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Miami-Dade Water and Sewer Department

Rehabilitation of Production Well No. 10 at the Northwest Wellfield

Final Report

May 1999

MONTGOMERY WATSON

MONTGOMERY WATSON

May 4, 1999

Mr. Jorge Rodriguez
Deputy Director, Water
Miami-Dade Water and Sewer Department
4200 Salzedo Street
Miami, Florida 33146

SUBJECT: Northwest Wellfield Supply Well No. 10
Well Rehabilitation Report

Dear Mr. Rodriguez:

Montgomery Watson is pleased to submit this final report documenting the recently completed rehabilitation of Well No. 10 at the Northwest Wellfield. The report contains descriptions of the methods and materials that were utilized during the well rehabilitation and testing. The report also includes the results of the Microscopic Particulate Analysis that were performed on water collected from the well during late 1998 and early 1999.

This report can be submitted to the GWUDI staff of Florida Department of Environmental Protection in Tallahassee in support of the Agreement, as a successful demonstration of well rehabilitation technology.

It has been a pleasure working with the Miami Dade Water and Sewer Department on this project. If you have any questions or comments, please do not hesitate to call.

Very truly yours,

MONTGOMERY WATSON

Robert T. Verrastro, P.G.
Senior Hydrogeologist

cc: Vincent Flick, Miami-Dade Water and Sewer Department
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ACKNOWLEDGEMENTS

The successful completion of this project was the result of the hard work and cooperation between many individuals and organizations involved in the design, permitting and rehabilitation of Well No. 10. Those who played significant roles in this achievement were:

Miami-Dade Water and Sewer Department
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Miami-Dade Water and Sewer Department

Rehabilitation of Production Well No. 10 at the Northwest Wellfield

Submitted by
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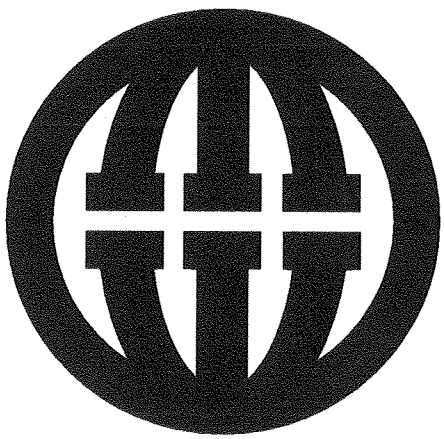

May 1999

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Executive Summary

Production Well No. 10 at the Miami-Dade Water and Sewer Department's (MDWASD's) Northwest Wellfield underwent construction rehabilitation during early 1998. This project was performed in response to regulatory concerns that the well may have been producing groundwater that was under the direct influence of surface water.

In 1995 and 1996, the Florida Department of Environmental Protection (FDEP) performed a screening sampling of water produced from the production wells within the Northwest Wellfield. This sampling was conducted during a state-wide evaluation of community water supply systems, as required by the Safe Drinking Water Act. In January 1997, the MDWASD received notification from the FDEP that Well No. 10 in the Northwest Wellfield had received Microscopic Particulate Analysis (MPA) score results that designated that well as producing groundwater under the direct influence of surface water.

Subsequent tests performed on Well No. 10 by MDWASD and Montgomery Watson during a 1997 wellhead investigation indicated that a possible "short-circuit" of flow around the outside of the casing may have been the cause of particulate matter contained in water produced from the well. These results were summarized in a report entitled "Independent Evaluation of GWUDI for Northwest wellfield Well No. 10", filed with the FDEP in October 1997. Following submission of that report, the MDWASD and FDEP entered into a formal "Agreement" to rehabilitate Well No. 10 and implement corrective actions on any other well within the MDWASD system that was determined to be Groundwater Under The Direct Influence of Surface Water (GWUDI). As a result, Well No. 10 has undergone a construction rehabilitation.

The highlights of the rehabilitation performed on Well No. 10 are as follows:

- The existing 48-inch diameter casing was pressure grouted with superplasticized Class "H" cement.

- A new 40-inch diameter steel casing was installed inside the existing 48" casing and extends from land surface to 64 feet below land surface (bls).

- A 38-inch diameter pilot hole was then drilled to 120 feet bls. Activities performed within the pilot hole included drilling, pumping and air-lift development, backfilling and acidizing.

- The open-hole of the well now extends from 64 feet bls to a total depth of 106 feet bls, and is completed in a gray-colored, sandy limestone representing the Tamiami Formation.

- The rehabilitated well now yields water at a specific capacity of in excess of 500 gallons per minute per foot of drawdown (gpm/ft) when pumped at rates of between 1,000 gpm and 3,000 gpm. The well exhibits a specific capacity of less than 300 gpm/ft when pumped at rates of between 3,000 gpm and 5,000 gpm.

- When pumped at a rate of 6,600 gallons per minute, approximately 27 feet of drawdown is induced in the well (the water level in the well was measured at 38 feet bls.

- Water produced from Well No 10 now exhibits a color of 90 PCUs, a chloride concentration of 63 milligrams per liter, a pH of 7.3 units, and an total hardness of 270 parts per million.

- The results of MPA tests performed during the post-rehabilitation monitoring of Well No. 10 indicate successful rehabilitation and satisfy the requirements set forth by the FDEP for reconsideration of the designation of Well No. 10 as GWUDI.

Section 1

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Section 1
Introduction

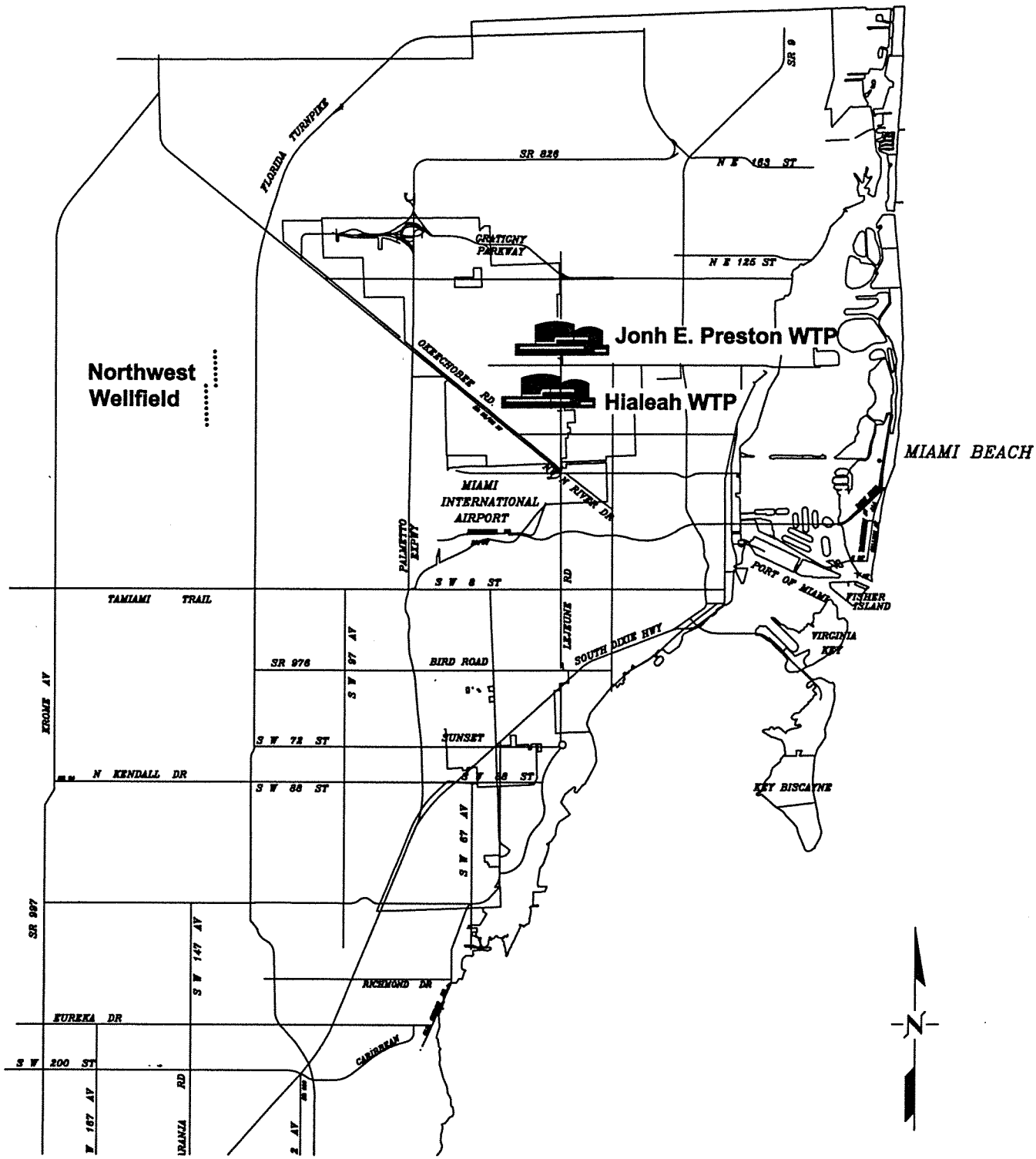
The Miami-Dade Water and Sewer Department's (MDWASD's) Northwest Wellfield consists of fifteen supply wells which provide raw water primarily to the John E. Preston Water Treatment Plant. The Northwest Wellfield is located approximately one mile west of the Florida Turnpike, at the western terminus of N.W. 58 Street. **Figure 1-1** presents a Site Location Map. Each of the supply wells at the Northwest Wellfield is equipped with a 32-inch diameter dual-speed pump rated at design capacity of 10 million gallons of water per day (mgd) and 15 mgd. The total installed withdrawal capacity for the wellfield is 225 mgd. The average day permitted capacity of the Northwest Wellfield is currently 165 million gallons (equivalent to 60.23 billion gallons per year) from the surficial aquifer system (155 mgd) and an aquifer storage recovery system (10 mgd), as contained in MDWASD's consumptive water use permit (No. 13-00037-W).

Water collected from the wells within the Northwest Wellfield was sampled and analyzed by the Microscopic Particulate Analysis (MPA) method by the Florida Department of Environmental Protection (FDEP) between 1995 and 1996. This sampling was conducted by the FDEP during a state-wide evaluation of community water supply systems, as required by the Safe Drinking Water Act. The results of the sampling indicated that water collected from Well No. 10 contained concentrations of microscopic particulate matter that yielded FDEP "Relative Risk Factors" of 15 and 16. During October, 1996 MDWASD collected and analyzed a water sample from the well that yielded an MPA result of 23.

In January 1997, the MDWASD received notification from the FDEP that Well No. 10 in the Northwest Wellfield had received MPA score results that designated the well as producing groundwater under the direct influence of surface water. As a result of the analyses, MDWASD initiated several independent investigations into the significance and the potential cause of surface water entering Well No. 10.

Tests performed on Well No. 10 during a 1997 wellhead investigation conducted by the MDWASD and Montgomery Watson indicated that a possible "short-circuit" of flow around the outside of the casing may have been the cause of particulate matter contained in water collected from Well No. 10. The 48-inch diameter well casing extended from land surface to 40 feet below land surface (bls). The methods and results of that investigation are presented in a report prepared by Montgomery Watson entitled "Independent Evaluation of GWUDI for Northwest Wellfield Well No. 10" (dated October 23, 1997 and on file at the FDEP in Tallahassee).

As a result of the wellhead investigation, Montgomery Watson was requested to perform an evaluation of alternatives for rehabilitating Well No. 10, to eliminate the potential short circuit around the outside of the casing. After consideration of the technical feasibility, risks and costs associated with a variety of alternatives, it was decided that Well No. 10 would be rehabilitated by performance of a pressure grout of the existing well casing, followed by installation of a new casing (liner) installed deeper within the Biscayne Aquifer. Copies of the permits obtained by MDWASD from the South Florida Water Management District and the Florida Department of Health to perform the construction rehabilitation are contained in **Appendix A.**



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Site Location Map

Figure 1-1

This report presents the sequence of the rehabilitation, including the methods and materials used during the work. Tests conducted throughout the rehabilitation are also presented, along with an interpretation of the results. This report also includes new geophysical and hydrogeologic findings that have resulted from performance of this work.

Section 2

Section 2
Original Wellfield Construction and Testing

The fifteen (15) supply wells comprising the Northwest Wellfield were built in 1981 by the Alsay-Pippin Corporation of Lake Worth, Florida. **Table 2-1** presents "Table A" from MDWASD's consumptive use permit, which contains a description of the supply wells. A typical as-built construction diagram of a supply well at the Northwest Wellfield is presented on **Figure 2-1.** The supply wells were drilled by the mud-rotary method, where drilling mud is circulated (pumped) down through a hollow drill pipe and out, into the borehole through nozzles in a rotary drilling bit. The drilled rock cuttings and mud then flow up, around the outside of the drill bit and pipe to the surface, where the mud is then filtered and re-pumped back down the drill pipe. The mud-rotary drilling method is a conventional drilling method in southern Florida, and is particularly useful in obtaining accurate samples of the geologic formations penetrated during drilling.

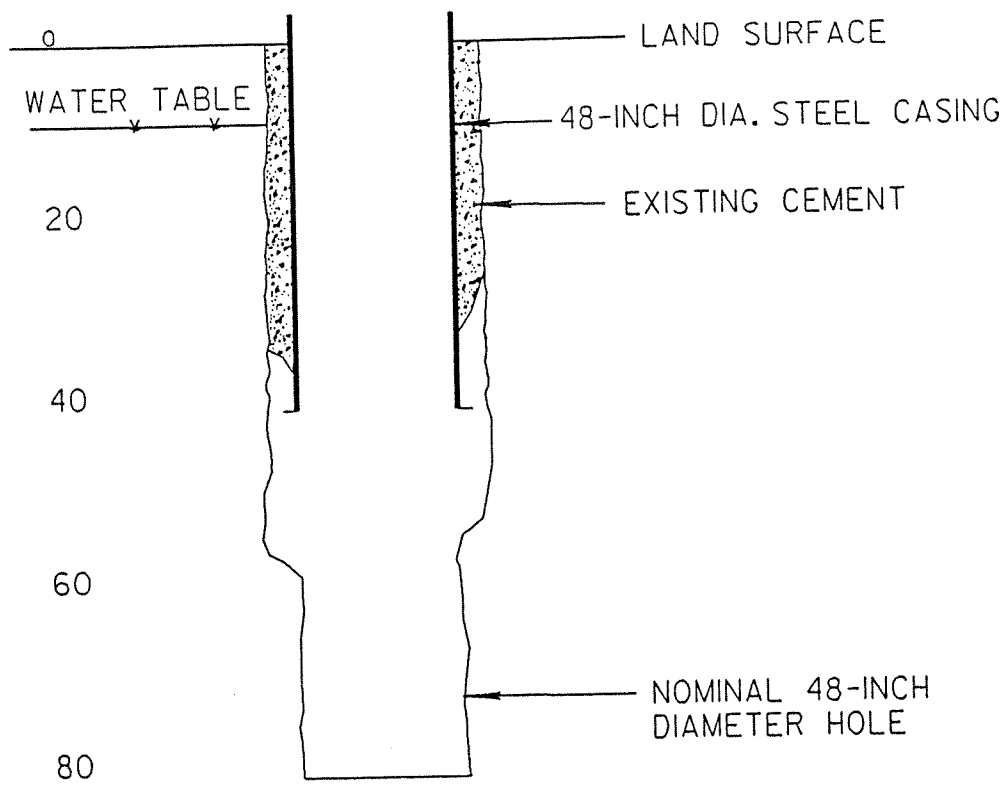
Table 2-1

Table A – Description of Wells
Northwest Wellfield

Well No.	1 thru 7	8 thru 15
Map designation B-2(d)	1 thru 7	8 thru 15
Existing/Proposed	Exist	Exist
Diameter (inches)	48 inches	48 inches
Total Depth	80 feet	80 feet
Cased Depth	46 feet	46 feet
Screened Interval	N/A	N/A
Pumped or Flowing	Pumped	pumped
Working Value. If Artesian (Yes/No)	N/A	N/A
Pump Manufacturer and Model No.	Byron Jackson Model 32 RXL	Byron Jackson Model 32 RXL
Pump (Centrifugal, Type Jet, Deep Jet, Turbine, etc.)	Vertical turbine	Vertical turbine
Intake Depth (NGVD)	40 feet	40 feet
Pump Capacity (GPM at __ ft of head at __ PSI)	7600 gpm @ 104 feet	7600 gpm @ 104 feet
Active (Yes/No)	Yes	Yes
Year Drilled	1981	1981
Type of Meter	*	*
Florida Plane Coordinates	SEC 14 TWP 53 RGE 39	SEC 11 TWP 53 RGE 39

* No individual meters at wells, venturi meters at plant influent

EXISTING WELL CONFIGURATION



A nominal 54-inch diameter borehole was drilled to a depth of approximately 45 feet bls at each of the supply wells at the Northwest Wellfield. Numerous "lost circulation" zones were encountered within the Biscayne aquifer during the drilling of these boreholes. Lost circulation is a condition whereby the formation is so porous and permeable that the drilling mud fills voids in the formation and there is insufficient mud volume in the circulation system for the fluid to be pumped back to surface. In response to this condition, it is typical for the drilling contractor to add significant quantities of additional mud and/or other additives to increase the viscosity (thicken) the drilling fluid, in order to regain circulation.

Casing Setting and Cementing

Steel casings (48-inch diameter) were installed to depths of between 40 to 45 feet bls. The casings were then held suspended in tension within the mud-filled hole, and cemented by the "pressure grouting" technique. Pressure grouting involves lowering an open-ended tremie pipe to near the base of the casing to be cemented. The tremie pipe is then affixed and sealed to the top of the casing by a "pressure header" coupling. Cement is then pumped down the tremie pipe, and forced into the annular space between the casing and the drilled hole. The fluid column between the outside of the tremie pipe and the inside of the casing remains sealed during this process by the pressure header, and prevents the cement from filling the inside of the casing. The cement is pumped this way under pressure, from "bottom to top" until it reaches land surface.

Typically, the cement will fill the annulus around the casing and the drilled hole, resulting in a complete seal around the casing as the cement rises to the surface. For this reason, the pressure grouting technique is a conventional method of cementing in southern Florida. However, when the drilling mud within the hole has been thickened extensively, there is a potential for the pumped cement to rise as "fingers", resulting in uncemented channels behind the casing. These uncemented zones could ultimately create a connection (short-circuit) between surface water and the borehole of the supply well.

Open Hole Completion

After the cement behind the casing is allowed to harden, the contractor proceeds to drill out the open holes. At first, the bit is lowered to near the bottom of the casing and the cement "plug" is drilled out. The process of drilling the plug should be done slowly and carefully, so as to prevent the bit from "clanking" violently against the inside bottom of the well casing. If care is not taken during this process, the cement around the outside of the well casing could be broken off, resulting in an incomplete cement seal near the base of the casing. This condition could create a potential short-circuit that might exist in the annular space around the well casing. The original open hole of Well No. 10 was drilled with a 32-inch diameter bit to a depth of about 80 feet below land surface.

Original Pump Testing at the Northwest Wellfield

After drilling of the open hole was completed, each of the supply wells was subjected to development and testing by pumping. The wells comprising the Northwest Wellfield are

completed in the highly transmissive Biscayne aquifer. As a result, the wells are capable of producing several thousands of gallons of water per minute (gpm) with relatively small drawdown (measured as feet of decline in the water surface within the pumped well). **Table 2-2** presents a concise summary of the step-rate pumping test results at each of the supply wells in the Northwest Wellfield during September 1981.

Table 2-2
Original Step-Rate Pumping Test Summary at the Northwest Wellfield

Well No.	Pumping Rate (gpm)	Drawdown (ft)	Specific Capacity (gpm/ft)
1	7,000	1.7	4,120
2	7,000	2.9	2,410
3	7,000	3.3	2,120
4	7,000	2.6	2,690
5	7,000	2.4	2,920
6	7,000	1.3	5,380
7	7,000	1.8	3,890
8	7,000	2.0	3,500
9	7,000	1.9	3,680
10	7,000	6.8	1,030
11	7,000	3.5	2,000
12	7,000	1.6	4,370
14	7,000	14	500

Note: Wells No. 13 and No. 15 were not tested

1997 Wellhead Evaluation of Well No. 10

In response to regulatory concerns regarding the potential for surface water impacts on water produced from Well No. 10, MDWASD has undertaken various investigations. Tests were conducted to assess the integrity of the interior and exterior of the well casing and cement and the condition of the open hole. These tests are briefly described in the following text.

Video Survey

During January 1997, a video survey was conducted on Well No. 10 after the pump was removed. The water in the well was relatively free of suspended particles, providing excellent picture clarity. The interior of the casing above 20 feet bls appeared intact and in good condition, with a minor amount of scale (film) built up on the inside of the casing. At a depth of approximately 15 feet bls, an apparent offset casing joint was observed. This offset may have occurred during original welding or may have developed as the casing was subjected to the external pressure of the cement, as it was pressure grouted. This offset joint could have represented a "weak zone" in the casing integrity. Between the depths of 20 feet to 30 feet bls,

the casing appeared pitted and corroded, which may have been a result of galvanic corrosion associated with the submersible turbine pump column.

The base of the well casing was observed at a depth of 41 feet bls. The cement plug near the bottom of the well casing was noticeably absent. The open hole revealed a highly porous and fossiliferous limestone throughout most of it's length. A relatively dense, non-porous zone was observed between the depths of 58 feet to 60 feet bls. The base of the open hole was encountered at 80 feet bls, and appeared to be filled with chunks of rock, or possibly cement from the original cement plug.

Tapping Test

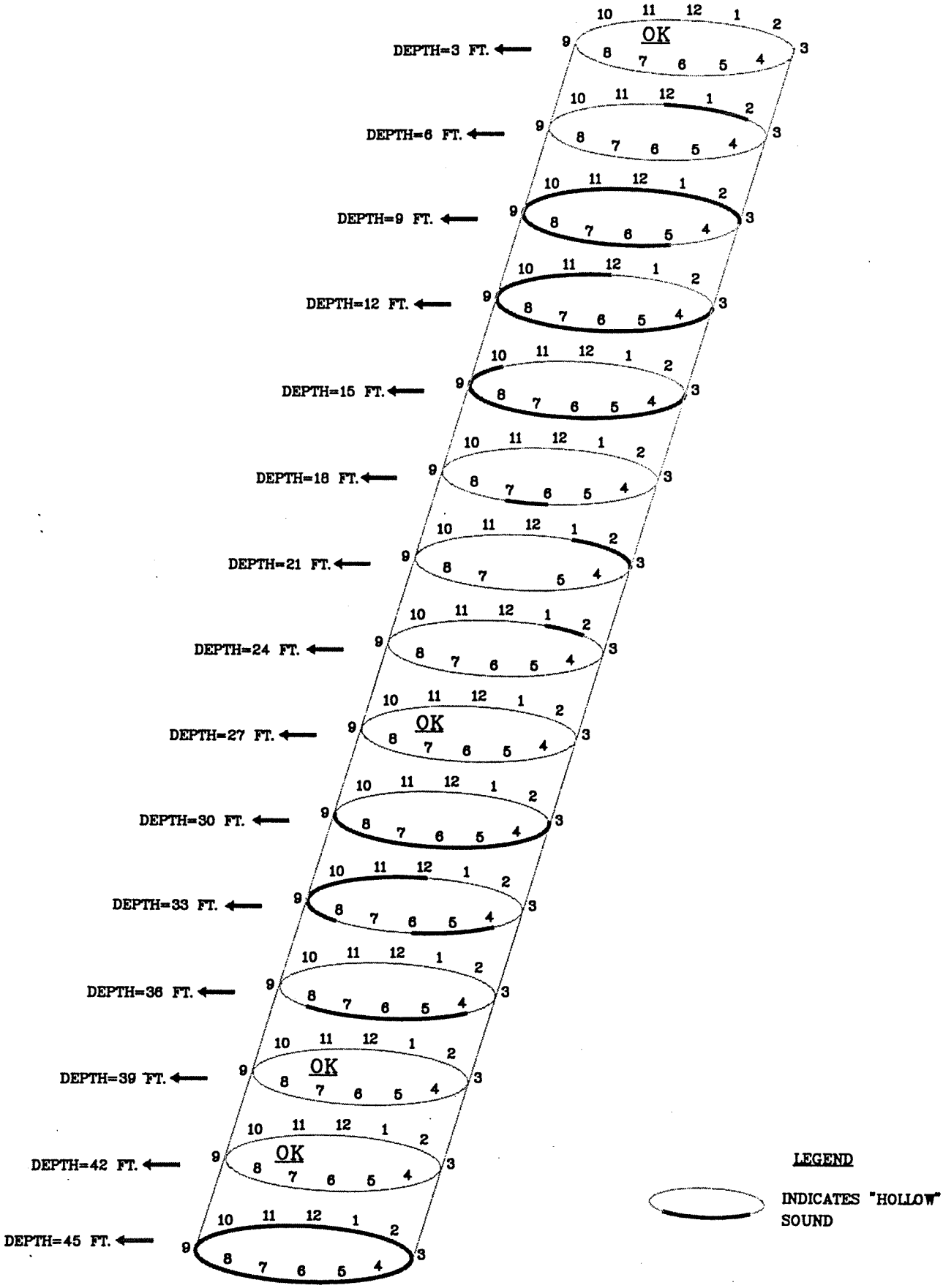
During April 1997, a diver was lowered into Well No. 10 and performed a "tapping test". This test was performed because a cement bond log was not able to be performed in such a large diameter well. For this test, a hammer was used to tap the circumference of the inside of the well casing at regular (3-foot) intervals. Evaluation of the soundings has been used to estimate the presence or absence of a cement bond behind the casing. **Figure 2-2** presents a visual summary of the tapping test results. The results of the test indicated that a "hollow" sound (implying the lack of a cement bond) was recorded along portions of the casing between depths of 6 feet to 24 feet bls and between 30 feet to 36 feet bls. These results indicated that although the casing was pressure grouted, the cement may have channeled along sections of the annulus. The diver observed that there was very little cement located near the base of the well casing, and was able to reach his arm up, around the outside of the 48-inch diameter pipe with no obstruction, further indicating lack of a cement within the annulus of the well casing.

As a result of these findings, it was determined that a pressure grouting operation should be performed on the existing well casing, to eliminate any potential short circuit of surface water entering the well from around the well casing.

Hydrostatic Pressure Test

During May 1997, an inflatable packer was set near the bottom of the casing of Well No. 10. The well then was hydrostatically pressurized to 51 pounds per square inch (psi) and readings were collected every 10 minutes. Over the first 20 minutes, the pressure declined 3 psi. Adjustments where made to the surface piping, to eliminate a visible leak at the surface. Over the next 40 minutes, the pressure continued to decline another 2 psi. This pressure decline was in excess of the 5% tolerance that is often applied during well mechanical integrity testing evaluations, although further testing utilizing this technique was not undertaken.

As a result of these findings, it was determined that a new 40-inch diameter well casing should be installed (cemented) within the existing casing of Well No. 10. Installation of the new casing (liner) would eliminate the potential for a leak within the existing casing to contribute surface water to the well and would permit recompletion of the final casing to within a deeper zone of the Biscayne Aquifer.



MONTGOMERY WATSON	Tapping Test Results	Figure 2-2

Section 3

Section 3
Hydrogeology

Regional Geologic Setting

Northwestern Dade County is underlain by geologic units consisting of limestone and sand exhibiting varying permeability from land surface to approximately 160 feet bls. The geologic formations most typically present within this section are the Miami Oolite, the Fort Thompson Formation, and the Tamiami Formation. **Figure 3-1** presents a regional stratigraphic cross section of the surficial sediments and geologic formations in the Northwest Wellfield area. These units form the surficial aquifer system, which is the source of most of the potable water in the area (Fish, 1991). The Miami Oolite forms the top of the surficial aquifer system, and is typically between 10 to 15 feet thick, with a hydraulic conductivity of greater than 1,000 feet per day (ft/day). Lying below the Miami Oolite is the Fort Thompson Formation, which is typically a cream to white-colored fossiliferous shelly limestone. The Fort Thompson Formation is approximately 60 feet thick in the Northwest Wellfield area and contains numerous solution-enhanced vuggy porosity features. This formation typically exhibits hydraulic conductivities of up to 10,000 ft/day in the Northwest Wellfield area. Lying below the Fort Thompson Formation is the Tamiami Formation, which is described as gray-colored sandy limestone. The Tamiami Formation is approximately 70 feet thick in the Northwest Wellfield area, exhibits hydraulic conductivities of up to 1,000 ft/day.

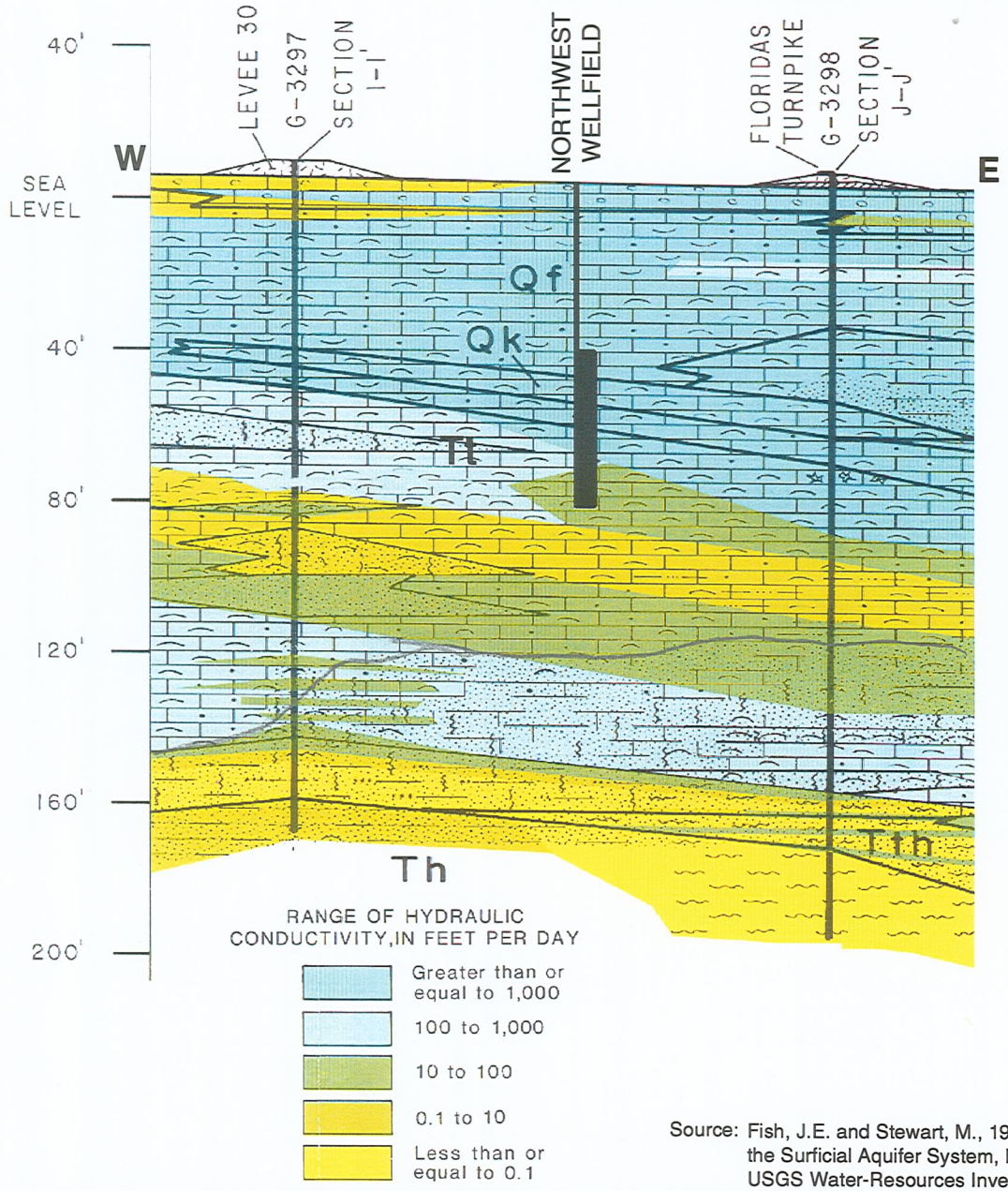
The surficial aquifer is an unconfined aquifer, recharged by rain water and surface-water features such as canals, wetlands and lakes. Contained within the surficial aquifer system (typically within the Fort Thompson Formation) is a highly permeable unit referred to as the Biscayne aquifer, in which most public supply wellfields in southeastern Florida are completed. Lying below the surficial aquifer system are lower permeability clay-rich sediments of the Hawthorn Formation.

Wellfield Stratigraphy

Figure 3-2 presents a hydrostratigraphic cross section developed from the original lithologic and construction descriptions from the wells within the Northwest Wellfield. The figure reveals that a horizon of white to tan-colored limestone extends from near land surface to a depth of approximately 50 feet bls in the southern portion of the wellfield. This horizon is identified as the Fort Thompson Formation. This formation thickens to approximately 70 feet as one traverses from the southern portion of the wellfield to the northern portion of the wellfield. Numerous lost circulation zones were documented in the driller's logs of this formation, which contains the water-bearing zones of the Biscayne Aquifer. The transmissivity of this unit is approximately 1,300,000 ft squared per day within the wellfield, as estimated from the specific capacity data described in Section 2 of this report.

Below the upper Fort Thompson Formation, the limestones become gray-colored, and contain higher quantities of sand. The limestones were correlatable across the wellfield, and are herein identified as the Tamiami Formation. The top of this formation was encountered at a depth of approximately 60 feet bls in the southern portion of the wellfield. Within the northern portion of the wellfield, it was encountered at a depth of 80 feet bls.

Regional Stratigraphic Cross Section



Fill
Peat or muck
Sand
Sandstone
Detrital carbonate sand
Rock fragments
Concretions
Marine shells
Freshwater shells
Silt
Clay
Claystone or siltstone
Micrite, lime mud
Limestone
Oolitic limestone
Coralline limestone, biolithite

GEOLOGIC FORMATIONS

Ql Lake Flirt Marl
Qp Pamlico Sand
Qm Miami Oolite
Qa Anastasia Formation
Qk Key Largo Limestone
Qf Fort Thompson Formation
Tt Tamiami Formation
Th Hawthorn Formation
Tth Tamiami Formation and Hawthorn Formation undifferentiated

Formation boundary

G-3295
Test well and number

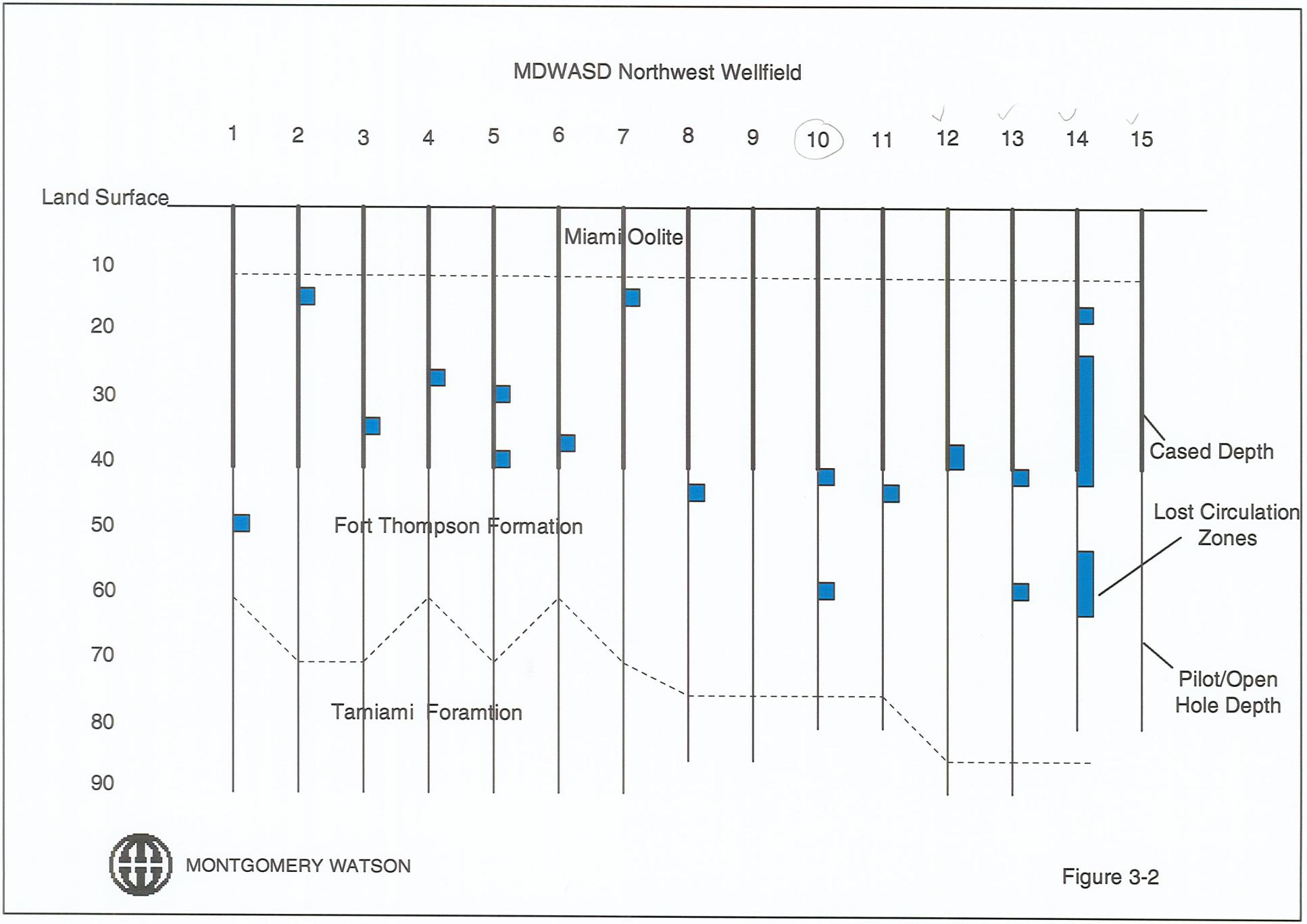
0 5 10 MILES
0 5 10 KILOMETERS

Vertical Scale Greatly Exaggerated

Well with Open Hole Completion

Source: Fish, J.E. and Stewart, M., 1991. Hydrology of the Surficial Aquifer System, Dade County, Florida. USGS Water-Resources Investigations Report 90-4108

Figure 3-1



MONTGOMERY WATSON

Figure 3-2

Well No. 10 Lithology

During the drilling, deepening and testing of Well No. 10 during this project, lithologic samples were collected and described. Copies of the lithologic descriptions are contained in **Appendix B.** The lithologic samples provided a detailed characterization of the geologic units present at the site. Cuttings collected from near the base of the 40-inch casing were comprised of white to cream-colored limestone to a depth of approximately 80 feet bls (representing the Fort Thompson Formation). Cuttings within the interval from 40 feet to approximately 60 feet bls exhibited very high porosity, in the form of large solution channels and vugs. Below the depth of 60 feet bls, the samples exhibited less macro-porosity and more "pinpoint" and intergranular-type porosity.

Below the depth of 80 feet bls, the limestone became dark gray-colored, and exhibited relatively low porosity. This formation was interpreted to represent the Tamiami Formation. Limestone was present to a depth of approximately 95 feet bls. Below this depth, the strata became loosely-consolidated, and was comprised primarily of shell fragments and fine sand. These sediments were very soft and penetrated easily during drilling. At a depth of approximately 115 feet bls, the sediments began to contain a significant percentage of dark gray-colored clay. At a depth of 120 feet bls, the sediments were comprised entirely of clay. This clay was interpreted as representing the uppermost sediments of the Hawthorn Formation. The entire penetrated thickness of the sediments comprising the surficial aquifer system at the Northwest Wellfield was therefore estimated at 115 feet.

Section 4

Section 4
Rehabilitation and Testing

In January 1998, Youngquist Brothers, Inc. (Youngquist), a Fort Myers based well contractor, mobilized to the site and constructed a rotating head assembly within the Well No. 10 wellhouse. On January 14, 1998, a caliper survey was performed along the entire length of the well casing and open hole. Copies of the geophysical surveys performed on Well No. 10 during this project are contained in **Appendix C.** The caliper survey revealed that the 48-inch diameter well casing extended to a depth of 40 feet bls and the open hole of the well extended to 80 feet bls. The caliper survey revealed that an enlarged borehole existed just below the base of the well casing, to a depth of approximately 48 feet bls. The caliper survey also revealed that several portions of the open hole were restricted to a diameter of approximately 32 inches, representing the diameter of the bit used to drill the open hole. These "tight" zones represented well-indurated zones that were interpreted to have potential confining properties within the aquifer. **Figure 4-1** presents a summary of the caliper log findings and interpretations.

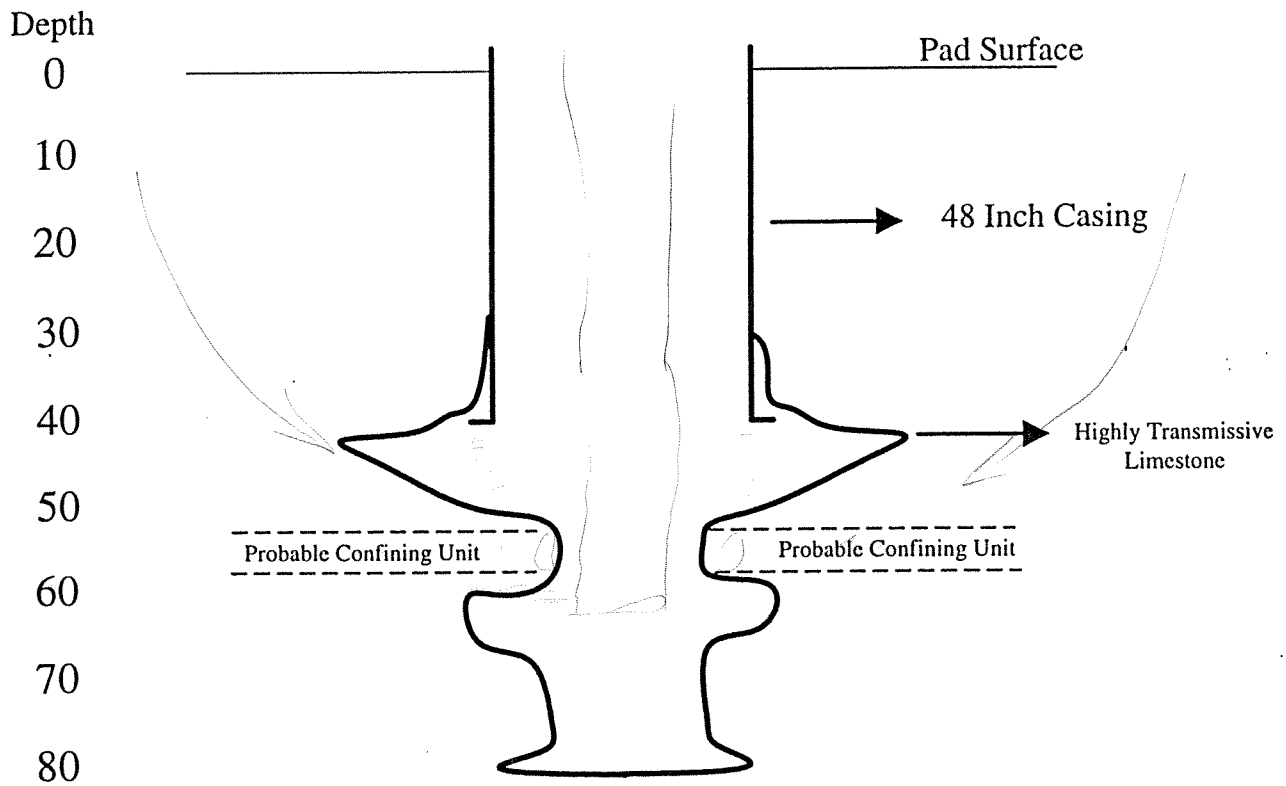
Open Hole Filling and Pressure Grouting

Based on the caliper survey findings, it was decided that the enlarged borehole just below the base of the casing would be sealed during the pressure grout operation. Youngquist then proceeded to fill the borehole with approximately 270 cubic feet of ¼-inch size pea gravel, up to a depth of 50 feet bls. Approximately 60 cubic feet of fine-grained sand was then emplaced on top of the gravel, to a depth of 46 feet bls.

On January 20, a pressure grout operation was conducted on Well No. 10. Prior to the actual cementing operation, a pressure header was welded to the top of the 48-inch casing. The pressure header was configured to allow the passage of a 4-inch diameter work pipe, which was installed to a depth of 37 feet bls (just above the base of the 48-inch well casing). Class "H" cement containing a 2.5% component of Daracem-19, a superplasticizer manufactured by W.R. Grace Co. was then pumped through the work pipe, into the well. The superplasticizer was added to the cement to act as a "wetting agent", to enhance the ability of the cement to flow into small cracks, voids and intersticies within the formation. A total of 482 cubic feet of cement (representing one full tank of cement on Youngquist's equipment) was emplaced under a maximum recorded wellhead pumping pressure of 1.5 pounds per square inch (psi). The cement was emplaced in a total elapsed time of 23 minutes. After the cement was emplaced, fresh water was pumped to displace the cement within the work pipe, which was then pulled up to a depth of 18 feet bls. The wellhead remained sealed at a wellhead pressure of 1.5 psi throughout the operation. The cement was then left to harden overnight.

Reaming Operation

On January 21, the top of the hardened cement was physically tagged at a depth of 37.5 feet bls inside the well casing. Youngquist then prepared to drill the cement plug and open hole with the reverse-air method through the cement plug and ream the open hole to a nominal diameter of 46 inches. Reaming was accomplished with a staged drill bit assembly utilizing a 12-inch



Preliminary Caliper Log Results

diameter stinger (pilot) bit followed by a 46-inch diameter reamer bit. Drilling proceeded on January 27 with a bit rotation of approximately 30 revolutions per minute. The weight on the bit was maintained between a range of approximately 500 pounds to 1,000 pounds. During the reaming operation, cuttings and lithologic samples were collected at 5-foot intervals.

The reaming operation proceeded to a depth of 68 feet bls, in preparation for installing the new 40-inch diameter (0.375-inch wall thickness) steel liner. On February 9 a caliper log was conducted on the reamed hole. A copy of the log is contained in Appendix A. The caliper log revealed that a relatively uniform 56-inch diameter hole extended below the base of the 40-inch pipe to a depth of 68 feet bls with the exception of a 3-foot interval present between the depths of 54 feet bls to 57 feet bls. This "tight" zone was evident on earlier caliper log, and was interpreted to represent the confining zone at the wellfield. The decision was made to set the base of the new 40-inch liner below this zone, so that a seal would exist above the base of the liner to insure separation from any surface water influence.

Liner Installation

On February 9, fine sand was emplaced in the reamed borehole from a depth of 68 feet bls to 65 feet bls in preparation for installation of the new liner. The liner was comprised of two 40-foot long pieces of 0.375-inch wall thickness steel pipe, which were connected by a welded joint. Welding was performed by a Florida-certified welder. The lower portion of one of the pipes was then cut so that the total length of the connected pipe was 64 feet. A cementing header was welded to the top of the liner. Centralizers were welded around the pipe at 90-degree spacings at installed depths of 10 feet bls, 30 feet bls, 46 feet bls and 57 feet bls. The liner was lowered into the well with a crane.

After the liner was lowered to a total depth of 64 feet bls, an alignment test was conducted. A plummet possessing a maximum external diameter of 39 inches passed freely to the bottom of the liner, showing no detectable deviation. A tremie pipe was then lowered through the header, to depth of 50 feet bls. The liner was then pressure grouted into place with 488 cubic feet of Class "H" cement. Wellhead pressure during the cementing operation remained at 0 psi. The cement was then allowed to harden overnight.

The February 13, the top of the hardened cement was physically tagged at a depth of 60 feet bls inside the liner and at a depth of 50.5 feet bls in the annular space, outside the liner. Four stages of Class "H" cement were subsequently emplaced within the annular space of the well, completely filling the outside length of the new liner. A total of 840 cubic feet of cement was emplaced during tremie stages 1,2 and 3, which resulted in a total rise of approximately 3 feet of "fill up" in the annular space, from 50.5 feet bls to 47.5 feet bls. This zone probably represented a large cavity within the Biscayne Aquifer. The forth tremie stage emplaced 194 cubic feet of cement, and resulted in complete annular space fill up, to surface.

Hydrostatic Pressure Test and Alignment Test

On February 20, a hydrostatic pressure test was performed on Well No. 10. The test was conducted over a one-hour period, with an initial pressure of 50 psi. Over the hour-long period, the wellhead pressure declined to a pressure of 48.5 psi, representing a decline of 3%

from the initial pressure. These results successfully demonstrated mechanical integrity of the new liner.

On the same day, the pressure header was removed from the wellhead and an alignment test was performed. For the alignment test, a 35-foot length drill pipe fitted with two spindles measuring 39 inches in outer diameter (approximately ¼-inch less than the inside diameter of the new liner) was lowered down into the new liner. The plummet was lowered into the well while being suspended by a cable and hooked to the crane. During the test, the deviation of the cable from a center position at the wellhead was measured. No detectable deviation from vertical alignment was measured at the wellhead as the plummet was lowered along the entire length of the new liner. These results were interpreted as successfully demonstrating that the new liner was plumb and aligned.

Open Hole Drilling and Development

On February 23 Youngquist initiated drilling out the cement plug of the new liner. Drilling was performed using the reverse-air method, with a staged bit assembly. A 12-inch pilot bit was followed by a 36.5-inch reaming bit. Drilling took place from the base of the new liner at 64 feet bls to 80 feet bls (the original depth of the well) over a three-day period.

Upon reaching the original total well depth, reverse-air development took place by utilizing the drill bit assembly. During this portion of the development, an air compressor was used to force air down the inside of the drill pipe. The air exited out at holes located at the drill bit, forcing cuttings and water up, out the discharge hose (routed out of the roof of the wellhouse) at rates of approximately 500 gallons per minute. The drill pipe and bit assembly was raised and lowered along the entire length of the open hole (from 64 feet bls to 80 feet bls) for a 10-hour period during this process.

Pumping Development

After air development was complete, the drill pipe and bit assembly were removed from the well and a centrifugal pump was delivered to the site. On February 3, pumping development commenced through a 12-inch diameter drop pipe (lowered into the well to a depth of 40 feet bls). Prior to start-up, the depth to the "static" water level in the well was measured at approximately 5 feet bls. A pumping rate of 645 gpm (equivalent to approximately 1 million gallons of water per day [mgd]) was initially established. During pumping at this rate, the water level in the well declined to approximately 29 feet bls (equating to a total drawdown of 24 feet, and a specific capacity of 27 gallons per minute per foot of drawdown [gpm/ft]). A higher pumping rate could not be achieved because the centrifugal pump could not "lift" water that was deeper than 29 feet bls in the well. Over the next two days, pumping development and surging took place at rates of between 300 gpm and 680 gpm.

Borehole Deepening

The results of the specific capacity data collected during the pumping development indicated that Well No. 10 could be pumped at a maximum rate of approximately 1 mgd with acceptable drawdown. To improve the well capacity, it was determined that the open hole should be

extended, to permit water flow into the well from deeper zones of the aquifer. The 38-inch diameter drill bit was lowered into the well and the open hole was extended to 120 feet bls. Air-lift development again took place through the drill bit, at a rate of approximately 500 gpm for one day.

Direct Air-Lift Development

To increase the effectiveness of the air-lift process, the drill bit assembly was then removed, and a 7-inch diameter pipe was lowered into the well, to a depth of 40 feet bls. Two air compressors were then connected to the air-line, each compressor capable of pumping 1,000 cubic feet of air per minute at a pressure of 150 psi. The well was then surged in this configuration for 2 hours. The air pipe was then lowered to a depth of 61 feet bls, and the air surging and development process was continued for another 4 hours. The following day the air pipe was lowered an additional 10 feet, to a total depth of 71 feet bls (7 feet below the bottom of the 40-inch casing). With the pipe configured at this depth, surges of up to 2,000 gpm were achieved. Air-lift development took place for an additional 8 hours with the air pipe at 71 feet bls.

Pumping Development

After air-lift development was complete, the centrifugal pump assembly was again lowered into the well, to begin pumping development. On May 1, 1998, the static water level measured in the well was approximately 6 feet bls. At first, a pumping rate of 3,000 gpm was established, with a pumping water level of 14 feet bls. The pumping rate was then increased to 3,700 gpm (equivalent to a daily rate of approximately 5.3 mgd), and the water level in the well declined to 17.2 feet bls. The specific capacity of the well at this rate was equivalent to 330 gpm/ft.

During pumping development, a flowmeter log and video survey (conducted by MDWASD) were performed. A copy of the flowmeter log is contained in Appendix A. Upon the completion of the pumping development for the day, a caliper log was also conducted. Analysis of these logs indicated that most of the water produced by the well was flowing into the open hole from the interval between 67 feet bls and 80 feet bls.

Acidization

To increase the yield of the well, the open hole was back-filled with pea gravel and fine sand to a depth of 82.5 feet bls. On May 14, 1998, 4000 gallons of a 19% muriatic acid solution was pumped into Well No. 10 through an open-ended work pipe installed to a depth of 70 feet bls. The acid was blended with an inhibiting agent prior to emplacement to minimize potential corrosion of the steel well casing. During the acidization, the wellhead was sealed and wellhead pressures were monitored. A bleed-off valve was mounted on the wellhead piping to relieve pressures developed by carbon dioxide gas production during the acidization process. Wellhead pressures were not allowed to exceed 16 psi at any time during the procedure. Following emplacement of the acid, 700 gallons of fresh water were pumped into the work pipe to displace the acid into the formation. After the water was emplaced, the well was shut in for a period of 10 hours.

Post-Acidization Development and Testing

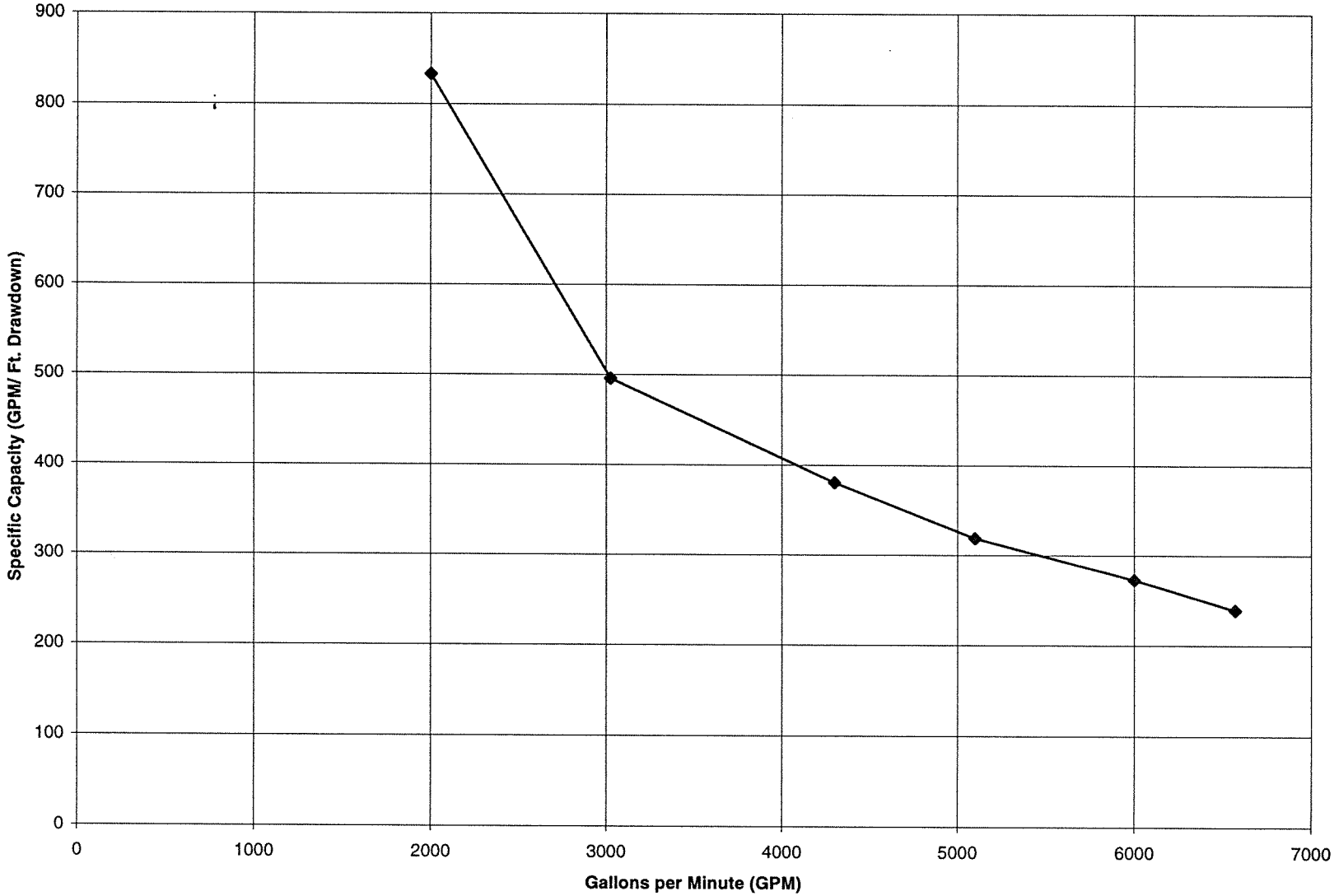
Following the acidization procedure, the sand and gravel was removed by drilling to a depth of 106 bls. The centrifugal pump assembly was again lowered into the well. On May 20, 1998, a pumping rate of 4,500 gpm was then established with a water level of approximately 21 feet bls recorded in the well. The measured static water level in the well prior to pumpage was approximately 9 feet bls, therefore a specific capacity of 375 gpm/ft of drawdown was achieved at Well No. 10. A 14% increase in specific capacity was achieved through implementing the acidization procedure. Pumping development then took place over an 8 hour period.

On June 26, 1998 the original turbine pump (newly configured to drop the intake at a depth of 47.5 feet bls) was lowered into Well No. 10, to test the feasibility of utilizing the existing equipment. The well was then tested at a variety of pumping rates, which were achieved by adjusting a valve mounted on 24-inch diameter discharge piping. The results of the specific capacity testing conducted are summarized on **Table 4-1** and is presented graphically on **Figure 4-2.** An as-built diagram of the re-completed is presented on **Figure 4-3.** Youngquist Bros. subsequently filed a Well Completion Report at the SFWMD, a copy of which is included in **Appendix D.**

Table 4-1
Step-Rate Pumping Test Summary

Pumping Rate (gpm)	Water Level (fbls)	Drawdown (ft)	Specific Capacity (gpm/ft)
0	10.5	0	0
2,000	13	2.5	800
3,025	17	6.5	465
4,300	22	11.5	370
5,100	27	16.5	310
6,000	33	21.5	280
6,565	38	26.5	250

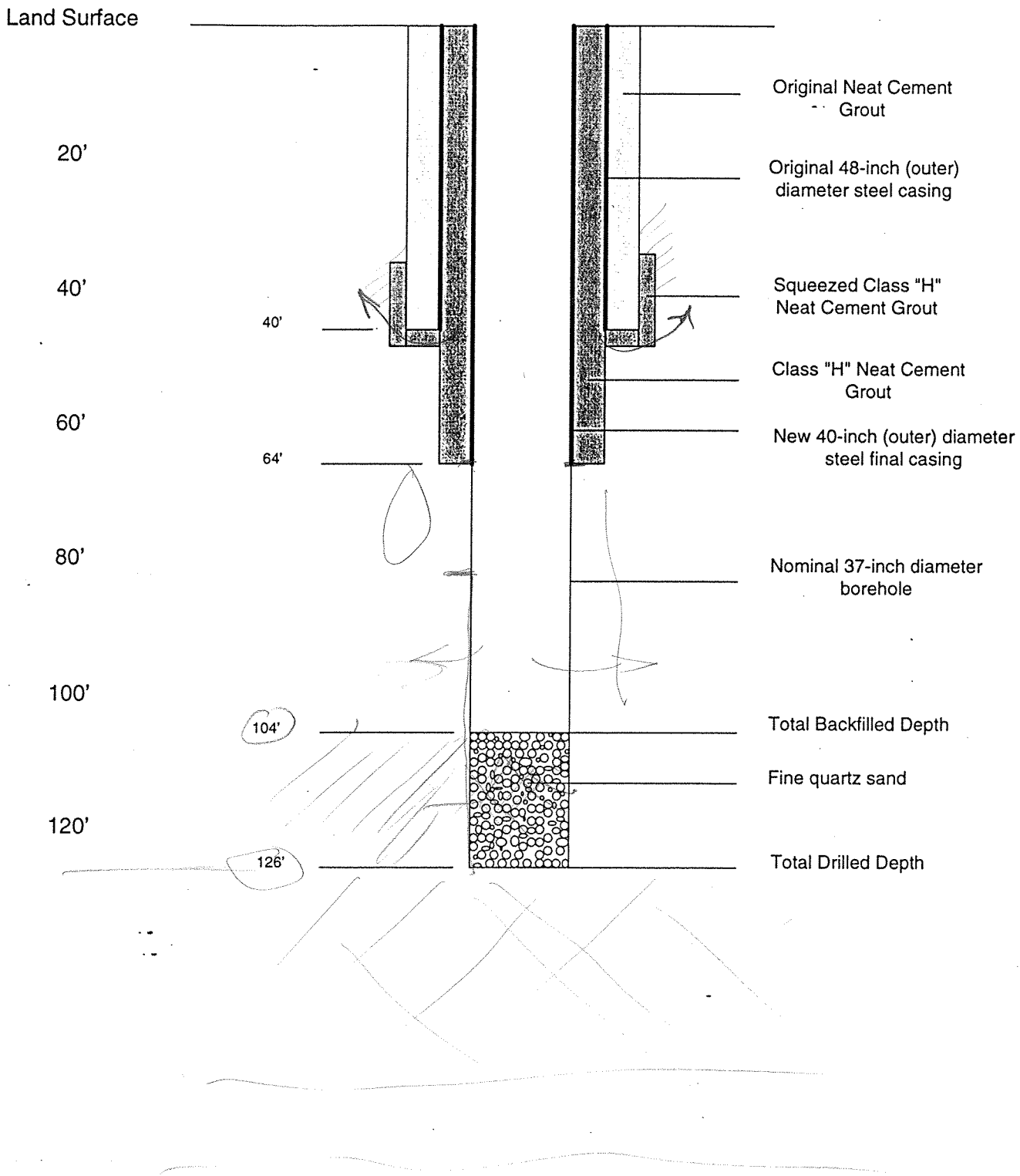
The well was then disinfected and subjected to bacteriological clearance, as per Health Department permit requirements. Twenty water samples collected from Well No. 10 between June 30, 1999 and July 9, 1999 did not contain observed concentrations of bacteria, and the well was cleared for service.



MONTGOMERY WATSON

Specific Capacity Data Summary

Figure 4-2



MONTGOMERY WATSON

Well No. 10 Final As-Built Diagram

Figure 4-3

Section 5

MONTGOMERY WATSON

Section 5
Post-Rehabilitation Water Quality

Following the re-installation of pumping equipment and obtaining bacteriological clearance, Well No. 10 was placed back into service by MDWASD. Three weeks after being placed back into service, a water sample was collected from the wellhead tap. The water was analyzed by Harbor Branch Environmental Laboratories for federal primary and secondary drinking water standard constituents. The bacteriological and Harbor Branch laboratory results are contained in **Appendix E** and summarized on **Table 5-1.**

Table 5-1
Post-Rehabilitation Water Quality Summary

Constituent	Method	Concentration
Color	2120 B	90 CU
Chloride	300.0	63 mg/L
Alkalinity*	2320 B	216 mg/L
Total Hardness*	130-2	270 mg/L
Iron	200.7	1.0 mg/L
PH	150.	7.3*
Total Dissolved Solids	2540 C	360
Volatile Organics	524.2	Bdl
Pesticides and PCBs	Multiple	Bdl
Unregulated Group I	Multiple	Bdl
Unregulated Group II	524.2	Bdl
Unregulated Group III	625	Bdl
Gross Alpha	900.0	2.8 pCi/L

Notes: "Bdl" signifies below detection limits
"*" signifies results reported by the MDWASD Laboratory

The laboratory results indicated that there were no exceedances of federal primary drinking water standards and the only secondary drinking water standards that were exceeded were color and iron.

MPA Sampling Results

As per the Agreement, water samples were collected from the Well No. 10 during the wet and dry seasons following the rehabilitation. The water samples were split and analyzed by Montgomery Watson Laboratories under contract to MDWASD and the Tampa Branch of the Florida Department of Health Laboratory under contract to the FDEP. The laboratory analysis sheets are contained in **Appendix F** and the resultant EPA Relative Risk Factors are summarized on **Table 5-2.**

Table 5-2
Post-Rehabilitation MPA Results Summary

Date of Sample		Rainfall (inches)	Montgomery Watson Laboratory Result	Florida Department of Health Laboratory Results
August 24, 1998	Wet Season	2.69	4	9
September 9, 1998	Wet Season	2.44	5	4
December 8, 1998	Dry Season	0.29	5	14
February 22, 1999	Dry Season	0.00	9	14

The results of the MPA sampling indicate concentrations that equate to Categories "A" and "B", as specified within the Agreement. These results compare favorably with those obtained by the FDEP from Well No. 10 prior to the rehabilitation, which yielded Relative Risk Factors of 15, 16 and 23 from samples collected in December 1995 and October 1996, respectively. **Table 5-3** presents a characterization of the particles counted from each of the MPA's and reveals that the material consisted of algae and plant debris. The results of these tests indicate that the rehabilitation has been successful in reducing the concentration of surface related particulate matter in water produced from Well No. 10. This data satisfy the requirements set forth by the FDEP in the Agreement for reconsideration of the designation of Well No. 10 as GWUDI.

Date Sampled	EPA RRF Total	*Giardia*	Coccidia	Diatoms	Other Algae	Insects/ Larvae	Rotifers	Plant Debris
8/24/98								
Lab A	4	<1	<1	<1	5	<1	<1	1
Lab B	9	NA	NA	0	31	0	0	0
9/9/98								
Lab A	5	<1	<1	<1	1	<1	<1	42
Lab B	4	NA	NA	0	14	0	0	0
12/08/98								
Lab A	5	<1	<1	<1	6	<1	<1	28
Lab B	14							
2/24/99								
Lab A	9	<1	<1	<1	55	<1	<1	4
Lab B	14	NA	NA	0	874	0	0.1	0.1

NA: Not assayed

Section 6

Section 6
Conclusions and Recommendations

Post rehabilitation test results indicate that construction rehabilitation has successfully reduced the concentration of particulate matter produced in water collected from Well No. 10 at MDWASD's Northwest Wellfield.

Well No. 10 has been re-completed to restore the casing grout integrity and draw water from an open-hole set within the Tamiami Formation, between 64 feet bls and 104 feet bls. The well now yields water at a rate of 250 gallons per minute per foot of drawdown when pumped at a rate of 6,500 gpm (equivalent to 9.4 mgd). This represents a significant reduction in the specific capacity of the well when compared with the original specific capacity of 1,030 gpm/ft when the well was first installed. This reduction in capacity has resulted in the need to install additional column pipe on the existing pump for the well.

MPA data collected following the rehabilitation of Well No. 10 indicates that the concentration of particulate matter has been successfully reduced to acceptable concentrations. Modifying the production wells at the Northwest Wellfield by installing a deeper casing through the existing casing allows for restoring the casing grout integrity, a concern associated with the possible short-circuiting of flow around the outside of the casing. Installing the inner (new) casing at a deeper position within the aquifer further insures against possible short-circuiting of flow and provides additional filtration. When additional wells in the Northwest Wellfield are subjected to similar construction rehabilitations, the new casings should be set at depths that will enable the wells to maintain relatively high specific capacities while reducing concentration of particulate matter to acceptable levels.

Appendix A

South Florida Water Management District

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-8800 • FL WATS 1-800-432-2045
TDD (561) 697-2574

CON 24-06

January 07, 1998

PERMITTEE
MIAMI-DADE WATER & SEWER AUTHORITY
3575 S. LEJEUNE ROAD
MIAMI, FL 33146

CONTRACTOR
YOUNGQUIST, TIM
15465 PINE RIDGE ROAD
FT. MYERS, FL 33908
LICENSE NO:2172

WATER WELL REPAIR **PERMIT # SF010698A**
EXPIRATION DATE: July 07, 1998

PROJECT: REHABILITATION OF NW WELLFIELD WELL #10
TYPE OF USE: PUBLIC WATER SUPPLY
COUNTY: MIAMI-DADE SEC: 11 TWP: 53 RGE: 39

WELL REPAIR SPECIFICATIONS:	INNER	OUTER
CASING DIAMETER:	40"	48"
CASING DEPTH:	60.00'	40.00'
SCREENED INTERVAL:	-	
OPEN HOLE INTERVAL:	60' - 80'	
TOTAL DEPTH OF WELL:	80.00'	

GROUT REQUIREMENT:
Inner casing shall be grouted bottom to top.
Outer casing shall be grouted bottom to top.

See additional conditions of permit on attached sheet.

We appreciate your assistance and cooperation in better managing the water resources of the District. If you have any questions on this matter, please call Ann-Marie Superchi at extension 6929.

Sincerely,

Jeffrey Rosenfeld

Jeffrey Rosenfeld, P.G., Supervising Professional
Water Use Division, Regulation Department

Attachment: Additional Conditions of Permit
c: MR. JOSE ANGUEIRA-DERM
MR. JOHN MORRAH-DEP

ai: file

REHABILITATION OF NW WELLFIELD WELL #10
January 07, 1998

DESCRIPTION OF WELL REPAIRS

INSTALL & GROUT A 40" CASING INSIDE THE EXISTING 48" CASING.

COMPLETION REPORT REQUIRED

A Water Well Completion Report (Form 0124) must be filed with the District within 30 days of completion of work.

ADDITIONAL CONDITIONS OF PERMIT

The well must be cleaned, disinfected and bacteriologically cleared in accordance with Chapter 62-555, F.A.C. The bacteriological clearance data shall be submitted to the County Health Unit or appropriate office of the Department of Environmental Protection and release for use must be obtained prior to placing the well in service.

A grouting card (Form 0196) must be supplied to the District prior to beginning construction.

FLORIDA DEPARTMENT OF HEALTH

Lawton Chiles
Governor

James T. Howell, M.D., M.P.H.
Secretary

NOTICE OF PERMIT

CERTIFIED MAIL P 255 943 680
RETURN RECEIPT REQUESTED

Miami-Dade Water and Sewer Department,
Hialeah-Preston Northwest Wellfield rehabilitation
of production well No. 1

MIAMI - DADE WATER AND SEWER AUTHORITY DEPT.
RECEIVED
NOV 2 6 1997
SD ENGINEERING DIVISION SD

Eugene V. McLoughin, P.E.
Miami Dade Water & Sewer Department
3575 S. Lejeune Road
Miami, Florida 33146

November 25, 1997

Dear Mr. McLoughin:

Enclosed is Permit Number 125469-123WC to construct the above-referenced Water Well Rehabilitation, located at Hialeah-Preston Northwest Wellfield, Hialeah, Dade County, issued Pursuant to Section 403, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeals. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

If you have any question please contact Samir Elmir, P.E. of this office, phone (305) 623-3551.

Executed in Dade County, Florida.

STATE OF FLORIDA
DEPARTMENT OF HEALTH

Eleni D. Iglesiadis, MD
for Annie R. Neasman, R.N., M.S.
Executive Administrator

Copies furnished to:
Morton Laitner, Esq., Legal Counsel
Samir Elmir, P.E., MS

w: file

Annie R. Neasman, RN, MS, Executive Administrator
Dade County Health Department / Environmental Health / Engineering
1725 N.W. 167 Street, Miami, Florida 33056
TEL (305) 623-3551 • FAX (305) 623-3620

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on 11/26/97 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to the 120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Gardenia Pierre 11/26/97

Gardenia Pierre Date

Clerk

FLORIDA DEPARTMENT OF HEALTH

Lawton Chiles
Governor

James T. Howell, M.D., M.P.H.
Secretary

PERMITTEE:
Eugene V. McLoughin
Miami Dade Water & Sewer Dept.
700 West 2nd Avenue
Hialeah, Florida 33010

PERMIT No: 125469-123WC
DATE OF ISSUE: November 24, 1997
EXPIRATION DATE: November 23, 2002
COUNTY: DADE COUNTY
LATITUDE/LONGITUDE: N/A
SECTION/TOWNSHIP/RANGE: 53/39/11
PROJECT: Miami-Dade Water and Sewer Department, Hialeah-Preston Northwest Wellfield rehabilitation of production well No. 10.

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 62-4, 62-550, 62-555 & 62-560. The above named permittee is hereby authorized to perform the work shown on the application, technical specifications 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: At Miami-Dade Water and Sewer Department Northwest Wellfield production well No.10 install a new 40 inch diameter steel well casing liner inside of the existing 48 inch casing, regrouting, reinstalling of existing well pump and appurtenances including, disinfection, testing and clearance as per FAC. 62-555.

TO SERVE: Miami-Dade Water and Sewer Department Hialeah-Preston Water Treatment Plant, 700 West 2nd Avenue, Hialeah, Dade County, Florida.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

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 by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any 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 or 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 or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; 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, 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 the 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 may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of noncompliance; and

(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence if 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 prescribed by Section 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 Rule 62-4.120 and 62-30.300, F.A.C., as applicable. 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. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

(X) Certification of compliance with state Water Quality Standards (Section 401, PL 92-500)

( ) Compliance with New Source Performance Standards

14. 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 will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by the permit records of all monitoring information (including all 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 date 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.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the 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.

SPECIFIC CONDITIONS:

1. The applicant is responsible for retaining the engineer of record in the application for supervision of the construction of this project and upon completion, the engineer shall inspect for complete conformity to the plans and specifications as approved.

2. This well shall be cleaned, disinfected and bacteriologically cleared in accordance with Chapter 62-555 Florida Administrative Code and AWWA Standard C654-87.

3. All concrete coatings/admixtures, liners, grouts, hoses, tubings, and protective paints and coatings shall be listed by the National Sanitation Foundation as acceptable for contact with potable water.

4. This construction permit is issued with the understanding that pipe material and appurtenances used in this installation will be in accordance with the latest applicable AWWA & NSF Standards for public water supplies.

5. Prior to placing a system into service, the applicant shall submit to the Department one (1) set of record drawings of the completed project with completed form DEP 62.555.910(9) [Certification of Construction Completion and Request for a Letter of Clearance to Place a Public Drinking water facility into Service] signed by the engineer of record. Drawings are to be at the same scale and in the same sequence as those submitted and approved for permit. Deviations from the original permitted drawings are to be highlighted and/or noted for the Department's review. Include with the DEP form the bacteriological clearance data, pressure test results and backflow inspection certification (if applicable).

Issued this 25th day of Nov. 1997

STATE OF FLORIDA
DEPARTMENT OF HEALTH

for Eleni D. Galiouraki, MD
Annie R. Neasman, R.N., M.S.
Executive Administrator

Appendix B

LITHOLOGIC DESCRIPTION

Date : 7-1-98
Contractor : YBI
Location : Miami Dade Water and Sewer Department Northwest Wellfield
Well : 10

DEPTH	DESCRIPTION
45' - 50'	LIMESTONE 100%; yellowish gray to white, packstone, grain size: fine to medium, porosity: <5%, partially recrystallized, mollusks
50' - 55'	LIMESTONE 100%; light greenish gray to white, packstone, grain size: fine to medium, porosity: 25% moldic to vuggy , partially recrystallized, mollusks
55' - 65'	LIMESTONE 100%, yellowish gray to white, packstone, grain size: medium to coarse, porosity: 20% moldic, 20% allochems, mollusks,
65' - 80'	LIMESTONE 90%; yellowish gray to white, packstone, grain size: medium to coarse, porosity: 10%, partially recrystallized, coquina, carbonate clasts SAND 10%, yellowish brown to white, grain size: medium to coarse, sub-angular to rounded
80'-85'	LIMESTONE 100%; yellowish gray to white, packstone, grain size: fine to medium, porosity: <5%, recrystallized, mollusks
85'-92'	SHELL 60%, medium gray to light orange, medium to coarse grained, mollusks, bryozoans LIMESTONE 35%, medium gray to light gray, packstone SAND 5%, yellowish brown to white, medium to coarse, sub-angular to rounded
93'-107'	SHELL 80%, pale olive to gray, unconsolidated, grain size: medium sand to gravel, mollusks, bryozoans LIMESTONE 20%, gray to light gray, packstone, silty

DEPTH	DESCRIPTION
107'-117'	SHELL 80%, medium gray to light orange, olive silt matrix, mollusks, bryozoans, foraminifera LIMESTONE 20%, gray to white, packstone, 15% quartz sand in calcite matrix
117'-119'	SHELL 80%, medium gray to light orange, olive silt matrix, grain size: medium sand to gravel, mollusks, bryozoans, foraminifera LIMESTONE 20%, gray to white, packstone, 15% quartz sand in calcite matrix
120'	SANDY SILT 80%, olive, with 20% LIMESTONE clasts

Appendix C

FILE NO. ______

FLORIDA GEOPHYSICAL LOGGING, INC.

FLOWMETER LOG

COMPANY MIAMI DADE WATER A7 SEWER DEPT.
WELL NWWF #10
FIELD NORTH WEST WELL FIELD
COUNTY DADE STATE FLORIDA
LOCATION
OTHER SERVICES: X-Y CALIPER
SEC. ___ TWP ___ RGE ___

PERMANENT DATUM PAD LEVEL ELEV. ___
LOG MEASURED FROM PAD FT. ABOVE PERMANENT DATUM
DRILLING MEASURED FROM PAD
ELEV.: K.B. ___ D.F. ___ G.L. ___

DATE	01-MAY-1998
RUN NO.	
TYPE LOG	FLOWMETER
DEPTH-DRILLER	120'
DEPTH-LOGGER	120'
LOGGED INTERVAL	120' TO 40'
OPERATING RIG TIME	1.5 HOURS
TYPE FLUID IN HOLE	WATER
SALINITY, PPM CL	NA
DENSITY-VISCOSITY	NA
LEVEL	8' BELOW PAD
MAX. REC. TEMP. DEG F.	NA
EQUIPMENT-LOCATION	102 FTM
RECORDED BY	LEE
WITNESSED BY	T.URAM

BOREHOLE RECORD				CASING RECORD			
RUN NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
	38 1/2"	120'	CASING	40"		64'	SURFACE

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFULL NEGLEGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS

MERGED STATIC AND DYNAMIC PASSES AT 100 FPM.
FLOWRATE = 3.000 GPM.

VERSION: 2.42

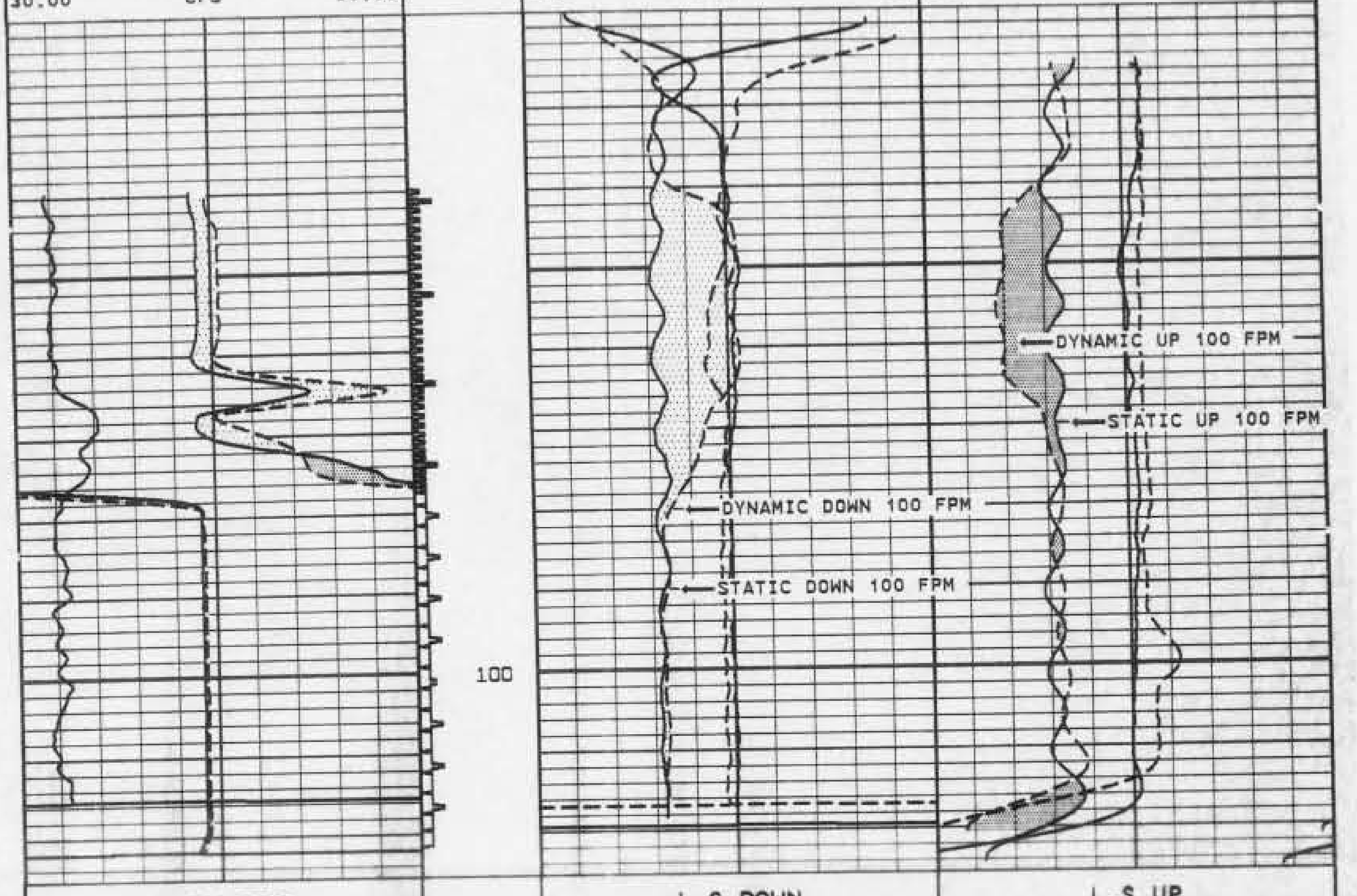
FINISH DEPTH: **23.2** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **10:20:48** MODE: **TRACE PLAYBACK**

Y>X CALIPER | X>Y CALIPER | APPARENT FLOW | APPARENT FLOW

GAMMA RAY BACKUP 100 (API) 200
GAMMA RAY 0 (API) 100
Y-CALIPER 30.00 CPS 50.00
X-CALIPER 30.00 CPS 50.00

DYNAMIC DOWN 100 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50
STATIC DOWN 100 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50

DYNAMIC UP 100 FPM 0.0 CPS 100.0
L.S UP -50 FPM 50
STATIC UP 100 FPM 0.0 CPS 100.0
L.S UP -50 FPM 50



X-CALIPER 30.00 CPS 50.00
Y-CALIPER 30.00 CPS 50.00
GAMMA RAY 0 (API) 100
GAMMA RAY BACKUP 100 (API) 200

L.S DOWN -50 FPM 50
STATIC DOWN 100 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50
DYNAMIC DOWN 100 FPM 0.0 CPS 100.0

L.S UP -50 FPM 50
STATIC UP 100 FPM 0.0 CPS 100.0
L.S UP -50 FPM 50
DYNAMIC UP 100 FPM 0.0 CPS 100.0

X>Y CALIPER | Y>X CALIPER | APPARENT FLOW | APPARENT FLOW

START DEPTH: **125.5** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **10:20:04** MODE: **TRACE PLAYBACK**

VERSION: 2.42

REMARKS

MERGED STATIC AND DYNAMIC PASSES AT 75 FPM.
FLOWRATE = 3,000 GPM.

VERSION: 2.42

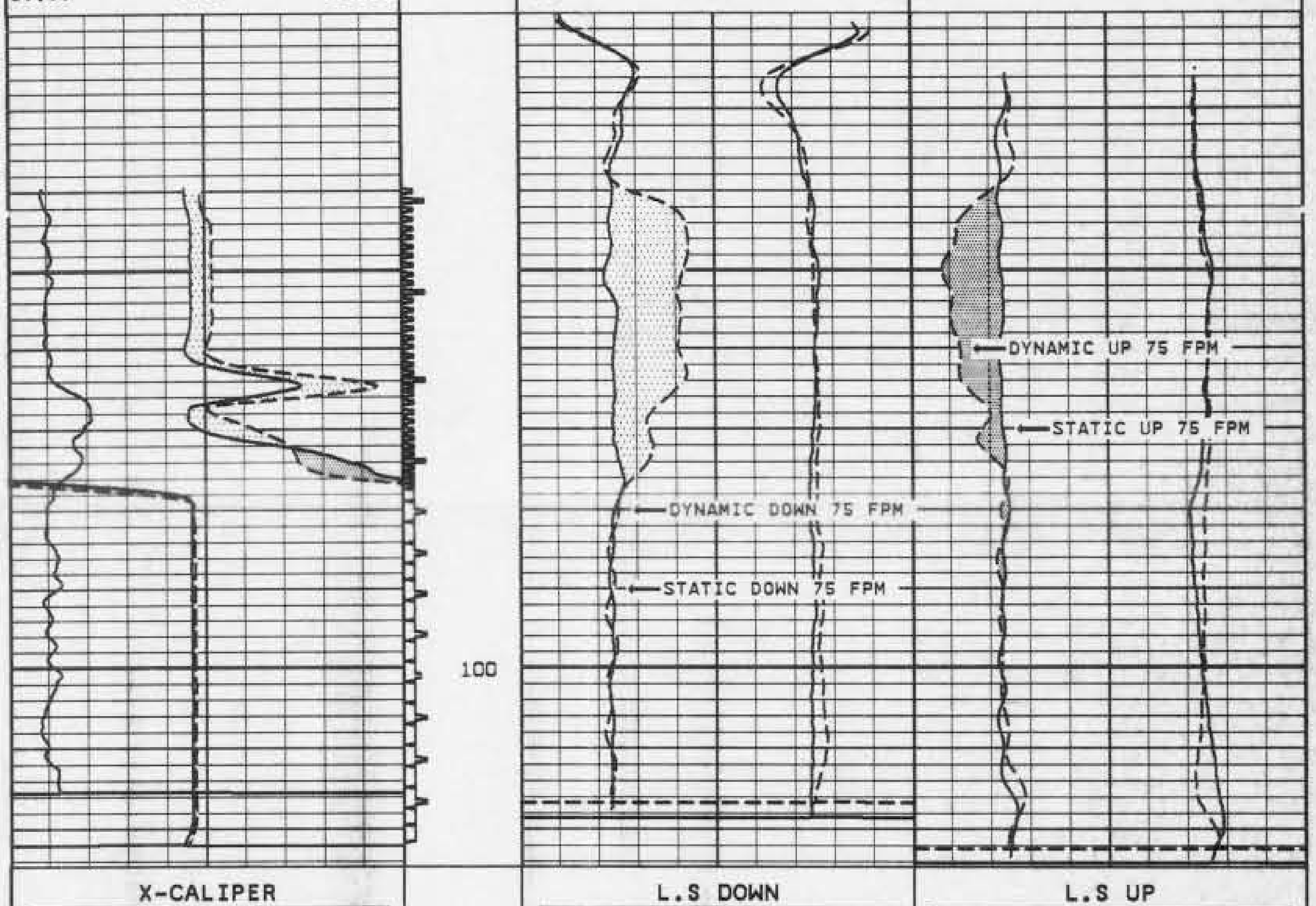
FINISH DEPTH: **23.1** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **10:14:04** MODE: **TRACE PLAYBACK**

Y>X CALIPER | X>Y CALIPER | APPARENT FLOW | APPARENT FLOW

GAMMA RAY BACKUP 100 (API) 200
GAMMA RAY 0 (API) 100
Y-CALIPER 30.00 CPS 50.00
X-CALIPER 30.00 CPS 50.00

DYNAMIC DOWN 75 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50
STATIC DOWN 75 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50

DYNAMIC UP 75 FPM 0.0 CPS 100.0
L.S UP 50 FPM -50
STATIC UP 75 FPM 0.0 CPS 100.0
L.S UP 50 FPM -50



X-CALIPER 30.00 CPS 50.00
Y-CALIPER 30.00 CPS 50.00
GAMMA RAY 0 (API) 100
GAMMA RAY BACKUP 100 (API) 200

L.S DOWN -50 FPM 50
STATIC DOWN 75 FPM 0.0 CPS 100.0
L.S DOWN -50 FPM 50
DYNAMIC DOWN 75 FPM 0.0 CPS 100.0

L.S UP 50 FPM -50
STATIC UP 75 FPM 0.0 CPS 100.0
L.S UP 50 FPM -50
DYNAMIC UP 75 FPM 0.0 CPS 100.0

X>Y CALIPER | Y>X CALIPER | APPARENT FLOW | APPARENT FLOW

START DEPTH: **124.7** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **10:12:33** MODE: **TRACE PLAYBACK**

VERSION: 2.42

REMARKS

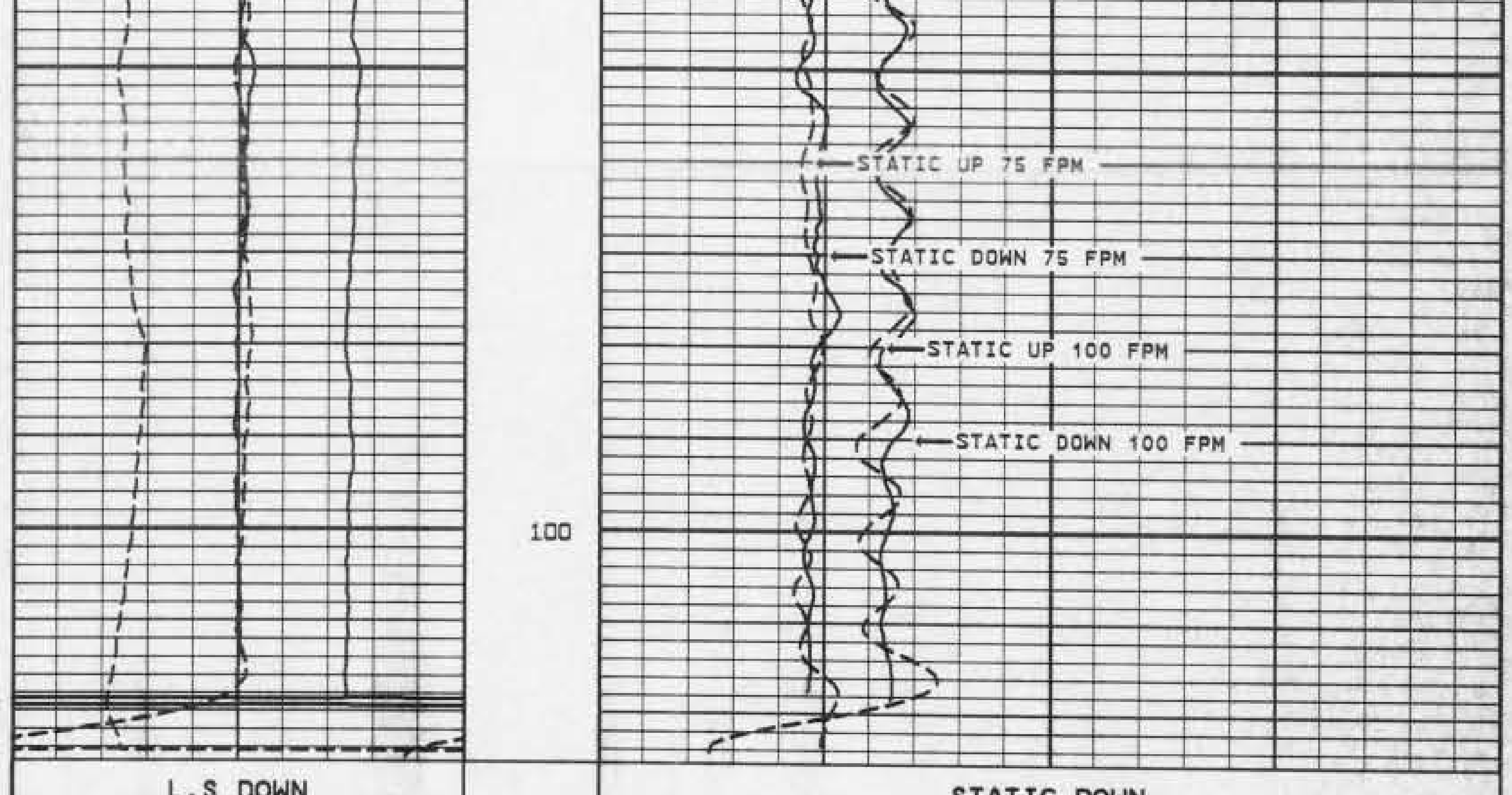
CALIBRATION PASSES AT 75 & 100 FPM.

VERSION: 2.42

FINISH DEPTH: **23.1** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **09:56:15** MODE: **TRACE PLAYBACK**

L.S UP -50 FPM 50
L.S DOWN -50 FPM 50
L.S UP -50 FPM 50
L.S DOWN -50 FPM 50

STATIC UP 0.0 CPS 100.0
STATIC DOWN 0.0 CPS 100.0
STATIC UP 0.0 CPS 100.0
STATIC DOWN 0.0 CPS 100.0



L.S DOWN -50 FPM 50
L.S UP -50 FPM 50
L.S DOWN -50 FPM 50
L.S UP -50 FPM 50

STATIC DOWN 0.0 CPS 100.0
STATIC UP 0.0 CPS 100.0
STATIC DOWN 0.0 CPS 100.0
STATIC UP 0.0 CPS 100.0

START DEPTH: **125.5** FEET DIRECTION: **UP** DATE: **05/04/98** TIME: **09:55:43** MODE: **TRACE PLAYBACK**

VERSION: 2.42

COMPANY MIAMI DADE WATER & SEWER DEPT.
WELL NWWF #10
FIELD NORTH WEST WELL FIELD STATE FLORIDA

FLORIDA GEOPHYSICAL LOGGING, INC.

X-Y CALIPER
GAMMA RAY
LOG

COMPANY MIAMI DADE WATER AND SEWER DEPT.

WELL WELL #10

FIELD NORTH WEST WELL FIELD

COUNTY DADE STATE FLORIDA

LOCATION

SEC. TWP. RGE.

FILE NO.

OTHER SERVICES:
NONE

PERMANENT DATUM PAD LEVEL ELEV.
LOG MEASURED FROM PAD FT. ABOVE PERMANENT DATUM
DRILLING MEASURED FROM PAD

ELEV.: K.B.
D.F.
G.L.

DATE	14-JANUARY-1998
RUN NO.	ONE
TYPE LOG	X-Y CALIPER/GR
DEPTH-DRILLER	82'
DEPTH-LOGGER	82'
LOGGED INTERVAL	82' TO SURFACE
OPERATING RIG TIME	1.5 HOURS
TYPE FLUID IN HOLE	WATER
SALINITY, PPM CL	NA
DENSITY-VISCOSITY	NA
LEVEL	5'
MAX. REC. TEMP. DEG F.	NA
EQUIPMENT-LOCATION	102 FTM
RECORDED BY	LEE
WITNESSED BY	VERRASTRO, SEITH

BOREHOLE RECORD

RUN NO.	BIT	FROM	TO

CASING RECORD

SIZE	WGT.	FROM	TO
48"	.5 M.T.	40'	SURFACE

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REMARKS

XY CALIPER/GAMMA RAY TOOL STRING CONFIGURATION

-- GAMMA RAY -- 3 FT. LONG
MEASURE POINT 7.5 FT. FROM BOT

-- TOTAL TOOL STRING LENGTH = 9 FT. --

-- XY CALIPER -- 6 FT. LONG

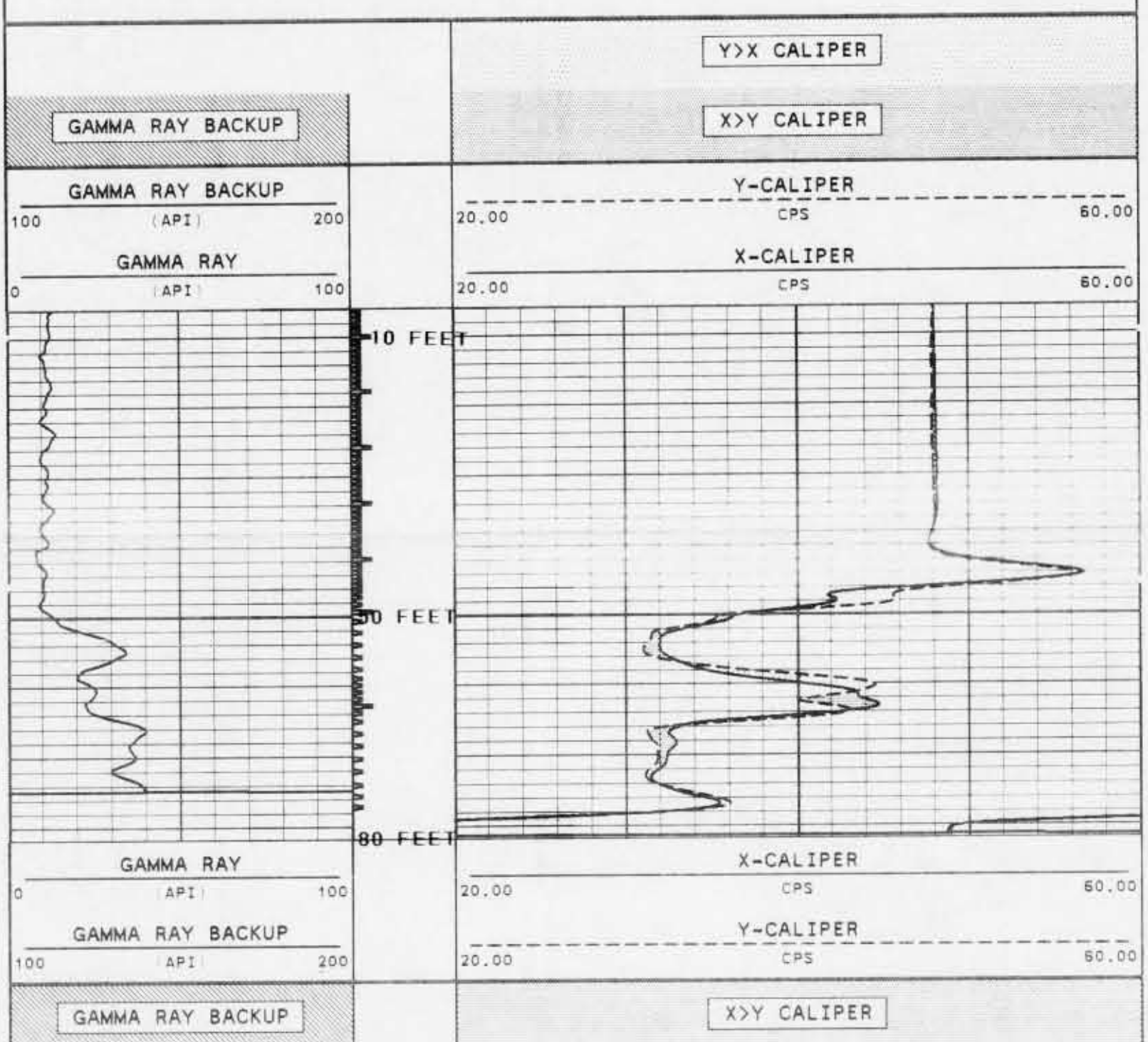
-- LONG ARM MEASURE POINT 1 FT. FOM BOT

-- BOT

VERSION: 2.42

WELL10

FINISH DEPTH: **5.6** FEET DIRECTION: **UP** DATE: **01/14/98** TIME: **13:54:12** MODE: **RECOMPUTE**



START DEPTH: **81.4** FEET DIRECTION: **UP** DATE: **01/14/98** TIME: **13:51:39** MODE: **RECOMPUTE**

WELL10

VERSION: 2.42

BEFORE SURVEY CALIBRATION SUMMARY

FILE: DATE: 01/14/98 TIME: 14:00 VERSION: 2.42

X-CALIPER #14

DATE: 01/14/98 TIME: 12:27

	MEASURED	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
30"	22.6	30.0	22.6	22.8	0.08	CPS
40"	30.1	40.0	30.0	30.2	0.10	CPS
58.5"	42.8	58.5	42.6	42.8	0.11	CPS

Y-CALIPER #14

DATE: 01/14/98 TIME: 12:27

	MEASURED	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
30"	23.2	30.0	23.1	23.3	0.13	CPS
40"	30.3	40.0	30.3	30.5	0.08	CPS
58.5"	42.5	58.5	42.5	42.7	0.09	CPS

BEFORE SURVEY CALIBRATION SUMMARY

FILE: DATE: 01/14/98 TIME: 14:00 VERSION: 2.42

GR API CAL #10

DATE: 01/14/98 TIME: 12:27

	MEASURED	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
BEFORE: BACKGROUND	44.6	0.0	18.5	62.6	8.32	API
BEFORE: CALIBRATOR	398.1	200.0	388.9	408.3	16.21	API

COMPANY MIAMI DADE WATER AND SEWER DEPT.

WELL NORTH WEST WELL FIELD #10

FIELD NORTH WEST WELL FIELD STATE FLORIDA

FLORIDA GEOPHYSICAL LOGGING, INC.

X-Y CALIPER
GAMMA RAY
LOG

COMPANY MIAMI DADE WATER AT SEWER DEPT.
WELL N&WF #10
FIELD NORTH WEST WELL FIELD
COUNTY DADE STATE FLORIDA
LOCATION SEC.: TWP.: RGE.:
OTHER SERVICES: FLOWMETER

FILE NO.

PERMANENT DATUM PAD LEVEL
LOG MEASURED FROM PAD FT. ABOVE PERMANENT DATUM
DRILLING MEASURED FROM PAD ELEV.: K.B. G.L.

DATE	01-MAY-1998
RUN NO.	
TYPE LOG	X-Y CALIPER/GR
DEPTH-DRILLER	120'
DEPTH-LOGGER	120'
BTM. LOG INTERVAL	120' TO 40'
OPERATING RIG TIME	1.5 HOURS
TYPE FLUID IN HOLE	WATER
DENSITY-VISCOSITY	NA
MAX. REC. TEMP. F.	NA
LEVEL	8' BELOW PAD
EST. CEMENT TOP	NA
WITNESSED BY	LOS FTM
RECORDED BY	LEE

CASING RECORD	SIZE	FROM	TO
SURFACE	8"	40'	0'
HOLE	7 7/8"	120'	40'

RUN NO. 1 BOREHOLE RECORD

BIT	FROM	TO
7 7/8"	120'	40'

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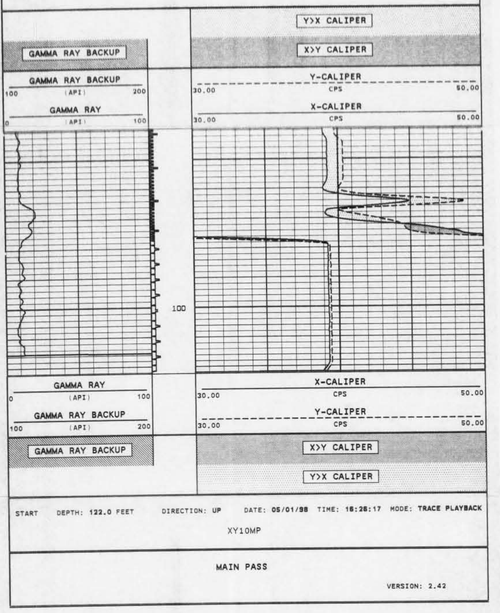
VERSION: 2.42

MAIN PASS

XY10MP

FINISH DEPTH: 38.2 FEET DIRECTION: UP DATE: 05/01/98 TIME: 16:28:50 MODE: TRACE PLAYBACK



START DEPTH: 122.0 FEET DIRECTION: UP DATE: 05/01/98 TIME: 16:28:17 MODE: TRACE PLAYBACK

XY10MP

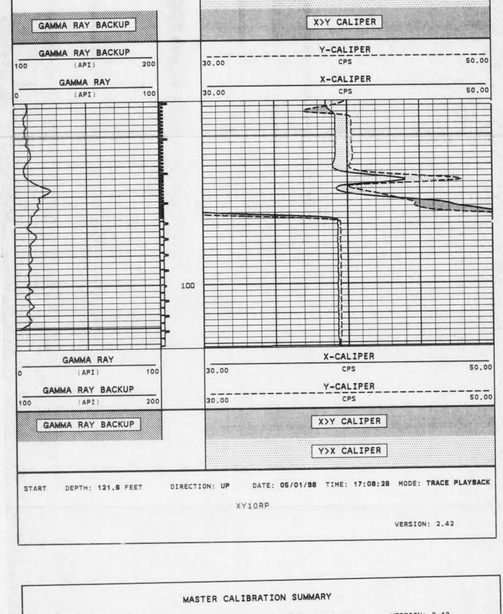
MAIN PASS

VERSION: 2.42

VERSION: 2.42

XY10RP

FINISH DEPTH: 43.4 FEET DIRECTION: UP DATE: 05/01/98 TIME: 17:08:57 MODE: TRACE PLAYBACK



START DEPTH: 121.6 FEET DIRECTION: UP DATE: 05/01/98 TIME: 17:08:28 MODE: TRACE PLAYBACK

XY10RP

VERSION: 2.42

MASTER CALIBRATION SUMMARY

FILE: DATE: 05/01/98 TIME: 11:26 VERSION: 2.42

GR API CAL #15

DATE: 11/20/97 TIME: 09:15

	MEASURED	UNITS	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
SHOP: BACKGROUND	49.2	CPS	0.0	31.8	60.8	5.83	API
SHOP: CALIBRATOR	179.0	CPS	120.0	131.0	207.8	12.94	API

BEFORE SURVEY CALIBRATION SUMMARY

FILE: DATE: 05/01/98 TIME: 11:25 VERSION: 2.42

X-CALIPER #01

DATE: 05/01/98 TIME: 10:32

	MEASURED	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
10"	7.5	10.0	7.4	7.7	0.12	CPS
20"	12.3	20.0	12.1	12.3	0.09	CPS
30"	17.1	30.0	16.9	17.3	0.09	CPS
40"	21.7	40.0	21.6	21.8	0.07	CPS
58"	29.7	60.0	29.6	29.8	0.00	CPS

Y-CALIPER #01

DATE: 05/01/98 TIME: 10:32

	MEASURED	STANDARD	MINIMUM	MAXIMUM	DEVIATION	UNITS
10"	7.6	10.0	7.3	7.8	0.13	CPS
20"	12.2	20.0	12.0	12.4	0.04	CPS
30"	16.7	30.0	16.7	16.9	0.04	CPS
40"	21.4	40.0	21.3	21.5	0.07	CPS
58"	29.5	60.0	29.4	29.6	0.07	CPS

COMPANY MIAMI DADE WATER & SEWER DEPT.

WELL N&WF #10

FIELD NORTH WEST WELL FIELD STATE FLORIDA

FLORIDA GEOPHYSICAL LOGGING, INC.

X-Y CALIPER GAMMA RAY LOG

Company	MIAMI DADE
Well	NW-#10
Field	N.W. WELL FIELD
Country	DADE
State/Prv	FLORIDA

Company MIAMI DADE
Well NW-#10
Field N.W. WELL FIELD
Country DADE State/Prv FLORIDA

Location | Other Services: NONE

Permanent Datum	PAD	Elevation 0'	Elevation K.B. D.F. G.L.
Log Measured From	PAD		
Drilling Measured From	PAD		

Date	9-FEB-98
Run Number	THREE
Depth Driller	170.5'
Depth Logger	170'
Bottom Logged Interval	165'
Top Log Interval	10'
Open Hole Size	46.5"
Type Fluid	MUD
Density / Viscosity	N/A
Max. Recorded Temp.	N/A
Estimated Cement Top	N/A
Time Well Ready	07:50
Time Logger on Bottom	08:00
Equipment Number	103
Location	FT MYERS
Recorded By	P.McHUGH
Witnessed By	R.RODRIGUEZ

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
THREE	46.5"	40'	60'				

	Size	Wgt/Ft	Top	Bottom
Casing Record	48"		SURF	40'
Surface String				
Prot. String				
Production String				
Liner				

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

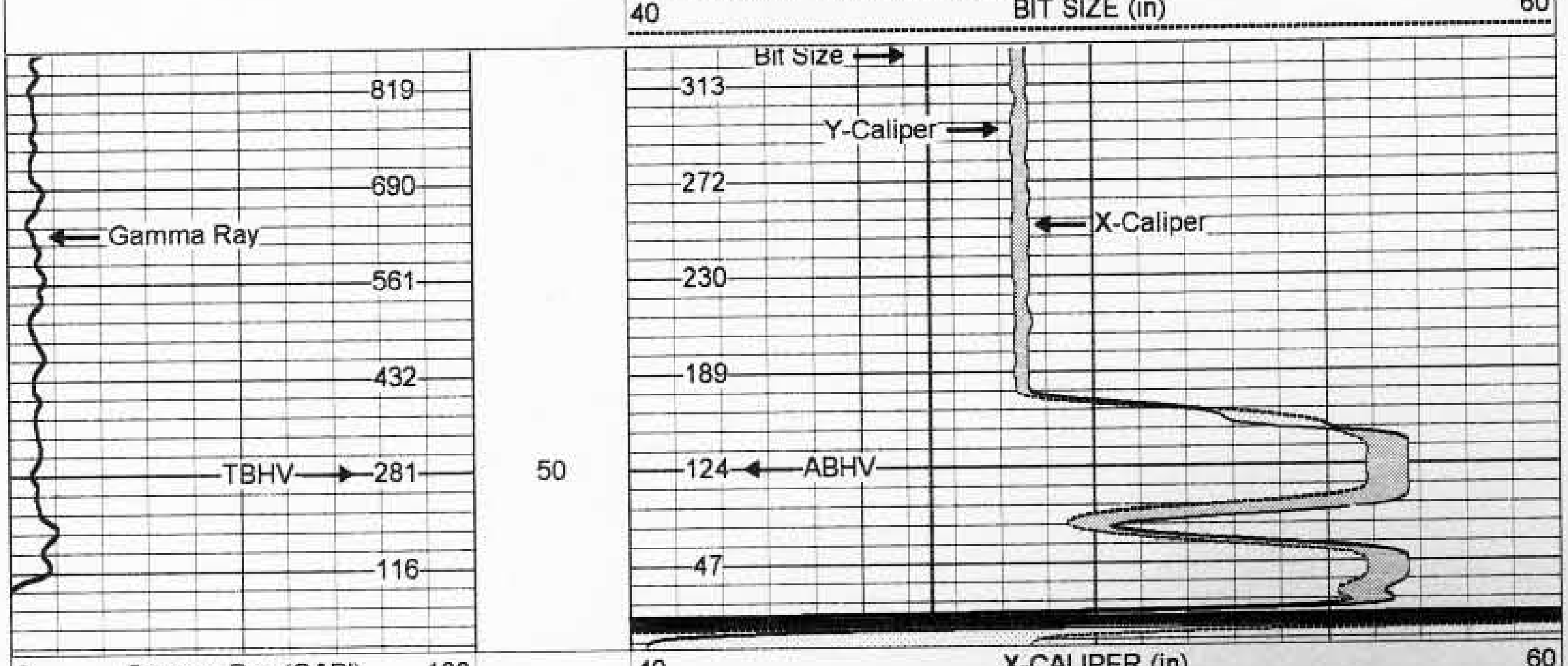
Comments

FUTURE CASING:
40"

FLORIDA GEOPHYSICAL LOGGING, INC. — MAIN PASS

Database File: nwwf10.db
Dataset Pathname: pass2
Presentation Format: grxyc.prs
Dataset Creation: Mon Feb 09 08:10:17 1998
Charted by: Depth in Feet scaled 1:240

0 Gamma Ray (GAPI) 100		40 X-CALIPER (in) 60
		40 Y-CALIPER (in) 60
		40 BIT SIZE (in) 60

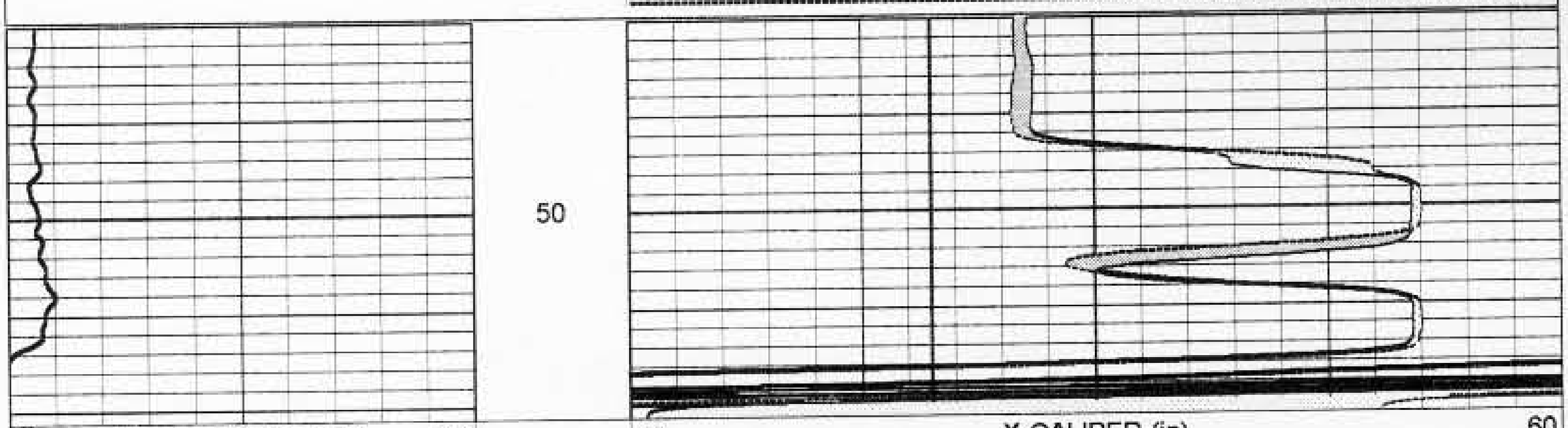


0 Gamma Ray (GAPI) 100		40 X-CALIPER (in) 60
		40 Y-CALIPER (in) 60
		40 BIT SIZE (in) 60

FLORIDA GEOPHYSICAL LOGGING, INC. — REPEAT PASS

Database File: nwwf10.db
Dataset Pathname: pass1.5
Presentation Format: grxyc.prs
Dataset Creation: Mon Feb 09 08:18:01 1998
Charted by: Depth in Feet scaled 1:240

0 Gamma Ray (GAPI) 100		40 X-CALIPER (in) 60
		40 Y-CALIPER (in) 60
		40 BIT SIZE (in) 60



0 Gamma Ray (GAPI) 100		40 X-CALIPER (in) 60
		40 Y-CALIPER (in) 60
		40 BIT SIZE (in) 60

Dataset: run1/pass2
Total Length: 9.35 ft
Total Weight: 127.00 lb
O.D. 3.50 in

XY Caliper Calibration Report

Serial Number/Model: 02LM-XYCLM
Performed: Mon Feb 09 07:51:31 1998

Ring			X Caliper		Y Caliper	
1:	30	in	991.892	cps	1027.13	cps
2:	40	in	1134.33	cps	1164.26	cps
3:	57	in	1382.78	cps	1397.9	cps
4:		in		cps		cps
5:		in		cps		cps
6:		in		cps		cps

Gamma Ray Calibration Report

Serial Number:	12	
Tool Model:	GROH	
Performed:	Tue Jan 13 16:03:22 1998	
Calibrator Value:	120	GAPI
Background Reading:	30.7752	cps
Calibrator Reading:	186.52	cps
Sensitivity:	0.770492	GAPI/cps

Appendix D

WELL COMPLETION REPORT

FORM 0124
Rev. 11/90

WELL PERMIT NO. _____
SFWMD WATER USE PERMIT NO. _____

Owner	Address	City	State	Zip
Miami Dade WSA	3575 Lejeune Road	Miami	FL	33146

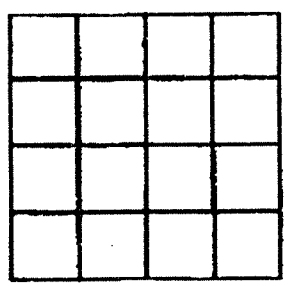
Contractor's Signature	License No.	Completion Date	Casing Depth	Total Depth	Well #
[signature]	2172	5/04/98	64'	104	NW #10

TYPE OF WORK: Construct ( ) Repair (X) Abandon ( )
WELL USE: Domestic Well ( ) Public ( ) Monitor (X) Test ( )
Irrigation ( ) Fire Well ( ) Other _____
METHOD: Rotary with MUD ( ), or Air (X), Cable Tool ( ), Jet ( )
Casing Driven ( ), Other _____
STATIC WATER LEVEL 8 Ft. below top of casing
PUMPING WATER LEVEL 30 Ft. after 12 Hrs. at 4500 GPM
PUMP SIZE _____ H.P. CAPACITY _____ GPM
PUMP TYPE _____ INTAKE DEPTH _____ From top of ground

LOCATION
Located Near 12 Ave NW
33rd St Miami, FL
County Dade

¼ ¼ Section Township Range

Latitude-Longitude



LOCATE IN SECTION

Cuttings sent to District? ( ) Yes (X) No

Note: PWS Wells attach a site map if well location is different from site location on permit application.

Grout Thickness & Depth	Casing & Screen Diameter & Depth		Depth (ft) From	Depth (ft) To	DRILL CUTTINGS LOG Examine cuttings every 20 ft. or at formation changes. Give color, grain size, and type of material. Note cavities, depth to producing zones.
4"	40"	.375	0	64	Black steel casing
			50	84	Limestone
			84	95	Sand 50%/Limestone
			95	98	Limestone/sand/shell
			98	121	Sand 90%/shell
			121	124	Clay
					Backfill well w/
					gravel/sand cap
					to 104' BLS
Number of bags					
1867					

Casing: Black Steel (X) Galv. ( ) PVC ( ) Fiberglass ( )
Screen: Type N/A Slot size —
Screened from — (ft.) to — (ft.)
Type of grout with % additives Neat Cement
Water: Clear ( ) Colored (X) Sulphur ( ) Salty ( ) Iron ( )
Conductivity _____ Chlorides _____ mg/l

Appendix E

Bacteriology Clearance Analyses

COVER SHEET

FAX

To: Mr. Joe De Marzio, Department of Health & Rehabilitative Services
Fax #: (305) 623-3620
Subject: Bacteriology Results for NW Well # 10.
Date: July 6, 1998
Pages: 1, including this cover sheet.

Date	Sample	MF	Analyst
06/30/98 9:00 A.M.	N W Well # 10	A	A.C. Salazar
06/30/98 3:00 P.M.	N W Well # 10	A	A.C. Salazar
07/01/98 7:30 P.M.	N W Well # 10	A	A.C. Salazar
07/01/98 2:00 P.M.	N W Well # 10	A	A.C. Salazar
07/02/98 7:30 A.M.	N W Well # 10	A	A.C. Salazar
07/02/98 1:30 P.M.	N W Well # 10	A	A.C. Salazar
07/03/98 7:30 A.M	N W Well # 10	A	A.C. Salazar
07/03/98 3:00 P.M.	N W Well # 10	A	A.C. Salazar
07/04/98 7:30 P.M..	N W Well # 10	A	A.C. Salazar
07/04/98 2:30 P.M.	N W Well # 10	A	A.C. Salazar
07/05/98 7:30 A.M.	N W Well # 10	A	A.C. Salazar
07/05/98 2:25 P.M.	N W Well # 10	A	A.C. Salazar

State of Florida Certification #56084

From the desk of...

Marjorie Jolly, Chemist 3
Preston Water Quality Laboratory

Miami-Dade Water & Sewer Department
1100 West 2 nd Avenue
Hialeah, Fl. 33010

Tel: (305) 887-2007
Fax: (305) 882-5767

C O V E R

S H E E T

FAX

To: Mr. Joe De Marzio, Department of Health & Rehabilitative Services
Fax #: (305) 623-3620
Subject: Bacteriology Results for NW Well # 10.
Date: July 13, 1998
Pages: 1, including this cover sheet.

Date	Sample	MF	Analyst
07/06/98 - 7:32 a.m.	N W Well # 10	A	A.C. Salazar
07/06/98 - 2:10 p.m.	N W Well # 10	A	A.C. Salazar
07/07/98 - 7:33 a.m.	N W Well # 10	A	A.C. Salazar
07/07/98 - 1:40 p.m.	N W Well # 10	A	A.C. Salazar
07/08/98 - 7:33 a.m.	N W Well # 10	A	A.C. Salazar
07/08/98 - 1:45 p.m.	N W Well # 10	A	A.C. Salazar
07/09/98 - 7:33 a.m.	N W Well # 10	A	A.C. Salazar
07/09/98 - 2:25 p.m.	N W Well # 10	A	A.C. Salazar

State of Florida Certification #56084

From the desk of...

Marjorie Jolly, Chemist 3
Preston Water Quality Laboratory

Miami-Dade Water & Sewer Department
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Hialeah, Fl. 33010

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Harbor Branch Water
Chemistry Results

HARBOR BRANCH ENVIRONMENTAL LABORATORY
5600 US 1 North, Fort Pierce, FL 34946
561-465-2400, Ext. 285

FDEP QAP 870174
September 23, 1998

Marjorie Jolly
Miami-Dade Water & Sewer Dept.
1100 West 2nd Avenue
Hialeah, FL 33010

Client : Metro Dade County
Project [Reference] : Groundwater Samples [8006175]
Date Received : August 26, 1998

Analytical results presented in this report have been reviewed for compliance with the laboratory quality assurance plan and applicable quality control criteria. The quality control parameters evaluated have been summarized on the Quality Control Summary page immediately following this cover sheet. Applicable quality control standards have been met unless otherwise noted on the Quality Control Summary page:

FDOH (HRS) Drinking Water Certification Number: 96230, 83486, 82500, 85512, 84526

FDOH (HRS) Environmental Certification Number: E96080, 83486, 82500, 85512, 84526

FDEP CompQAP Approval Number: 870174

NOTE: This document and the Quality Control Summary page are included as part of the Analytical Report for the above referenced project and should be retained as a permanent record thereof.

If you have any questions regarding this report, or if we can be of further assistance, please feel free to call (561) 465-2400 ext. 285 and ask to speak with a project manager.

Don Hash
Project Manager

N. Myron Gunsalus, Jr.
Laboratory Director

HARBOR BRANCH ENVIRONMENTAL LABORATORY
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561-465-2400, Ext. 285

FDEP QAP 870174

Quality Control Summary

- **Laboratory Blank:** All analytes were below Method Detection Limits (MDL).
- **Laboratory Control Sample/ Laboratory Control Sample Duplicate:** Recoveries for analytes were within laboratory precision and accuracy limits.
- **Matrix Spike/Matrix Spike Duplicate:** Recoveries for analytes were within laboratory precision and accuracy limits.
- **Sample Duplicate:** Analysis data demonstrated acceptable reproducibility of laboratory processes.

SM2150B:

HBEL Sample 8006175001 was received outside of the recommended hold time for Odor, therefore, the results for this analyte were obtained from a test that was performed past the holding time.

EPA 504.1:

For this method, the laboratory control sample and laboratory control sample duplicate were substituted for precision calculations for Dibromochloropropane.

EPA 625:

Precision for Dimethylphthalate was found to be outside of acceptance limits between the laboratory control sample and laboratory control sample duplicate. Due to lack of sample volume, no matrix spikes were performed. Accuracy recoveries were acceptable for both samples. This analyte was not detected in the sample. All other quality control measures were met.

EPA 200.9:

Due to high analyte concentrations and possible matrix interferences, the matrix spike and matrix spike duplicate samples for Lead and Selenium did not meet acceptable accuracy levels. For these analytes, the laboratory control samples were substituted. Antimony produced a result in the matrix spike duplicate sample that failed to meet accuracy limits. This resulted in precision also not meeting acceptable levels. Method performance was based on the matrix spike sample and laboratory control sample.

EPA 515:

Recoveries of Dalapon in the laboratory control sample and laboratory control sample duplicate were found to be somewhat low. Pentachlorophenol produced a result in the laboratory control sample duplicate that did not meet established acceptance limits. Accuracy was proven in the laboratory control sample. For both analytes, precision was determined to be acceptable.

Eric Charest
Quality Assurance Manager

PUBLIC DRINKING WATER ANALYSIS REPORTING FORMAT

PUBLIC WATER SYSTEM INFORMATION (to be completed by system or lab)

System Name: _____ I.D. #: _____

Address: _____ Phone #: _____

Type (check one): ( ) Community ( ) Nontransient Noncommunity ( ) Noncommunity

SAMPLE INFORMATION (to be completed by sampler)

Sample Date (MMDDYY): 08/25/98 Sample Time: 08:30

Sample Location (be specific): NW Well #10

Sampler Name and Phone: _____

Sampler's Signature: _____ Title: _____

Check Type(s):
( ) Distribution ( ) Recheck of MCL ( ) Resample of Lab Invalidated Sample
( ) Clearance ( ) Thm Max Res Time ( ) Plant Tap
( ) Distrib entry pt ( ) Raw ( ) Composite of Multiple Sites--Attach a format for each site

LABORATORY CERTIFICATION INFORMATION (to be completed by lab) -- **ATTACH HRS ANALYTE SHEET**

Lab Name: Harbor Branch Environmental Laboratory HRS #: 96230 Expiration Date: 06/30/99

Address: 5600 U.S. 1 North, Ft. Pierce, FL 34946 Phone # : (561) 465-2400 ext. 285

Subcontracted Lab HRS #: 84252 & 84269 Group Analyzed: EPA 548.1 & Gross Alpha

ANALYSIS INFORMATION (to be completed by lab) -- **SAMPLE NUMBER:** 8006175001

Date Sample(s) Received: 08/26/98 Group(s) Analyzed & Results attached for compliance with 62-550, F.A.C.:

( ) Nitrate Only	( ) Nitrite Only	( ) Asbestos Only	(X) Trihalomethanes
Inorganics-- ( ) All 17 (X) Partial	Volatile Organics-- (X) All 21 ( ) Partial	Secondaries-- (X) All 14 ( ) Partial	Pesticides & PCBs-- ( ) All (X) Partial
Group I Unregulateds-- ( ) All 13 (X) Partial	Group II Unregulateds-- (X) All 23 ( ) Partial	Group III Unregulateds-- (X) All 11 ( ) Partial	Radiochemical-- (X) Single Sample ( ) Qtrly Composite*

* Provide radiochemical sample dates & locations for each quarter

I, N. Myron Gunsalus, Jr., do HEREBY CERTIFY that all attached analytical data are correct.

Signature _____

Title Laboratory Director Date September 24, 1998

COMPLIANCE INFORMATION (to be completed by State)

Sample Collection Satisfactory: _____ Sample Analysis Satisfactory: _____

Resample Requested for: _____ Reason: _____

Person notified to resample: _____ Date Notified: _____

DER/HRS Reviewing Official: _____

HARBOR BRANCH ENVIRONMENTAL LABORATORY
5600 US 1 North, Fort Pierce, FL 34946
561-465-2400, Ext. 285

FDEP QAP 870174

INORGANICS ANALYSIS
62-550.310(1)
(PWS030)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	Nitric Acid, Sodium Hydroxide or None
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Parameter [MCL]	Result		Method	MDL	Date	Lab ID
1005	Arsenic[.05]	ND	mg/L	EPA 200.7	0.0032	08/27/98	96230
1010	Barium[2]	0.021	mg/L	EPA 200.7	0.0018	08/27/98	96230
1015	Cadmium[.005]	ND	mg/L	EPA 200.7	0.00070	08/27/98	96230
1020	Chromium[.1]	ND	mg/L	EPA 200.7	0.0018	08/27/98	96230
1024	Cyanide[.2]	0.031	mg/L	SM4500CN E	0.0040	08/27/98	96230
1025	Fluoride[4]	0.24	mg/L	EPA 300.0	0.011	08/26/98	96230
1030	Lead[.015]	0.0012	mg/L	EPA 200.9	0.0010	09/10/98	96230
1035	Mercury[.002]	ND	mg/L	EPA 245.1	0.000060	09/02/98	96230
1036	Nickel[.1]	ND	mg/L	EPA 200.7	0.0020	08/27/98	96230
1040	Nitrate[10]	ND	mg/L	EPA 300.0	0.0030	08/26/98	96230
1041	Nitrite[1]	ND	mg/L	EPA 300.0	0.0022	08/26/98	96230
1045	Selenium[.05]	ND	mg/L	EPA 200.9	0.0020	09/10/98	96230
1052	Sodium[160]	40	mg/L	EPA 200.7	0.50	08/27/98	96230
1074	Antimony[.006]	ND	mg/L	EPA 200.9	0.0010	09/10/98	96230
1075	Beryllium[.004]	ND	mg/L	EPA 200.7	0.0010	08/27/98	96230
1085	Thallium[.002]	ND	mg/L	EPA 200.9	0.0010	09/10/98	96230

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FDEP QAP 870174

TRIHALOMETHANE ANALYSIS
62-550.310(2)(a)
(PWS027)

Project	Metro Dade County	Workorder	Groundwater Samples
Sample Location	NW Well #10		
Sample Number	8006175001		
Sampling Date	08/25/98 08:30		
Preservative	Sodium Thiosulfate		
Date Received	08/26/98 09:45		

ID	Parameter [MCL]	CL Res.	Result		Method	MDL	Date	Lab ID
2950	Total THMs[.1]	_____	ND	mg/L	EPA 524.2	0.00050	09/01/98	96230

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FDEP QAP 870174

VOLATILE ORGANIC ANALYSIS
62-550.310(2)(b)
(PWS028)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	1:1 Hydrochloric Acid
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Parameter [MCL]	Result		Method	MDL	Date	Lab ID
2378	1,2,4-Trichlorobenzene[70]	ND	ug/L	EPA 524.2	0.37	09/01/98	96230
2380	cis-1,2-Dichloroethylene[70]	ND	ug/L	EPA 524.2	0.23	09/01/98	96230
2955	Total Xylenes[10000]	ND	ug/L	EPA 524.2	0.30	09/01/98	96230
2964	Dichloromethane[5]	ND	ug/L	EPA 524.2	0.49	09/01/98	96230
2968	o-Dichlorobenzene[600]	ND	ug/L	EPA 524.2	0.35	09/01/98	96230
2969	para-Dichlorobenzene[75]	ND	ug/L	EPA 524.2	0.28	09/01/98	96230
2976	Vinyl chloride[1]	ND	ug/L	EPA 524.2	0.33	09/01/98	96230
2977	1,1-Dichloroethylene[7]	ND	ug/L	EPA 524.2	0.21	09/01/98	96230
2979	trans-1,2-Dichloroethylene[100]	ND	ug/L	EPA 524.2	0.18	09/01/98	96230
2980	1,2-Dichloroethane[3]	ND	ug/L	EPA 524.2	0.45	09/01/98	96230
2981	1,1,1-Trichloroethane[200]	ND	ug/L	EPA 524.2	0.25	09/01/98	96230
2982	Carbon tetrachloride[3]	ND	ug/L	EPA 524.2	0.28	09/01/98	96230
2983	1,2-Dichloropropane[5]	ND	ug/L	EPA 524.2	0.23	09/01/98	96230
2984	Trichloroethylene[3]	ND	ug/L	EPA 524.2	0.21	09/01/98	96230
2985	1,1,2-Trichloroethane[5]	ND	ug/L	EPA 524.2	0.23	09/01/98	96230
2987	Tetrachloroethylene[3]	ND	ug/L	EPA 524.2	0.26	09/01/98	96230
2989	Monochlorobenzene[100]	ND	ug/L	EPA 524.2	0.23	09/01/98	96230
2990	Benzene[1]	ND	ug/L	EPA 524.2	0.090	09/01/98	96230
2991	Toluene[1000]	ND	ug/L	EPA 524.2	0.18	09/01/98	96230
2992	Ethylbenzene[700]	ND	ug/L	EPA 524.2	0.19	09/01/98	96230
2996	Styrene[100]	ND	ug/L	EPA 524.2	0.24	09/01/98	96230

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FDEP QAP 870174

PESTICIDE & PCB CHEMICAL ANALYSIS
62-550.310(2)(c)
(PWS029)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	Sodium Thiosulfate
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Parameter [MCL]	Result		Method	MDL	Date	Lab ID
2005	Endrin[2]	ND	ug/L	EPA 508	0.0061	08/27/98	96230
2010	Lindane[.2]	ND	ug/L	EPA 508	0.0040	08/27/98	96230
2015	Methoxychlor[40]	ND	ug/L	EPA 508	0.0040	08/27/98	96230
2020	Toxaphene[3]	ND	ug/L	EPA 508	1.2	08/27/98	96230
2031	Dalapon[200]	ND	ug/L	EPA 515.1	0.66	08/31/98	96230
2032	Diquat[20]	ND	ug/L	EPA 549.1	0.88	09/01/98	96230
2033	Endothall[100]	ND	ug/L	EPA 548.1	10	08/28/98	84269
2034	Glyphosate[700]	ND	ug/L	EPA 547	6.0	08/29/98	96230
2035	Di(2-ethylhexyl)adipate[400]	ND	ug/L	EPA 525	0.81	08/31/98	96230
2036	Oxamyl (Vydate)[200]	ND	ug/L	EPA 531.1	0.36	08/28/98	96230
2037	Simazine[4]	ND	ug/L	EPA 507	0.33	08/27/98	96230
2039	Di(2-ethylhexyl)phthalate[6]	ND	ug/L	EPA 525	1.4	08/31/98	96230
2040	Picloram[500]	ND	ug/L	EPA 515.1	0.085	08/31/98	96230
2041	Dinoseb[7]	ND	ug/L	EPA 515.1	1.0	08/31/98	96230
2042	Hexachlorocyclopentadiene[50]	ND	ug/L	EPA 508	0.071	08/27/98	96230
2046	Carbofuran[40]	ND	ug/L	EPA 531.1	0.21	08/28/98	96230
2050	Atrazine[3]	ND	ug/L	EPA 507	0.24	08/27/98	96230
2051	Alachlor[2]	ND	ug/L	EPA 507	0.29	08/27/98	96230
2065	Heptachlor[.4]	ND	ug/L	EPA 508	0.0051	08/27/98	96230
2067	Heptachlor epoxide[.2]	ND	ug/L	EPA 508	0.0040	08/27/98	96230
2105	2,4-D[70]	ND	ug/L	EPA 515.1	0.32	08/31/98	96230
2110	2,4,5-TP (Silvex)[50]	ND	ug/L	EPA 515.1	0.11	08/31/98	96230
2274	Hexachlorobenzene[1]	ND	ug/L	EPA 508	0.019	08/27/98	96230
2306	Benzo(a)pyrene[.2]	ND	ug/L	EPA 525	0.072	08/31/98	96230
2326	Pentachlorophenol[1]	ND	ug/L	EPA 515.1	0.18	08/31/98	96230
2383	PCB[.5]	ND	ug/L	EPA 508	0.25	08/27/98	96230
2931	Dibromochloropropane[.2]	ND	ug/L	EPA 504.1	0.0025	09/02/98	96230
2946	Ethylene dibromide[.02]	ND	ug/L	EPA 504.1	0.0027	09/02/98	96230
2959	Chlordane[2]	ND	ug/L	EPA 508	0.012	08/27/98	96230

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FDEP QAP 870174

RADIOCHEMICAL ANALYSIS
62-550.310(5)
(PWS033)

Project	Metro Dade County	Workorder	Groundwater Samples
Sample Location	NW Well #10		
Sample Number	8006175001		
Sampling Date	08/25/98 08:30		
Preservative	Nitric Acid		
Date Received	08/26/98 09:45		

ID	Name	Result (pCi/L)		Method	Error	Date	Lab ID
4000	Gross Alpha	2.8	pCi/L	EPA 900.0	+/-1.0	09/01/98	8-252

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FDEP QAP 870174

SECONDARY CHEMICAL ANALYSIS
62-550.320
(PWS031)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	Nitric Acid or None
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Parameter [MCL]	Result		Method	MDL	Date	Lab ID
1002	Aluminum[.2]	ND	mg/L	EPA 200.7	0.030	08/27/98	96230
1017	Chloride[250]	63	mg/L	EPA 300.0	5.0	09/01/98	96230
1022	Copper[1]	ND	mg/L	EPA 200.7	0.0014	08/27/98	96230
1025.	Fluoride.[2]	0.24	mg/L	EPA 300.0	0.011	08/26/98	96230
1028	Iron[.3]	1.0	mg/L	EPA 200.7	0.025	08/27/98	96230
1032	Manganese[.05]	0.013	mg/L	EPA 200.7	0.0038	08/27/98	96230
1050	Silver[.1]	ND	mg/L	EPA 200.7	0.0010	08/27/98	96230
1055	Sulfate[250]	ND	mg/L	EPA 300.0	1.4	09/01/98	96230
1095	Zinc[5]	ND	mg/L	EPA 200.7	0.050	08/27/98	96230
1905	Color[15]	90	CU	SM2120 B	20	08/26/98	96230
1920	Odor[3]	2.4	T.O.N.	SM2150 B	1.0	08/26/98	96230
1925	pH[]	8.1	SU	EPA 150.1	0.20	09/01/98	96230
1930	Total Dissolved Solids[500]	360	mg/L	SM2540 C	5.0	08/27/98	96230
2905	Foaming Agents[.5]	0.13	mg/L	SM5540 C	0.019	08/26/98	96230

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FDEP QAP 870174

UNREGULATED GROUP I ANALYSIS
62-550.405
(PWS035)

Project	Metro Dade County	Workorder	Groundwater Samples
Sample Location	NW Well #10		
Sample Number	8006175001		
Sampling Date	08/25/98 08:30		
Preservative	Sodium Thiosulfate & Monochloroacetic Acid Buffer		
Date Received	08/26/98 09:45		

ID	Name	Result		Method	MDL	Date	Lab ID
2021	Carbaryl	ND	ug/L	EPA 531.1	0.25	08/28/98	96230
2022	Methomyl	ND	ug/L	EPA 531.1	0.23	08/28/98	96230
2043	Aldicarb sulfoxide	ND	ug/L	EPA 531.1	0.23	08/28/98	96230
2044	Aldicarb sulfone	ND	ug/L	EPA 531.1	0.35	08/28/98	96230
2045	Metolachlor	ND	ug/L	EPA 507	0.58	08/27/98	96230
2047	Aldicarb	ND	ug/L	EPA 531.1	0.27	08/28/98	96230
2066	3-Hydroxycarbofuran	ND	ug/L	EPA 531.1	0.25	08/28/98	96230
2077	Propachlor	ND	ug/L	EPA 508	0.0069	08/27/98	96230
2356	Aldrin	ND	ug/L	EPA 508	0.011	08/27/98	96230
2364	Dieldrin	ND	ug/L	EPA 508	0.0040	08/27/98	96230
2440	Dicamba	ND	ug/L	EPA 515.1	0.12	08/31/98	96230
2592	Metribuzin	ND	ug/L	EPA 507	0.11	08/27/98	96230

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FDEP QAP 870174

UNREGULATED GROUP II ANALYSIS
62-550.410
(PWS034)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	1:1 Hydrochloric Acid
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Name	Result		Method	MDL	Date	Lab ID
2210	Chloromethane	ND	ug/L	EPA 524.2	0.43	09/01/98	96230
2212	Dichlorodifluoromethane	ND	ug/L	EPA 524.2	0.49	09/01/98	96230
2214	Bromomethane	ND	ug/L	EPA 524.2	0.41	09/01/98	96230
2216	Chloroethane	ND	ug/L	EPA 524.2	0.42	09/01/98	96230
2218	Trichlorofluoromethane	ND	ug/L	EPA 524.2	0.20	09/01/98	96230
2251	Methyl-tert-butyl-ether	ND	ug/L	EPA 524.2	0.24	09/01/98	96230
2408	Dibromomethane	ND	ug/L	EPA 524.2	0.41	09/01/98	96230
2410	1,1-Dichloropropylene	ND	ug/L	EPA 524.2	0.10	09/01/98	96230
2412	1,3-Dichloropropane	ND	ug/L	EPA 524.2	0.30	09/01/98	96230
2413	1,3-Dichloropropene	ND	ug/L	EPA 524.2	0.30	09/01/98	96230
2414	1,2,3-Trichloropropane	ND	ug/L	EPA 524.2	0.26	09/01/98	96230
2416	2,2-Dichloropropane	ND	ug/L	EPA 524.2	0.47	09/01/98	96230
2941	Chloroform	ND	mg/L	EPA 524.2	0.00018	09/01/98	96230
2942	Bromoform	ND	mg/L	EPA 524.2	0.00048	09/01/98	96230
2943	Bromodichloromethane	ND	mg/L	EPA 524.2	0.00027	09/01/98	96230
2944	Dibromochloromethane	ND	mg/L	EPA 524.2	0.00040	09/01/98	96230
2965	o-Chlorotoluene	ND	ug/L	EPA 524.2	0.18	09/01/98	96230
2966	p-Chlorotoluene	ND	ug/L	EPA 524.2	0.16	09/01/98	96230
2967	m-Dichlorobenzene	ND	ug/L	EPA 524.2	0.22	09/01/98	96230
2978	1,1-Dichloroethane	ND	ug/L	EPA 524.2	0.11	09/01/98	96230
2986	1,1,1,2-Tetrachloroethane	ND	ug/L	EPA 524.2	0.15	09/01/98	96230
2988	1,1,2,2-Tetrachloroethane	ND	ug/L	EPA 524.2	0.39	09/01/98	96230
2993	Bromobenzene	ND	ug/L	EPA 524.2	0.20	09/01/98	96230

HARBOR BRANCH ENVIRONMENTAL LABORATORY
5600 US 1 North, Fort Pierce, FL 34946
561-465-2400, Ext. 285

FDEP QAP 870174

UNREGULATED GROUP III ANALYSIS
62-550.415
(PWS036 & 037)

Project	Metro Dade County
Sample Location	NW Well #10
Sample Number	8006175001
Sampling Date	08/25/98 08:30
Preservative	None
Date Received	08/26/98 09:45

Workorder Groundwater Samples

ID	Name	Result		Method	MDL	Date	Lab ID
2262	Isophorone	ND	ug/L	EPA 625	0.42	08/31/98	96230
2270	2,4-Dinitrotoluene	ND	ug/L	EPA 625	0.75	08/31/98	96230
2282	Dimethylphthalate	ND	ug/L	EPA 625	2.4	08/31/98	96230
2284	Diethylphthalate	ND	ug/L	EPA 625	0.35	08/31/98	96230
2290	Di-n-butylphthalate	ND	ug/L	EPA 625	0.74	08/31/98	96230
2294	Butyl benzyl phthalate	ND	ug/L	EPA 625	0.55	08/31/98	96230
9089	Di-n-octylphthalate	ND	ug/L	EPA 625	0.51	08/31/98	96230
9108	2-Chlorophenol	ND	ug/L	EPA 625	0.84	08/31/98	96230
9112	2-Methyl-4,6-dinitrophenol	ND	ug/L	EPA 625	1.2	08/31/98	96230
9115	Phenol	ND	ug/L	EPA 625	0.97	08/31/98	96230
9116	2,4,6-Trichlorophenol	ND	ug/L	EPA 625	1.1	08/31/98	96230

Southern Analytical
Project No. 14400
September 11, 1998

HBEL No. 8006175-001

PESTICIDE & PCB CHEMICAL ANALYSIS
62-550.310(2) (c)
(PWS029)

Parameter ID	NAME (MCL µg/l)	Sample Number	Analysis Result (µg/l)	Analysis Method	Analysis Date	MDL	Lab ID
2005	Endothall (100)	14400-03	10 U	EPA 548.1	8/28/98	10	84269

U - Analyte was not detected; indicated concentration is method detection limit.

Appendix F

Laboratory Results
August 24, 1998

MONTGOMERY WATSON LABORATORIES

555 East Walnut Street
Pasadena, California 91101
818 568 4806; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Miami Dade Water and Sewer
Authority Dept.
6800 S.W. 87th Avenue

Miami , FL 33173

Attention: Ray Diaz
Fax: (305) 275-3662

MONTGOMERY WATSON LABS.
SUBMITTED ON
AUG 28 1998
JCH Jim Hein

Report#: 46571
ICR

MONTGOMERY WATSON LABORATORIES
[illegible] East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report #46571

Miami Dade Water and Sewer Authority Dept.
Ray Diaz
6800 S.W. 87th Avenue
Miami , FL 33173

Samples Received
26-aug-1998 15:19:44

NORTHWEST WELL 10 (980826094) **Sampled on 08/24/98**

Microscopic Particulate Analy.

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	08/26/98		ML/EPA	Amoeba Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Relative Risk Factor, Coccidia	0	RRF	0.0000	1
	08/26/98		ML/EPA	Ciliate/Flagellate Quant.	<1	100G	1.0	1
	08/26/98		SM 9711B	Coccidia/Crypto(w int struct)	<1	100G	1.0	1
	08/26/98		ML/EPA	Crustacea Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Diatoms Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Dipteran Larvae Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Fine Amorphous Debris Quant.	>200	100G	1.0	1
	08/26/98		ML/EPA	Fungal Spore Quant.	<1	100G	1.0	1
	08/26/98		SM 9711B	Giardia Cysts-Presumptive	<1	100G	1.0	1
	08/26/98		ML/EPA	Relative Risk Factor, Giardia	0	RRF	0.0000	1
	08/26/98		ML/EPA	Insect Parts and Larvae Quant	<1	100G	1.0	1
	08/26/98		ML/EPA	Large Amorphous Debris Quant.	>200	100G	1.0	1
	08/26/98		ML/EPA	Minerals Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Miscellaneous Algae Quant.	5	100G	1.0	1
	08/26/98		ML/EPA	Mites Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Nematode Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Plant Debris Quant.	1	100G	1.0	1
	08/26/98		ML/EPA	Plant Pollen Quant.	1	100G	1.0	1
	08/26/98		ML/EPA	Rotifers Quant.	<1	100G	1.0	1
	08/26/98		ML/EPA	Other Debris-See Comments	<1	100G	1.0	1
	08/26/98		ML/EPA	Diatoms, Rel.Risk Factor	0	RRF	0.0000	1
	08/26/98		ML/EPA	Insect Parts/Larv.Rel.Risk F	0	RRF	0.0000	1
	08/26/98		ML/EPA	Misc.Algae, Rel.Risk Factor	0	RRF	0.0000	1
	08/26/98		ML/EPA	Plant Debris.Rel.Risk Factor	0	RRF	0.0000	1
	08/26/98		ML/EPA	Rotifers, Rel.Risk Factor	0	RRF	0.0000	1
	08/26/98		ML/EPA	Relative Risk Factor, TOTAL	0	RRF	0.0000	1

MONTGOMERY WATSON LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Report
Comments
#46571

(980826094)
@MPA
Sample is at low risk of surface water contamination.

24 - 24 + 7 = 55 - 3 : 32

Montgomery Watson Laboratories

EPA RELATIVE SURFACE WATER RISK FACTORS

Client:	Miami Dade Water and Sewer
Water Source:	NORTHWEST WELL 10
Lab ID#	980826094
Volume Sampled:	760
Filter Setup Date:	8/24/98 ✓
Filter Setup Time:	3:58 PM ✓
Analysis Date:	8/26/98
Analysis Time:	11:00 PM

Weather Conditions:			
At Setup:	☐ Clear	☒ Cloudy	☐ Raining
A Finish:	☒ Clear	☐ Cloudy	☐ Raining
Site Conditions:			
At Setup:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded
A Finish:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded

Primary Particulates	#/100 Gallon	Relative Frequency**	Relative Risk Factor	Comments
Giardia with internal structures	<1	NS	0	
Coccidia with internal structures	<1	NS	0	
Diatoms	<1	NS	0	
Other Algae	5	R	4	
Insects/larvae	<1	NS	0	
Rotifers	<1	NS	0	
Plant Debris (with chlorophyll)	1	R	0	
		Relative Risk Factor	4	** Extremely Heavy, Heavy, Moderate, Rare, Not Significant

Secondary Particulates	#/100 Gallon	Relative Frequency	Relative Risk Factor	Comments
Nematodes	<1	NS	no risk factor	
Crustaceans	<1	NS	no risk factor	
Fungal Spores	<1	NS	no risk factor	
Amoebae	<1	NS	no risk factor	
Flagellates & Ciliates	<1	NS	no risk factor	
Plant Pollen	1	R	no risk factor	
Other: Large Amorphous Debris	>200	EH	no risk factor	
Other: Fine Amorphous Debris	>200	EH	no risk factor	
Other: Minerals Quant.	<1	NS	no risk factor	
Other: Other Debris	<1	NS	no risk factor	

COMMENTS: Primary surface water indicators observed: **Other Algae Plant Debris (with chlorophyll)**
Based upon microscopic particulate analysis and the proposed EPA risk factors associated with bio-Indicators there is low risk of surface contamination (EPA risk factors <9, low risk)

REFERENCE: Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA), USEPA Manchester Environmental Laboratory, EPA 910/9-92-092, October 1992.

Reviewed by: James C. Hsu **Date: 4/23/99**

FLORIDA DEPARTMENT OF HEALTH

MPA SAMPLE REPORT

Lab Sample # E98-775 **Utility:** PWS # 4130871 Miami Dade Water & Sewer well #10

Date/time Collected 08/24/98 03:58 PM 08/25/98 07:45 AM **Date/time Processed:** 08/26/98 10:20 AM **By:** Larson/Cashdollar

PROCESSING INFORMATION

filter color	light brown	color of water around the filter:	light brown
Total volume water filtered (gal):	710	Percoll/sucrose flotation pellet volume (µl):	17.1
Total volume filter sediment (µl):	232	Percoll/sucrose flotation packed sediment (µl):	100
µl sediment/100 gallons sampled:	32.7	µl flotation pellet volume/100 gallons sampled:	2.4
number of slides examined:	2	material examined:	floated (suspended) pellet

Primary Particulates	#/100 gallon	Relative frequency*	Relative Risk Factor*	Comments
Giardia	NA			
Coccidia	NA			
Diatoms (with chloroplasts)	0	NS	0	
Other Algae (with chloroplasts)	30.6	M	9	some euglenoids
Insects / Larvae	0	NS	0	
Rotifers	0	NS	0	
Plant Debris	0	NS	0	
Other				

EPA Relative Risk= 9

*Reference: USEPA Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA):

NA = Not Assayed
EH = extremely heavy H = heavy M = moderately heavy R = rare NF = None found

Secondary Particulates	#/100 gallon	Comments
Large amorphous debris	R	
Fine amorphous debris	H	
Minerals	M	
Plant pollen	10.1	
Nematodes	0	
Crustaceans	0	
Amoeba	4.2	
Flagellates & ciliates	0.8	
Other: eggs	0	
Other: fungal filaments & spores	R	

Comments: Entire floated pellet examined. One slide of the packed pellet from the floatation tube was also examined; it contained rare algae, but no other indicator organisms.

Based upon microscopic particulate analysis and the EPA risk factors associated with bio-indicators, there is a low risk of surface contamination. Determination of surface water influence should not be based solely on the results of one or two MPAs. Other pertinent information, such as water quality data and on-site surveys, should be used in conjunction with the MPA results in making this determination.

Reported by: Gillian M. Stark Date: 08/28/98

Lawton Chiles, Governor
Tampa Branch Laboratory
3952 West Dr. Martin Luther King Jr. Boulevard • Tampa, FL 33614-8404
Fax: (813)871-7468 Phone:(813)871-7465 Suncom: 512-6278
James T. Howell, M.D., M.P.H., Secretary

E98- 0775

MPA SOURCE WATER IDENTIFICATION
STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871

community ✓ non-transient non-community ___ non-community ___

NAME OF WATER SYSTEM AND ADDRESS: Miami Dade Water and Sewer Dept. 1100 West 2nd Ave. Hialeah, FL. 33010 PHONE (305) 887-2007

SAMPLER NAME AND ADDRESS: David Ramos - 4180 West 10 ct. Hialeah, FL. 33012 PHONE (305) 829-8611

LAB NAME AND ADDRESS: John E. Preston Water Quality Lab. 1100 W. 2nd Ave. Hialeah, FL. 33010 PHONE (305) 887-2007

NAME OF ANALYST ___ PROJECT CODE # ___ ACCOUNT#: ___

NAME OF CARRIER AND TRACKING NUMBER: Fed Ex, # 803742289249

DATE SAMPLE RECEIVED BY LABORATORY: 8/26/98 10:10am

NAME OF PERSON RECEIVING SAMPLES INTO THE LABORATORY: Rita Lasser

WAS PACKING AND EVIDENCE TAPE INTACT? yes

TEMPERATURE OF SAMPLES AT RECEIPT: 17°C

DATE AND TIME THE FILTER WAS REMOVED FROM THE HOUSING (IN THE FIELD): 08/25/98 - 7:45am

DATE AND TIME SAMPLE PROCESSING BEGAN: ~~08/24/98~~ 8/26/98, 10:20am

Field information

Water source location: N.W. Wellfield (use latitude and longitude coordinates if available)

Type: well **Well ID #:** 10

Were wells pumped constantly or cycled on and off on a regular basis for at least two weeks prior to MPA sampling? Yes ✓ No ___

Volume of water purged from well prior to sampling ___

Depth of well: ___ (ft bls) Depth of casing: ___ (ft bls) Screened Interval: ___ (ft bls)

Is the well grouted? ___ Grouted Interval: ___ (ft bls)

Distance from other wells (within a 1500 foot radius), status of wells (active, inactive), and usage of wells ___

Distance from surface water bodies (indicate whether river, canal, stream, lake, pond, etc.: ___

Distance from any karst features (identify feature e.g. sinkholes): ___

Distance from any pollution sources (indicate types, e.g. septic tanks) ___

Time since last rainfall event, and amount of rainfall in inches (best approximation) 08/23/98 - 0.01 inches

****

Attach a detailed sketch of the site. This should include approximate distances to other well(s) and nearby features (i.e. water bodies, sinkholes, pollution sources or other pertinent landmarks) within a 1500 foot radius. Wherever possible provide a statement of the status and usage of any wells within this area. In addition, when available, attach a log of rainfall events and approximate amounts at the well site starting two weeks prior to the site visit.

****

Page two

MPA SOURCE WATER IDENTIFICATION, STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871 Well# 10

Measurements

Meter Reading Final: 23850 Time: 745am Date: 08/25/98
Well Turbidity Final: 0.25 Time: 9:45 Date: 08/25/98
Well Water Temperature Final: — Time: — Date: —
Well pH Final: — Time: — Date: —
Well Conductivity Final: — Time: — Date: —
Well Chlorine Residual Final: 0.00 Time: 9:48 Date: 08/25/98
Total Chlorine Final: 0.00 Time: 9:48 Date: —
Meter Reading Start: 23140 Time: 1558 Date: 08/24/98
Well Turbidity Start: 0.31 Time: 1558 Date: 08/24/98
Well Water Temperature Start: — Time: — Date: —
Well pH Start: — Time: — Date: —
Well Conductivity Start: — Time: — Date: —
Well Chlorine Residual Start: 0.00 Time: 1558 Date: 08/24/98
Total Chlorine Start: 0.00 Time: 1558 Date: 08/25/98
TOTAL WATER VOLUME FILTERED (in gallons): 710

****

Signatures of People Present at Time of Sampling: Amanda C. [illegible]
David Kaun

****

Processing Information:

Total volume filtered: 710 gal.
Total filter sediment collected: 232 uL
uL sediment/100 gal 32.68
Percoll@/sucrose floatation pellet volume: 17.1 uL
Percoll@/sucrose floatation packed sediment 100 uL
uL floatation pellet volume/100 gallons filtered 2.41 uL

Type of material examined:
___ direct examination of unfloated sediment by wet mount or filtered thru MF
_✓_ floated (suspended) pellet
___ floated packed pellet

Floatation Parameters:
_✓_ Percoll@/sucrose gradient
___ sucrose gradient
___ potassium citrate
___ %NSO4

MPA CLASSIFICATION AND QUANTITATION OF PARTICULATES

Sample #: E98-775 Dilution: 1:2 Vol. final pellet (µl): 40ul

Gallons water examined: 710 gallons Entire floated / unfloated pellet examined: yes / no

Slide #:	1 ☒ 8/27/98 400X	2 ☒ 8/27/98 400X	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Total count	#/100 gallons	Relative frequency	Risk Factor
Primary Particulates														
Giardia	—	—									0	0	NS	0
Coccidia	—	—									217	30.56	M	9
Diatoms	0	0									0	0	NS	0
Other algae	112*	105									0	0	NS	0
Insect/larvae	0	0									0	0	NS	0
Rotifers	0	0									0	0	NS	0
Plant debris	0	0									0	0	NS	0
other	0	0												19=C
Secondary particulates														
Large amorphous debris	R	R									R	R		
Fine amorphous debris	H	H									H	H		
Minerals	M	M									M	M		
Plant pollen	43	29									72	10.14		
Nematodes	0	0									0	0		
Crustacia	0	0									0	0		
Amoeba	8	22									30	4.22		
Ciliate/ Flagellates	1	5									6	0.84		
Other: Eggs	0	0									0	0		
Fungal filaments & spores	R	R									R	R		

no other 1° organism in pellet

Laboratory Results
September 1998

MONTGOMERY WATSON LABORATORIES

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Miami Dade Water and Sewer
Authority Dept.
6800 S.W. 87th Avenue

Miami , FL 33173

Attention: Ray Diaz
Fax: (305) 275-3662

MONTGOMERY WATSON LABS.
SUBMITTED ON
SEP 14 1998
JCH Jim Hein

Report#: 46970
ICR

MONTGOMERY WATSON LABORATORIES

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 568 LABS (1 800 568 5227)

Laboratory Report #46970

Miami Dade Water and Sewer Authority Dept.
Ray Diaz
6800 S.W. 87th Avenue
Miami , FL 33173

Samples Received

10-sep-1998 14:29:58

NORTHWEST WELL 10 (980910093) Sampled on 09/09/98

Microscopic Particulate Analy.

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	09/10/98		(ML/EPA)	Amoeba Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Relative Risk Factor, Coccidia	0	RRF	0.0000	1
	09/10/98		(ML/EPA)	Ciliate/Flagellate Quant.	<1	100G	1.0	1
	09/10/98		(SM 9711B)	Coccidia/Crypto(w int struct)	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Crustacea Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Diatoms Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Dipteran Larvae Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Fine Amorphous Debris Quant.	>200	100G	1.0	1
	09/10/98		(ML/EPA)	Fungal Spore Quant.	13	100G	1.0	1
	09/10/98		(SM 9711B)	Giardia Cysts-Presumptive	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Relative Risk Factor, Giardia	0	RRF	0.0000	1
	09/10/98		(ML/EPA)	Insect Parts and Larvae Quant	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Large Amorphous Debris Quant.	>200	100G	1.0	1
	09/10/98		(ML/EPA)	Minerals Quant.	>200	100G	1.0	1
	09/10/98		(ML/EPA)	Miscellaneous Algae Quant.	1	100G	1.0	1
	09/10/98		(ML/EPA)	Mites Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Nematode Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Plant Debris Quant.	42	100G	1.0	1
	09/10/98		(ML/EPA)	Plant Pollen Quant.	>200	100G	1.0	1
	09/10/98		(ML/EPA)	Rotifers Quant.	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Other Debris-See Comments	<1	100G	1.0	1
	09/10/98		(ML/EPA)	Diatoms, Rel.Risk Factor	0	RRF	0.0000	1
	09/10/98		(ML/EPA)	Insect Parts/Larv,Rel.Risk F	0	RRF	0.0000	1
	09/10/98		(ML/EPA)	Misc.Algae, Rel.Risk Factor	4	RRF	0.0000	1
	09/10/98		(ML/EPA)	Plant Debris,Rel.Risk Factor	1	RRF	0.0000	1
	09/10/98		(ML/EPA)	Rotifers, Rel.Risk Factor	0	RRF	0.0000	1
	09/10/98		(ML/EPA)	Relative Risk Factor, TOTAL	5	RRF	0.0000	1

MONTGOMERY WATSON LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400: Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Report
Comments
#46970

(980910093)
@MPA
Sample is at low risk of surface water contamination.

24+24+7: 55-3=52

Montgomery Watson Laboratories

EPA RELATIVE SURFACE WATER RISK FACTORS

Client:	Miami Dade Water and Sewer
Water Source:	NORTHWEST WELL 10
Lab ID#	980910093
Volume Sampled:	970
Filter Setup Date:	9/8/98 ✓
Filter Setup Time:	4:10 PM ✓
Analysis Date:	9/10/98
Analysis Time:	11:00 PM

Weather Conditions:			
At Setup:	☐ Clear	☒ Cloudy	☐ Raining
A Finish:	☐ Clear	☒ Cloudy	☐ Raining
Site Conditions:			
At Setup:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded
A Finish:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded

Primary Particulates	#/100 Gallon	Relative Frequency**	Relative Risk Factor	Comments
Giardia with internal structures	<1	NS	0	
Coccidia with internal structures	<1	NS	0	
Diatoms	<1	NS	0	
Other Algae	1	R	4	
Insects/larvae	<1	NS	0	
Rotifers	<1	NS	0	
Plant Debris (with chlorophyll)	42	M	1	
		Relative Risk Factor	5	** Extremely Heavy, Heavy, Moderate, Rare, Not Significant

Secondary Particulates	#/100 Gallon	Relative Frequency	Relative Risk Factor	Comments
Nematodes	<1	NS	no risk factor	
Crustaceans	<1	NS	no risk factor	
Fungal Spores	13	R	no risk factor	
Amoebae	<1	NS	no risk factor	
Flagellates & Ciliates	<1	NS	no risk factor	
Plant Pollen	>200	EH	no risk factor	
Other: Large Amorphous Debris	>200	EH	no risk factor	
Other: Fine Amorphous Debris	>200	EH	no risk factor	
Other: Minerals Quant.	>200	EH	no risk factor	
Other: Other Debris	<1	NS	no risk factor	

COMMENTS: Primary surface water indicators observed: **Other Algae Plant Debris (with chlorophyll)**
Based upon microscopic particulate analysis and the proposed EPA risk factors associated with bio-Indicators there is low risk of surface contamination (EPA risk factors <9, low risk)

REFERENCE: Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA), USEPA Manchester Environmental Laboratory, EPA 910/9-92-092, October 1992.

Reviewed by: James C. Hsu **Date: 4/23/99**

FLORIDA DEPARTMENT OF HEALTH

MPA SAMPLE REPORT

Lab Sample # E98-818 **Utility:** PWS# 4130871 Miami Dade Water & Sewer well #10

Date/time Collected 09/08/98 04:10 PM, 09/09/98 08:57 AM **Date/time Processed:** 09/10/98 11:00 AM **By:** Larson/Kazanis

PROCESSING INFORMATION

filter color: brown; color of water around the filter: light brown with white particles

Total volume water filtered (gal):	760	Percoll/sucrose flotation pellet volume (µl):	14.2
Total volume filter sediment (µl):	200.7	Percoll/sucrose flotation packed sediment (µl):	200
µl sediment/100 gallons sampled:	26.4	µl flotation pellet volume/100 gallons sampled:	1.9

number of slides examined: 2 material examined: floated (suspended) pellet

Primary Particulates	#/100 gallon	Relative frequency*	Relative Risk Factor*	Comments
Giardia	NA			
Coccidia	NA			
Diatoms (with chloroplasts)	0	NS	0	
Other Algae (with chloroplasts)	14.1	R	4	
Insects / Larvae	0	NS	0	
Rotifers	0	NS	0	
Plant Debris	0	NS	0	
Other				

EPA Relative Risk= 4

*Reference: USEPA Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA): NA = Not Assayed

EH = extremely heavy H = heavy M = moderately heavy R = rare NF = None found

Secondary Particulates	#/100 gallon	Comments
Large amorphous debris	R	
Fine amorphous debris	M	
Minerals	R	
Plant pollen	1.2	
Nematodes	0	
Crustaceans	0	
Amoeba	0.5	
Flagellates & ciliates	0.4	
Other: eggs	0.8	
Other: fungal filaments & spores	R	

Comments: Entire floated pellet examined.

Based upon microscopic particulate analysis and the EPA risk factors associated with bio-indicators, there is a low risk of surface contamination. Determination of surface water influence should not be based solely on the results of one or two MPAs. Other pertinent information, such as water quality data and on-site surveys, should be used in conjunction with the MPA results in making this determination.

Reported by: Date: 09/18/98

Lawton Chiles, Governor

Tampa Branch Laboratory
3952 West Dr. Martin Luther King Jr. Boulevard • Tampa, FL 33614-8404
Fax: (813)871-7468 Phone:(813)871-7465 Suncom: 512-6278

James T. Howell, M.D., M.P.H., Secretary

Page two

MPA SOURCE WATER IDENTIFICATION, STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871 Well# 10

Measurements

Meter Reading Final: 61560 Time: 0857 Date: 9-9-98
Well Turbidity Final: 0.20 Time: 0857 Date: 9-9-98
Well Water Temperature Final: — Time: Date:
Well pH Final: Time: Date:
Well Conductivity Final: Time: Date:
Well Chlorine Residual Final: 0.00/0.00 Time: 0857 Date: 9-9-98
Total Chlorine Final: Time: Date:
Meter Reading Start: ~~61560~~ 60800 Time: 1610 Date: 9-8-98
Well Turbidity Start: 0.17 Time: 1605 Date: 9-8-98
Well Water Temperature Start: 26.0°C Time: 1605 Date: 9-8-98
Well pH Start: Time: Date:
Well Conductivity Start: Time: Date:
Well Chlorine Residual Start: 0.00/0.00 Time: 1605 Date: 9-8-98
Total Chlorine Start: 0.00/0.00 Time: Date:
TOTAL WATER VOLUME FILTERED (in gallons): 760

****

Signatures of People Present at Time of Sampling: David Ramos

****

Processing Information:

Total volume filtered: 760 gal
Total filter sediment collected: 200.7 µl
uL sediment/100 gal 26.407
Percoll@/sucrose floatation pellet volume: 14.2 uL
Percoll@/sucrose floatation packed sediment 200 uL
uL floatation pellet volume/100 gallons filtered 1.868 uL

Type of material examined:
___direct examination of unfloated sediment by wet mount or filtered thru MF
_✓_floated (suspended) pellet
___floated packed pellet

Floatation Parameters:
___Percoll@/sucrose gradient
___sucrose gradient
___potassium citrate
___%NSO4

E98- 0818

MPA SOURCE WATER IDENTIFICATION
STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871

community___ non-transient non-community___ non-community___

NAME OF WATER SYSTEM AND ADDRESS: Miami Dade Water + Sewer Dept.
1100 West 2nd Ave. Hialeah, FL. 33010 PHONE (305) 887-2007
SAMPLER NAME AND ADDRESS: David Ramos - 4180 West 10 ct.
Hialeah, FL. 33012 PHONE (305) 829-8611
LAB NAME AND ADDRESS: ~~John E. Preston Water Quality Lab~~ DOH-Tampa Bronc
~~1100 W. 2nd. Ave. Hialeah, FL 33010~~ PHONE ~~(305) 887-2007~~ (813) 871-7465
3952 W. Dr. X Blvd. Mpa, FL 33614
NAME OF ANALYST_____ PROJECT CODE #_____ ACCOUNT#:_____
NAME OF CARRIER AND TRACKING NUMBER: FedEx # 801953974172
DATE SAMPLE RECEIVED BY LABORATORY: 9/10/98, 1040am
NAME OF PERSON RECEIVING SAMPLES INTO THE LABORATORY: Chris Webb
WAS PACKING AND EVIDENCE TAPE INTACT? packed, no evidence tape
TEMPERATURE OF SAMPLES AT RECEIPT: 12°C
DATE AND TIME THE FILTER WAS REMOVED FROM THE HOUSING (IN THE FIELD): 09/09/98 - 0857
DATE AND TIME SAMPLE PROCESSING BEGAN: ~~09/09/98 - 1610~~ 9/10/98, 11°0am

Field information

Water source location: N.W. Wellfield (use latitude and longitude coordinates if available)
Type: well Well ID #: 10
Were wells pumped constantly or cycled on and off on a regular basis for at least two weeks prior to MPA sampling? Yes ✓ No___
Volume of water purged from well prior to sampling_____
Depth of well:_____(ft bls) Depth of casing:_____(ft bls) Screened Interval:_____(ft bls)
Is the well grouted?_____ Grouted Interval:_____(ft bls)
Distance from other wells (within a 1500 foot radius), status of wells (active, inactive), and usage of wells_____
Distance from surface water bodies (indicate whether river, canal, stream, lake, pond, etc.:_____
Distance from any karst features (identify feature e.g. sinkholes):_____
Distance from any pollution sources (indicate types, e.g. septic tanks)_____
Time since last rainfall event, and amount of rainfall in inches (best approximation)_____
09/06/98 - 2.09 inches

****

Attach a detailed sketch of the site. This should include approximate distances to other well(s) and nearby features (i.e. water bodies, sinkholes, pollution sources or other pertinent landmarks) within a 1500 foot radius. Wherever possible provide a statement of the status and usage of any wells within this area. In addition, when available, attach a log of rainfall events and approximate amounts at the well site starting two weeks prior to the site visit.

****

MPA CLASSIFICATION AND QUANTITATION OF PARTICULATES

Sample #: E98-818 Dilution: 1:2 Vol. final pellet (µl): 30

Gallons water examined: 760 Entire floated / unfloated pellet examined: yes / no

Slide #:	1 ☒ MW 9-17-98 100X	2 ☒ MW 9/16/98 400X	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Total count	#/100 gallons	Relative frequency	Risk Factor
Primary Particulates														
Giardia	—	—									—	—	—	—
Coccidia	—	—									—	—	—	—
Diatoms	0	0									0	0	NS	0
Other algae	96	11									107	14.07	R	4
Insect/larvae	0	0									0	0	NS	0
Rotifers	0	0									0	0	NS	0
Plant debris	0	0									0	0	NS	0
other	—	—									—	—	—	—
Secondary particulates														17 = L
Large amorphous debris	R	R									R	R		
Fine amorphous debris	M	M									M	M		
Minerals	R	R									R	R		
Plant pollen	7	2									9	1.18		
Nematodes	0	0									0	0		
Crustacia	0	0									0	0		
Amoeba	4	0									4	0.52		
Ciliate/ Flagellates	3	0									3	0.39		
Other: Eggs	6	0									6	0.78		
Fungal filaments & spores	R	R									R	R		

Laboratory Results
December 1998

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Miami Dade Water and Sewer
Authority Dept.
6800 S.W. 87th Avenue

Miami , FL 33173

Attention: Ray Diaz
Fax: (305) 275-3662

JCH Jim Hein

Report#: 50061
ICR

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory Report #50061

Miami Dade Water and Sewer Authority Dept.
Ray Diaz
6800 S.W. 87th Avenue
Miami , FL 33173

Samples Received
09-dec-1998 16:44:01

NORTHWEST WELL 10 (981209234) Sampled on 12/08/98

Microscopic Particulate Analy.

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
	12/09/98		(ML/EPA)	Amoeba Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Relative Risk Factor, Coccidia	0	RRF	0.0000	1
	12/09/98		(ML/EPA)	Ciliate/Flagellate Quant.	<1	100G	1.0	1
	12/09/98		(SM 9711B)	Coccidia/Crypto(w int struct)	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Crustacea Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Diatoms Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Dipteran Larvae Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Fine Amorphous Debris Quant.	>200	100G	1.0	1
	12/09/98		(ML/EPA)	Fungal Spore Quant.	<1	100G	1.0	1
	12/09/98		(SM 9711B)	Giardia Cysts-Presumptive	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Relative Risk Factor, Giardia	0	RRF	0.0000	1
	12/09/98		(ML/EPA)	Insect Parts and Larvae Quant	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Large Amorphous Debris Quant.	>200	100G	1.0	1
	12/09/98		(ML/EPA)	Minerals Quant.	9	100G	1.0	1
	12/09/98		(ML/EPA)	Miscellaneous Algae Quant.	6	100G	1.0	1
	12/09/98		(ML/EPA)	Mites Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Nematode Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Plant Debris Quant.	28	100G	1.0	1
	12/09/98		(ML/EPA)	Plant Pollen Quant.	1	100G	1.0	1
	12/09/98		(ML/EPA)	Rotifers Quant.	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Other Debris-See Comments	<1	100G	1.0	1
	12/09/98		(ML/EPA)	Diatoms, Rel.Risk Factor	0	RRF	0.0000	1
	12/09/98		(ML/EPA)	Insect Parts/Larv,Rel.Risk F	0	RRF	0.0000	1
	12/09/98		(ML/EPA)	Misc.Algae, Rel.Risk Factor	4	RRF	0.0000	1
	12/09/98		(ML/EPA)	Plant Debris,Rel.Risk Factor	1	RRF	0.0000	1
	12/09/98		(ML/EPA)	Rotifers, Rel.Risk Factor	0	RRF	0.0000	1
	12/09/98		(ML/EPA)	Relative Risk Factor, TOTAL	5	RRF	0.0000	1

MONTGOMERY WATSON LABORATORIES
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555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 566 5227)

Report Comments #50061

(981209234)
@MPA
Sample is at low risk of surface water contamination.

24+24+8 = 56-3 = 53

Montgomery Watson Laboratories

EPA RELATIVE SURFACE WATER RISK FACTORS

Client:	Miami Dade Water and Sewer
Water Source:	NORTHWEST WELL 10
Lab ID#	981209234
Volume Sampled:	790
Filter Setup Date:	12/7/98 ✓
Filter Setup Time:	3:09 PM ✓
Analysis Date:	12/9/98
Analysis Time:	11:00 PM

Weather Conditions:			
At Setup:	☒ Clear	☐ Cloudy	☐ Raining
A Finish:	☒ Clear	☐ Cloudy	☐ Raining
Site Conditions:			
At Setup:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded
A Finish:	☐ Dry	☒ Moderate Standing Water	☐ Area Flooded

Primary Particulates	#/100 Gallon	Relative Frequency**	Relative Risk Factor	Comments
Giardia with internal structures	<1	NS	0	
Coccidia with internal structures	<1	NS	0	
Diatoms	<1	NS	0	
Other Algae	6	R	4	
Insects/larvae	<1	NS	0	
Rotifers	<1	NS	0	
Plant Debris (with chlorophyll)	28	M	1	
		Relative Risk Factor	**5**	** Extremely Heavy, Heavy, Moderate, Rare, Not Significant

Secondary Particulates	#/100 Gallon	Relative Frequency	Relative Risk Factor	Comments
Nematodes	<1	NS	no risk factor	
Crustaceans	<1	NS	no risk factor	
Fungal Spores	<1	NS	no risk factor	
Amoebae	<1	NS	no risk factor	
Flagellates & Ciliates	<1	NS	no risk factor	
Plant Pollen	1	R	no risk factor	
Other: Large Amorphous Debris	>200	EH	no risk factor	
Other: Fine Amorphous Debris	>200	EH	no risk factor	
Other: Minerals Quant.	9	R	no risk factor	
Other: Other Debris	<1	NS	no risk factor	

COMMENTS: Primary surface water indicators observed: **Other Algae Plant Debris (with chlorophyll)**
Based upon microscopic particulate analysis and the proposed EPA risk factors associated with bio-Indicators there is low risk of surface contamination (EPA risk factors <9, low risk)

REFERENCE: Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA), USEPA Manchester Environmental Laboratory, EPA 910/9-92-092, October 1992.

Reviewed by: James C. Hsi **Date: 4/23/99**

FLORIDA DEPARTMENT OF HEALTH

MPA SAMPLE REPORT

Lab Sample # E98-1117 **Utility:** PWS#4130871 Miami Dade Water & Sewer

Date/time Collected 12/07/98 03:09 PM – 12/08/98 07:40 AM **Date/time Processed:** 12/09/98 10:20 AM **By:** Larson

PROCESSING INFORMATION

filter color: gray
color of water around the filter: light tan
Total volume water filtered (gal): 680
Percoll/sucrose flotation pellet volume (µl): NA
Total volume filter sediment (µl): 102
Percoll/sucrose flotation packed sediment (µl): NA
µl sediment/100 gallons sampled: 15.0
µl flotation pellet volume/100 gallons sampled: NA
number of slides examined: 2
material examined: unfloated sediment

Primary Particulates	#/100 gallon	Relative frequency*	Relative Risk Factor	Comments
Giardia	NA			
Coccidia	NA			
Diatoms (with chloroplasts)	0	NS	0	
Other Algae (with chloroplasts)	330	EH	14	euglenoid,clusters, unicells
Insects / Larvae	0	NS	0	
Rotifers	0	NS	0	
Plant Debris	0	NS	0	
		EPA Relative Risk=	14	

*Reference: USEPA Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA): NA = Not Assayed
EH = extremely heavy H = heavy M = moderately heavy R = rare NF = None found

Secondary Particulates	#/100 gallon	Comments
Large amorphous debris	M	
Fine amorphous debris	H	
Minerals	M	
Plant pollen	7.5	
Nematodes	0	
Crustaceans	0	
Amoeba	8.3	
Flagellates & ciliates	2.2	
Other: eggs	6.8	
Other: fungal filaments & spores	R	

Comments:

Based upon microscopic particulate analysis and the EPA risk factors associated with bio-indicators, there is a moderate risk of surface contamination. Determination of surface water influence should not be based solely on the results of one or two MPAs. Other pertinent information, such as water quality data and on-site surveys, should be used in conjunction with the MPA results in making this determination.

Reported by: [signature] Date: 12/14/98

Lawton Chiles, Governor
Tampa Branch Laboratory
3952 West Dr. Martin Luther King Jr. Boulevard • Tampa, FL 33614-8404
Fax: (813)871-7468 Phone:(813)871-7465 Suncom: 512-6278
James T. Hoywll, M.D., M.P.H., Secretary

E98- 1117

MPA SOURCE WATER IDENTIFICATION
STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871

community___ non-transient non-community___ non-community___

NAME OF WATER SYSTEM AND ADDRESS: Miami Dade Water & Sewer Dept. 1100 West 2nd Ave Hialeah, Fl 33010 PHONE(305)887-2007

SAMPLER NAME AND ADDRESS: David Ramos 7435 Bay Hill Drive Miami, Fl 33015 PHONE(305)829-8611

LAB NAME AND ADDRESS: John E. Preston Water Quality Lab 1100 West 2nd Ave. Hialeah, Fl 33010 PHONE(305)887-2007

NAME OF ANALYST_____ PROJECT CODE #_____ ACCOUNT#:_____

NAME OF CARRIER AND TRACKING NUMBER: Fed Ex, #801953974161

DATE SAMPLE RECEIVED BY LABORATORY: 12/9/98, 10:00am

NAME OF PERSON RECEIVING SAMPLES INTO THE LABORATORY: Lee Robson

WAS PACKING AND EVIDENCE TAPE INTACT? Yes

TEMPERATURE OF SAMPLES AT RECEIPT: 12°C

DATE AND TIME THE FILTER WAS REMOVED FROM THE HOUSING (IN THE FIELD): 12/8/98 @ 7:40 am

DATE AND TIME SAMPLE PROCESSING BEGAN: ~~12/7/98 3:00pm~~ 12/9/98, 10:20 am MM

Field information

Water source location: NW Wellfield (use latitude and longitude coordinates if available)

Type: well Well ID #: well # 10

Were wells pumped constantly or cycled on and off on a regular basis for at least two weeks prior to MPA sampling? Yes ✓ No___

Volume of water purged from well prior to sampling_____

Depth of well:_____(ft bls) Depth of casing:_____(ft bls) Screened Interval:_____(ft bls)

Is the well grouted?_____Grouted Interval:_____(ft bls)

Distance from other wells (within a 1500 foot radius), status of wells (active, inactive), and usage of wells_____

Distance from surface water bodies (indicate whether river, canal, stream, lake, pond, etc.:_____

Distance from any karst features (identify feature e.g. sinkholes):_____

Distance from any pollution sources (indicate types, e.g. septic tanks)_____

Time since last rainfall event, and amount of rainfall in inches (best approximation) 12/6/98 0.02 inches

****

Attach a detailed sketch of the site. This should include approximate distances to other well(s) and nearby features (i.e. water bodies, sinkholes, pollution sources or other pertinent landmarks) within a 1500 foot radius. Wherever possible provide a statement of the status and usage of any wells within this area. In addition, when available, attach a log of rainfall events and approximate amounts at the well site starting two weeks prior to the site visit.

****

E98- 1117

Page two

MPA SOURCE WATER IDENTIFICATION, STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871 Well# 10

Measurements

Meter Reading Final:	25860	Time: 7:40 am	Date: 12/8/98
Well Turbidity Final:	0.22	Time: 7:50 am	Date: 12/8/98
Well Water Temperature Final:	—	Time:	Date:
Well pH Final:	—	Time:	Date:
Well Conductivity Final:	—	Time:	Date:
Well Chlorine Residual Final:	0.00/0.00	Time: 9:30 a	Date: 12/8/98
Total Chlorine Final:	0.00/0.00	Time: 9:35 a	Date: 12/8/98
Meter Reading Start:	25180	Time: 3:00 pm	Date: 12/7/98
Well Turbidity Start:	0.28	Time: 7:50 a	Date: 12/8/98
Well Water Temperature Start:	25.0°C	Time: 3:00 pm	Date: 12/7/98
Well pH Start:	—	Time:	Date:
Well Conductivity Start:	—	Time:	Date:
Well Chlorine Residual Start:	0.00/0.00	Time: 9:30 am	Date: 12/8/98
Total Chlorine Start:	0.00/0.00	Time: 9:35 a	Date: 12/8/98

TOTAL WATER VOLUME FILTERED (in gallons): 680

****

Signatures of People Present at Time of Sampling: David Ramos

****

Processing Information:

Total volume filtered: 680 gal
Total filter sediment collected: 102 µl
uL sediment/100 gal 15.0
Percoll@/sucrose floatation pellet volume: na uL
Percoll@/sucrose floatation packed sediment na uL
uL floatation pellet volume/100 gallons filtered na uL

Type of material examined:
✓ direct examination of unfloated sediment by wet mount or filtered thru MF
___ floated (suspended) pellet
___ floated packed pellet

Floatation Parameters:
___ Percoll@/sucrose gradient
___ sucrose gradient
___ potassium citrate
___ %NSO4

MPA CLASSIFICATION AND QUANTITATION OF PARTICULATES

Sample #: E98-1117 Dilution: 1:2 Vol. final pellet (µl): 204

Gallons water examined: 133 Entire floated/ unfloated pellet examined: yes (no)

Slide #:	1 ☒ (dil 1198, 400X)	2 ☒ (MMS 12/2/98 400X)	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Total count	#/100 gallons	Relative frequency	Risk Factor
Primary Particulates														
Giardia	—	—									—	—	—	—
Coccidia	—	—									—	—	—	—
Diatoms	0	0									0	0	NS	0
Other algae *	253	186									439	330.1	EH	14
Insect/larvae	0	0									0	0	NS	0
Rotifers	0	0									0	0	NS	0
Plant debris	0	0									0	0	NS	0
other	—	—									—	—	—	—
Secondary particulates														(14) m
Large amorphous debris	m	M									M	M		
Fine amorphous debris	H	H									H	H		
Minerals	m	M									M	M		
Plant pollen	8	2									10	7.5		
Nematodes	0	0									0	0		
Crustacia	0	0									0	0		
Amoeba	4	7									11	8.3		
Ciliate/ Flagellates	2	1									3	2.2		
Other: Eggs	1	8									9	6.8		
Fungal filaments & spores	R	R									R	R		

* ovalenoids, Clusters, Algae

Laboratory Results
February 1999

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
565 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

Miami Dade Water and Sewer
Authority Dept.
6800 S.W. 87th Avenue

Miami , FL 33173

Attention: ~~Ray Diaz~~ M. Tolly
Fax: (305) ~~275-3668~~ 885-5767

MONTGOMERY WATSON LABS.
SUBMITTED ON
MAR 05 1999

JCH Jim Hain

Report#: 52095
ICR

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc.
565 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 568 LABS (1 800 568 5227)

Laboratory Report #52095

Miami Dade Water and Sewer Authority Dept.
Ray Diaz
6800 S.W. 87th Avenue
Miami , FL 33173

Samples Received
24-Feb-1999 13:48:12

Prepared	Analyzed	QC Batch#	Method	Analyte	Result	Units	MDL	Dilution
N.W. WELL FIELD WELL 10 (9902240141) Sampled on 02/23/99								
				Microscopic Particulate Analy.				
	02/24/99	(ML/EPA	)	Amoeba Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Relative Risk Factor, Coccidia	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Ciliate/Flagellate Quant.	<1	100G	1.0	1
	02/24/99	(SM 9711B	)	Coccidia/Crypto(w int struct)	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Crustacea Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Diatoms Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Dipteran larvae Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Fund Amorphous Debris Quant.	>200	100G	1.0	1
	02/24/99	(ML/EPA	)	Fungal Spore Quant.	<1	100G	1.0	1
	02/24/99	(SM 9711B	)	Giardia Cyst-Presumptive	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Relative Risk Factor, Giardia	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Insect Parts and Larvae Quant	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Large Amorphous Debris Quant.	>200	100G	1.0	1
	02/24/99	(ML/EPA	)	Minerals Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Miscellaneous Algae Quant.	55	100G	1.0	1
	02/24/99	(ML/EPA	)	Mites Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Nematode Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Plant Debris Quant.	4	100G	1.0	1
	02/24/99	(ML/EPA	)	Plant Pollen Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Rotifers Quant.	<1	100G	1.0	1
	02/24/99	(ML/EPA	)	Other Debris-See Comments	n/a	100G	1.0	1
	02/24/99	(ML/EPA	)	Diatoms, Rel.Risk Factor	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Insect Parts/Larv,Rel.Risk F	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Misc.Algae, Rel.Risk Factor	9	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Plant Debris,Rel.Risk Factor	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Rotifers, Rel.Risk Factor	0	RRF	0.0000	1
	02/24/99	(ML/EPA	)	Relative Risk Factor, TOTAL	9	RRF	0.0000	1

MONTGOMERY WATSON LABORATORIES
a Division of Montgomery Watson Americas, Inc
555 East Walnut Street
Pasadena, California 91101
Tel: 626 568 6400 Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Report
Comments
#52095

(9902241014)
GWEA
Sample is at low risk of surface water contamination.

2424-0178-3-41

Montgomery Watson Laboratories

EPA RELATIVE SURFACE WATER RISK FACTORS

Client:	Miami Dade Water and Sewer
Water Source:	NORTHWEST WELL 10
Lab ID#	990224014
Volume Sampled:	850 Gallons
Filter Setup Date:	2/22/99
Filter Setup Time:	5:35 PM
Analysis Date:	2/24/99
Analysis Time:	5:00 PM

Weather Conditions:			
At Setup:	☒ Clear	☐ Cloudy	☐ Raining
A Finish:	☐ Clear	☒ Cloudy	☐ Raining
Site Conditions:			
At Setup:	☒ Dry	☐ Moderate Standing Water	☐ Area Flooded
A Finish:	☒ Dry	☐ Moderate Standing Water	☐ Area Flooded

Primary Particulates	#/100 Gallon	Relative Frequency**	Relative Risk Factor	Comments
Giardia with internal structures	<1	NS	0	
Coccidia with internal structures	<1	NS	0	
Diatoms	<1	NS	0	
Other Algae	55	M	9	
Insects/larvae	<1	NS	0	
Rotifers	<1	NS	0	
Plant Debris (with chlorophyll)	4	R	0	
		Relative Risk Factor	**9**	** Extremely Heavy, Heavy, Moderate, Rare, Not Significant

Secondary Particulates	#/100 Gallon	Relative Frequency	Relative Risk Factor	Comments
Nematodes	<1	NS	no risk factor	
Crustaceans	<1	NS	no risk factor	
Fungal Spores	<1	NS	no risk factor	
Amoebae	<1	NS	no risk factor	
Flagellates & Ciliates	<1	NS	no risk factor	
Plant Pollen	<1	NS	no risk factor	
Other: Large Amorphous Debris	>200	EH	no risk factor	
Other: Fine Amorphous Debris	>200	EH	no risk factor	
Other: Minerals Quant.	<1	NS	no risk factor	
Other: Other Debris	<1	NS	no risk factor	

COMMENTS: Primary surface water indicators observed: **Other Algae Plant Debris (with chlorophyll)**
Based upon microscopic particulate analysis and the proposed EPA risk factors associated with bio-Indicators there is low risk of surface contamination (EPA risk factors <9, low risk)

REFERENCE: Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA), USEPA Manchester Environmental Laboratory, EPA 910/9-92-092, October 1992.

Reviewed by: James C. Hunt **Date: 4/27/99**

FLORIDA DEPARTMENT OF HEALTH

MPA SAMPLE REPORT

Lab Sample # E99-0015 **Utility:** PWS#4130871 Miami Dade Water & Sewer Dept. well #10

Date/time Collected 2/22/99 05:35 PM 2/23/99 07:05 AM **Date/time Processed:** 02/24/99 11:00 AM **By:** Larson/Harrell

PROCESSING INFORMATION

filter color: light gray — color of water around the filter: clear

Total volume water filtered (gal): 820 — Percoll/sucrose flotation pellet volume (µl): 10*

Total volume filter sediment (µl): 90 — Percoll/sucrose flotation packed sediment (µl): 75

µl sediment/100 gallons sampled: 11.0 — µl flotation pellet volume/100 gallons sampled: 1.4

number of slides examined: 1 — material examined: floated (suspended) pellet

Primary Particulates	#/100 gallon	Relative frequency*	Relative Risk Factor*	Comments
Giardia	NA	NA	NA	
Coccidia	NA	NA	NA	
Diatoms (with chloroplasts)	0	NS	0	
Other Algae (with chloroplasts)	874	EH	14	
Insects / Larvae	0	NS	0	
Rotifers	0.1	NS	0	
Plant Debris	0.1	NS	0	
		EPA Relative Risk=	14	

*Reference: USEPA Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA): NA = Not Assayed

EH = extremely heavy H = heavy M = moderately heavy R = rare NF = None found

Secondary Particulates	#/100 gallon	Comments
Large amorphous debris	M	
Fine amorphous debris	EH	
Minerals	H	
Plant pollen	2.5	
Nematodes	0	
Crustaceans	0	
Amoeba	0.3	
Flagellates & ciliates	0	
Other: eggs	2.7	
Other: fungal filaments & spores	R	

Comments: A portion of the filter sediment (80 µl) was floated and this floated pellet was examined to provide the equivalent of 726 gallons of water filtered examined. One slide of the packed pellet from the floatation tube was also examined; it contained 27 algae.

Based upon microscopic particulate analysis and the EPA risk factors associated with bio-indicators, there is a moderate risk of surface contamination. Determination of surface water influence should not be based solely on the results of one or two MPAs. Other pertinent information, such as water quality data and on-site surveys, should be used in conjunction with the MPA results in making this determination.

Reported by: _____ Date: 02/26/99

Jeb Bush
Governor

Tampa Branch Laboratory
3952 West Dr. Martin Luther King Jr. Boulevard • Tampa, FL 33614-8404
Fax: (813)871-7468 Phone:(813)871-7465 Suncom: 512-6278

Robert G. Brooks, M.D.,
Secretary

MPA CLASSIFICATION AND QUANTITATION OF PARTICULATES

Sample #: E99-015 Dilution: 1:2 Vol. final pellet (µl): 20

Gallons water examined: 729 Entire floated / unfloated pellet examined: yes / no

Slide #:	1 ☒	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐	8 ☐	9 ☐	10 ☐	Total count	#/100 gallons	Relative frequency	Risk Factor
Primary Particulates														
Giardia	—										—	—	—	—
Coccidia	—										—	—	—	—
Diatoms	0										0	0	NS	0
Other algae *	6373	(euglenoid, cf. stichococcus, unicellular)									6373	874	EH	14
Insect/larvae	0										0	0	NS	0
Rotifers	1										1	0.1	NS	0
Plant debris	1										1	0.1	NS	0
other	0										0	0	NS	0
Secondary particulates														
Large amorphous debris	M										M	M		
Fine amorphous debris	EH										EH	EH		
Minerals	H										H	H		
Plant pollen	18										18	2.5		
Nematodes	0										0	0		
Crustacia	0										0	0		
Amoeba	2										2	0.3		
Ciliate/ Flagellates	0										0	0		
Other: Eggs	20										20	2.7		
Fungal filaments & spores	R										R	R		

* Animal (examined 8.9% of slide)

MAR-09-1999 13:25 FROM DEP WATER FAC. TALL. TO 61954846042 P.03

MPA SOURCE WATER IDENTIFICATION
STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871

community ✓ non-transient non-community ___ non-community ___

NAME OF WATER SYSTEM AND ADDRESS: Miami Dade Water & Sewer Dept. 1100 West 2nd Ave. Hialeah, FL. 33010 PHONE: (305) 887-2007

SAMPLER NAME AND ADDRESS: JORGE L. RUIZ 18301 NW 82ND CT HIALEAH FL. 33015-2622 PHONE: (305) 828-2255

LAB NAME AND ADDRESS: ~~John E. Preston Water Quality Laboratory~~ DOH Tampa Bran 3152 W. Kennedy Blvd. Tampa, FL 33614 ~~1100 W 2nd Ave. Hialeah, FL 33010~~ PHONE: ~~(305) 887-2007~~ Lab (813) 871-7465

NAME OF ANALYST ___ PROJECT CODE # ___ ACCOUNT#: ___

NAME OF CARRIER AND TRACKING NUMBER: FedEx, #805646569330

DATE SAMPLE RECEIVED BY LABORATORY: 2/24/99

NAME OF PERSON RECEIVING SAMPLES INTO THE LABORATORY: Lea Larson

WAS PACKING AND EVIDENCE TAPE INTACT? yes

TEMPERATURE OF SAMPLES AT RECEIPT: 11°C

DATE AND TIME THE FILTER WAS REMOVED FROM THE HOUSING (IN THE FIELD): 02/23/99 – 7:05 a.m.

DATE AND TIME SAMPLE PROCESSING BEGAN: ~~02/22/99 – 5:25 p.m.~~ 24hr 2/24/99, 11° am

Field information

Water source location: N.W. Wellfield (use latitude and longitude coordinates if available)

Type: well Well ID #: 10

Were wells pumped constantly or cycled on and off on a regular basis for at least two weeks prior to MPA sampling? Yes ✓ No ___

Volume of water purged from well prior to sampling ___

Depth of well: ___ (ft bls) Depth of casing: ___ (ft bls) Screened Interval: ___ (ft bls)

Is the well grouted? ___ Grouted Interval: ___ (ft bls)

Distance from other wells (within a 1500 foot radius), status of wells (active, inactive), and usage of wells ___

Distance from surface water bodies (indicate whether river, canal, stream, lake, pond, etc.: ___

Distance from any karst features (identify feature e.g. sinkholes): ___

Distance from any pollution sources (indicate types, e.g. septic tanks) ___

Time since last rainfall event, and amount of rainfall in inches (best approximation) 02/13/99 – 0.17 inches

****

Attach a detailed sketch of the site. This should include approximate distances to other well(s) and nearby features (i.e. water bodies, sinkholes, pollution sources or other pertinent landmarks) within a 1500 foot radius. Wherever possible provide a statement of the status and usage of any wells within this area. In addition, when available, attach a log of rainfall events and approximate amounts at the well site starting two weeks prior to the site visit.

****

E99- 015

Page two

MPA SOURCE WATER IDENTIFICATION, STATE OF FLORIDA SAMPLE ID SHEET

PWS ID# 4130871 Well# 10

Measurements

Meter Reading Final: 27090 Time: 7:05 Date: 2/23/99
Well Turbidity Final: 0.41 NTU Time: 7:10 Date: 2/23/99
Well Water Temperature Final: 21.9 Time: 7:10 Date: 2/23/99
Well pH Final: 7.30 Time: Date:
Well Conductivity Final: Time: Date:
Well Chlorine Residual Final: 0.00 Time: 7:10 Date: 2/23/99
Total Chlorine Final: 0.00 Time: 7:10 Date: 2/23/99
Meter Reading Start: 26270 Time: 5:35 Date: 2/22/99
Well Turbidity Start: 0.30 NTU Time: 5:30 Date: 2/22/99
Well Water Temperature Start: 21.9 Time: 5:30 Date: 2/22/99
Well pH Start: 7.29 Time: Date:
Well Conductivity Start: Time: Date:
Well Chlorine Residual Start: 0.00 Time: 5:30 Date: 2/22/99
Total Chlorine Start: 0.00 Time: 5:30 Date: 2/22/99
TOTAL WATER VOLUME FILTERED (in gallons): 820

****

Signatures of People Present at Time of Sampling: Jorge E. Ruiz

****

Processing Information:

Total volume filtered: 820 gal.
Total filter sediment collected: 90 uL
uL sediment/100 gal 11.0
Percoll@/sucrose floatation pellet volume: 10* uL *729 gal. floated
Percoll@/sucrose floatation packed sediment 75 uL
uL floatation pellet volume/100 gallons filtered 1.4 uL

Type of material examined:
___ direct examination of unfloated sediment by wet mount or filtered thru MF
_X_ floated (suspended) pellet
___ floated packed pellet

Floatation Parameters:
_X_ Percoll@/sucrose gradient
___ sucrose gradient
___ potassium citrate
___ %NSO4