOUNGQUIST BROTHERS, INC.
Has Reviewed this Shop Drawing/Submittal
YBI/Section No. #01 300-04-A
Transmittal No. #051 Date: 4/23/02
Signature IMF



INJECTION WELL

NORTHING:	**695711.07 (FT)**
EASTING:	**944386.88 (FT)**
LATITUDE:	**N 26°14'41.944"**
LONGITUDE:	**W 80°07'14.425"**

N

LEGEND:

FT.= FEET
MT.= METERS
CONC.= CONCRETE

PREPARED FOR:

YOUNGQUIST BROTHERS, INC.

NOTES:

THIS PLAT PREPARED AS A SPECIFIC PURPOSE SURVEY FOR THE PURPOSE OF LOCATING THE INJECTION WELLS AND CONCRETE PADS WITH ELEVATIONS.

BEARINGS AND COORDINATES SHOWN HEREON ARE STATE PLANE FOR THE FLORIDA EAST ZONE NAD 83/1990 ADJUSTMENT AND BASED ON GPS REAL-TIME TIES TO CONTROL STATION "V 234".

ELEVATIONS SHOWN HEREON ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), FROM TIES TO CONTROL STATION "V 234" ELEVATION = +18.04'.

UNDERGROUND IMPROVEMENTS, UTILITIES AND/OR FOUNDATIONS WERE NOT LOCATED UNLESS OTHERWISE NOTED.

DATE OF LAST FIELD WORK: 4-17-2002

FOR THE FIRM:

Scott M. Shore

SCOTT M. SHORE
PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA CERTIFICATE NO. LS# 5743
DATE SIGNED: 4-22-2002

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

TITLE: SPECIFIC PURPOSE SURVEY

MERIDIAN
SURVEYING & MAPPING, LLC
LAND SURVEYORS PLANNERS
LB# 7071

5245 RAMSEY WAY, SUITE #2
FORT MYERS, FLORIDA 33907
PHONE: (941) 275-8575
FAX: (941) 275-8457

www.meridianfl.com

FILE NAME:	FIELD BOOK/PAGE:	PROJECT NO.:	SHEET:
2784SR.DWG	54/02	2784	1 OF 1

SURVEY DATE:	DRAWN BY:	SCALE:	CHECKED BY:	FILE NO. (S-T-R)
4-17-2002	SMS	1"= 30'	TLM/SMS