DOWN
Construction Report
St. Sebastian River Buffer Preserve
Well No. BR-1559
Brevard County
Florida

SJRWMD PROGRAM NO. 31-58200

Division of Ground Water Programs
Department of Resource Management
St. Johns River Water Management District
Palatka, Florida
November 5, 1996

TABLE OF CONTENTS

APPENDICES

Appendix

A. Scope of Work
B. Lithologic Data
C. Completion Reports

FIGURES

TABLES

I INTRODUCTION{tc "I INTRODUCTION" \f C \l 1}

A. Purpose{tc "A. Purpose" \f C \l 2}

The primary objective of the District Observation Well Network (DOWN) Construction program is the safe installation of monitoring wells that meet or exceed design criteria. A conscientious effort shall be made to document all methods, materials and equipment used; and all data shall be collected and recorded in accordance with accepted Quality Assurance and Quality Control (QA/QC) protocols.

B. Scope of Work{tc "B. Scope of Work" \f C \l 2}

The work was requested by the SJRWMD Division of Land Management. The objectives (Appendix A) included the construction of one six inch diameter Floridan Aquifer supply well to be used for livestock and fire protection.

C. Site Location/Site Description{tc "C. Site Location/Site Description" \f C \l 2}

The site (Figure 1) is located east of Interstate 95 at the St. Sebastian River Buffer Preserve in Brevard County, Florida.

The supply well (BR-1559) is in a grass field with scattered palmetto patches and pine trees approximately 500 feet (ft.) east of a horse coral. The site is approximately 34 ft. above mean sea level (msl).

D. Field Services{tc "D. Field Services" \f C \l 2}

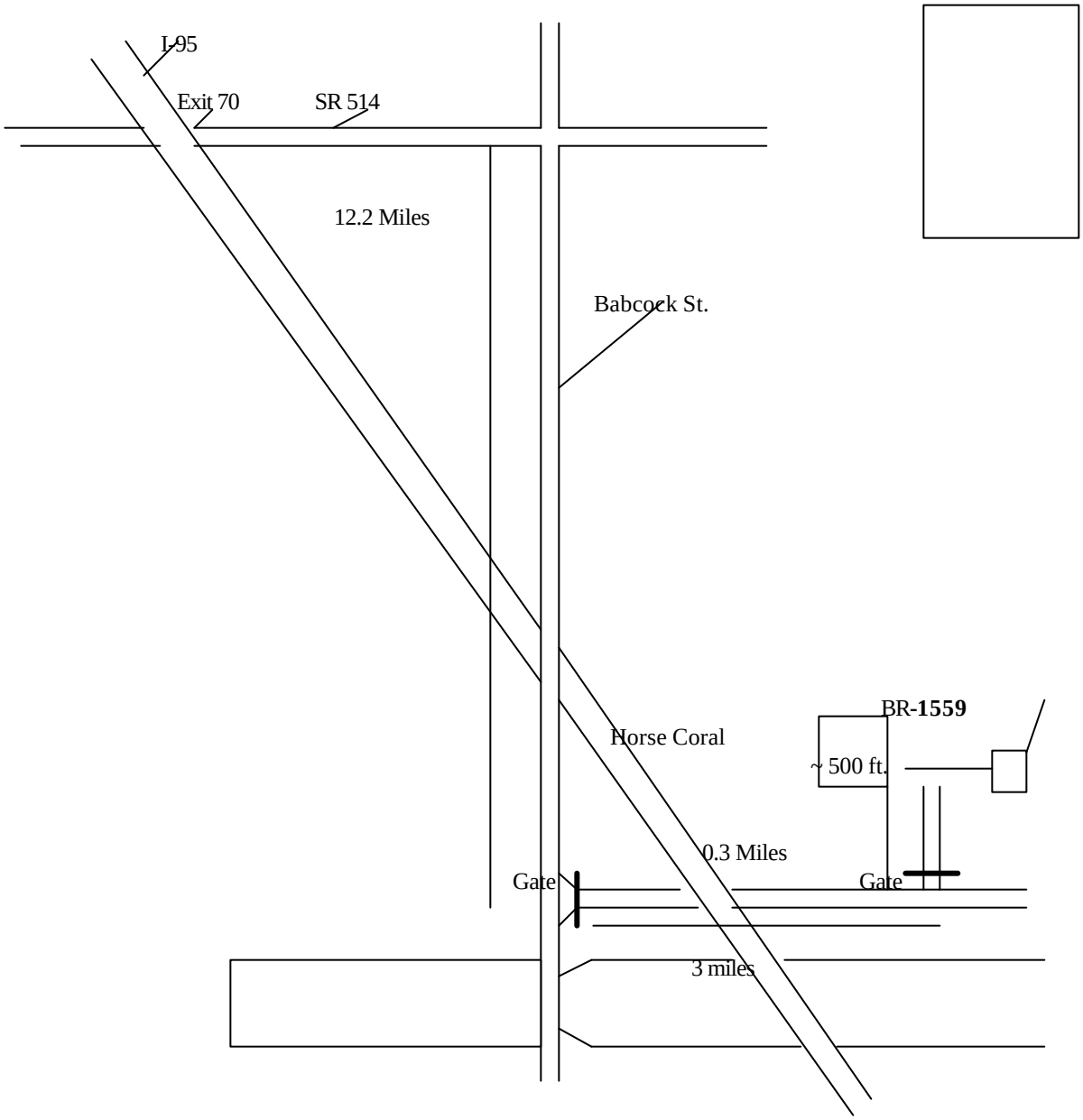
CenTech Utility Corporation of Tampa, Florida was the contractor. Field services in support of well construction were provided by St. Johns River Water Management District personnel as listed below:

Work Request: Jennifer McMurtray
Senior Hydrologist: Nolan Col
Field Support/Coordination: Mark Ward
Field Hydrologist and Report Preparation: Robert Brooks

II GEOLOGY{tc "II GEOLOGY" \f C \l 1}

A. General{tc "A. General" \f C \l 2}

Brevard county is a coastal county in the central portion of the Florida peninsula. The topography in the county is a result of marine deposition and sea level fluctuations. The site statigraphy (*Brown, Kenner, Crooks and Foster, Water Resources of Brevard County, Florida, F. G. S., Report of Investigation No. 28, 1962, p.15*) consists of Eocene age carbonates overlain by Miocene and Plio-Pleistocene to Recent unconsolidated sediments. The Upper Eocene carbonates consist of limestone



Project:	St. Sebastian River Buffer Preserve Brevard County	**SJRWMD**
Project No:	31-58200	
Well Completion:	October 20, 1995	**Figure 1. Site Map**
	Not To Scale	

and dolomite units (the Avon Park Formation and the overlying Ocala Group). Miocene age sediments (Hawthorn Group) which overlie the Ocala Group consist of interbedded clays, silts, carbonates, and phosphatic material. Pliocene sediments consist of sandy shell marl, green clay, sand, and silty shell. Pleistocene to Recent sediments consist of sand, silt coquina and shell.

B. Site Stratigraphy{tc "**B. Site Stratigraphy**" \f C \l 2}

The lithology encountered during drilling consisted of Recent to Eocene age sediments. The sediments consisted of sands, shells, cemented sand and shell and minor clay from land surface to 125 ft. below land surface (bls), green clay and dolomite from 125 ft. bls to 337 ft. bls and fossiliferous limestone from 337 ft. bls to 410 ft. bls. Lithologic samples were collected every five ft. in unconsolidated sediments and every ten ft. in consolidated sediments. Field descriptions of lithologic samples are included in Appendix A.

C. Ground Water Levels{tc "**C. Ground Water Level**" \f C \l 2}

On site, the Floridan Aquifer is under artesian conditions (Table 1); ground water levels were not measured during drilling. The artesian flow from the supply well was measured at approximately 200 gallons per minute at four ft. above the land surface after drilling was completed to 410 ft. bls.

D. Drilling Data{tc "**D. Drilling Data**" \f C \l 2}

The drilling time was recorded once reverse air drilling started in the consolidated rock. Total drilling time for 71 ft. with a six inch diameter bit was 140 minutes; an average of two minutes per ft. (Table 1).

Table 1. Ground Water Levels and Drilling Data

Water Levels			Borehole Data		Drilling Time Data			
Date/Time (yy:mm:dd/hh:mm)	Casing (ft., bls)	Rod (ft., bls)	Total Depth (ft., bls)	Open Hole (ft.)	Bit Size (in)	From (ft., bls)	To (ft., bls)	Time (min)
961007/1005	flowing	flowing	350	11	6	339	350	10
961007/1145	flowing	flowing	370	31	6	350	370	65
961007/1215	flowing	flowing	380	41	6	370	380	10
961007/1240	flowing	flowing	390	51	6	380	390	15
961007/1405	* flowing	flowing	410	71	6	390	410	40

Comments: 6 inch dia. well casing set at 339 ft. bls ,* Discharge Rate = 200 GPM at + 4.5 ft. above land surface.

E. Ground Water Quality{tc "E. Ground Water Quality" \f C \l 2}

1. Field Analysis{tc "1. Field Analysis" \f C \l 3}

Ground water quality field analysis was performed during reverse air drilling of supply well BR-1559. The parameters measured were temperature, chlorides and conductivity (Table 2 and Figure 2). The ground water temperature was 25 degrees Celsius from 340 ft. bls to 370 ft. bls and 25.5 degrees Celsius from 380 ft. bls to 410 ft. bls. Chlorides and conductivity increased gradually from 300 mg/l and 1,483 us/cm at 340 ft. bls to 390 mg/l and 1,784 us/cm at 410 ft. bls. Chlorides and conductivity were analyzed with a HACH Titration Kit using the mercuric nitrate method. Temperature and conductivity were measured with a YSI Model 33 conductivity meter.

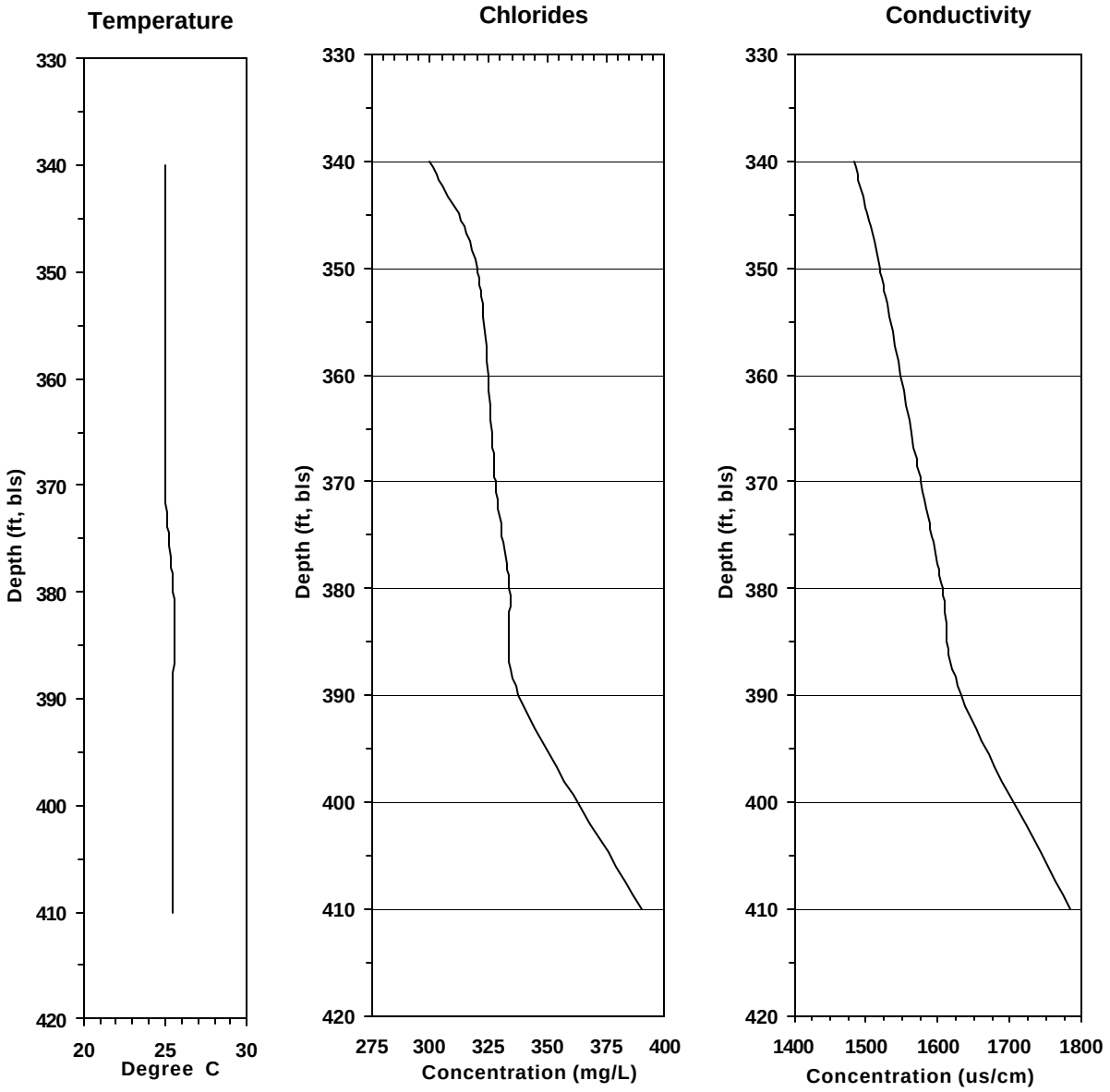
Table 2. Ground Water Quality Data

Date/Time (yy:mm:dd/hh:mm)	Sample Depth (ft., bls)	Open Hole (ft.)	Temp (Deg C)	Chlorides (mg/L)	Conductivity (us/cm)
961007/0740	340	1	25	300	1,483
961007/0740	350	11	25	320	1,519
961007/0740	370	31	25	328	1,576
961007/0740	380	41	25.5	334	1,606
961007/0740	390	51	25.5	338	1,632
961007/0740	410	71	25.5	390	1,784

yy:mm:dd/hh:mm = year:month:date/hour:minute
Deg C = Degree Celsius
mg/L = Milligrams/Liter
us/cm = MicroSiemens/Centimeter

2. Laboratory Analysis{tc "2. Laboratory Analysis" \f C \l 3}

Water quality samples were collected from supply well BR-1559 after drilling operations were complete. Ground water samples were collected for laboratory analysis at a depth of 410 ft. bls. The samples will be analyzed for alkalinity, chlorides, fluoride, sulfate, silica, total dissolved solids, barium calcium, magnesium, sodium, potassium, iron and strontium. Laboratory analytical results of ground water samples are not included in this report.



Project:	St. Sebastian River Buffer Preserve Brevard County
Project No:	31-58200

SJRWMD

Figure 2.

Monitor Well BR-1559 Ground Water Quality vs Depth

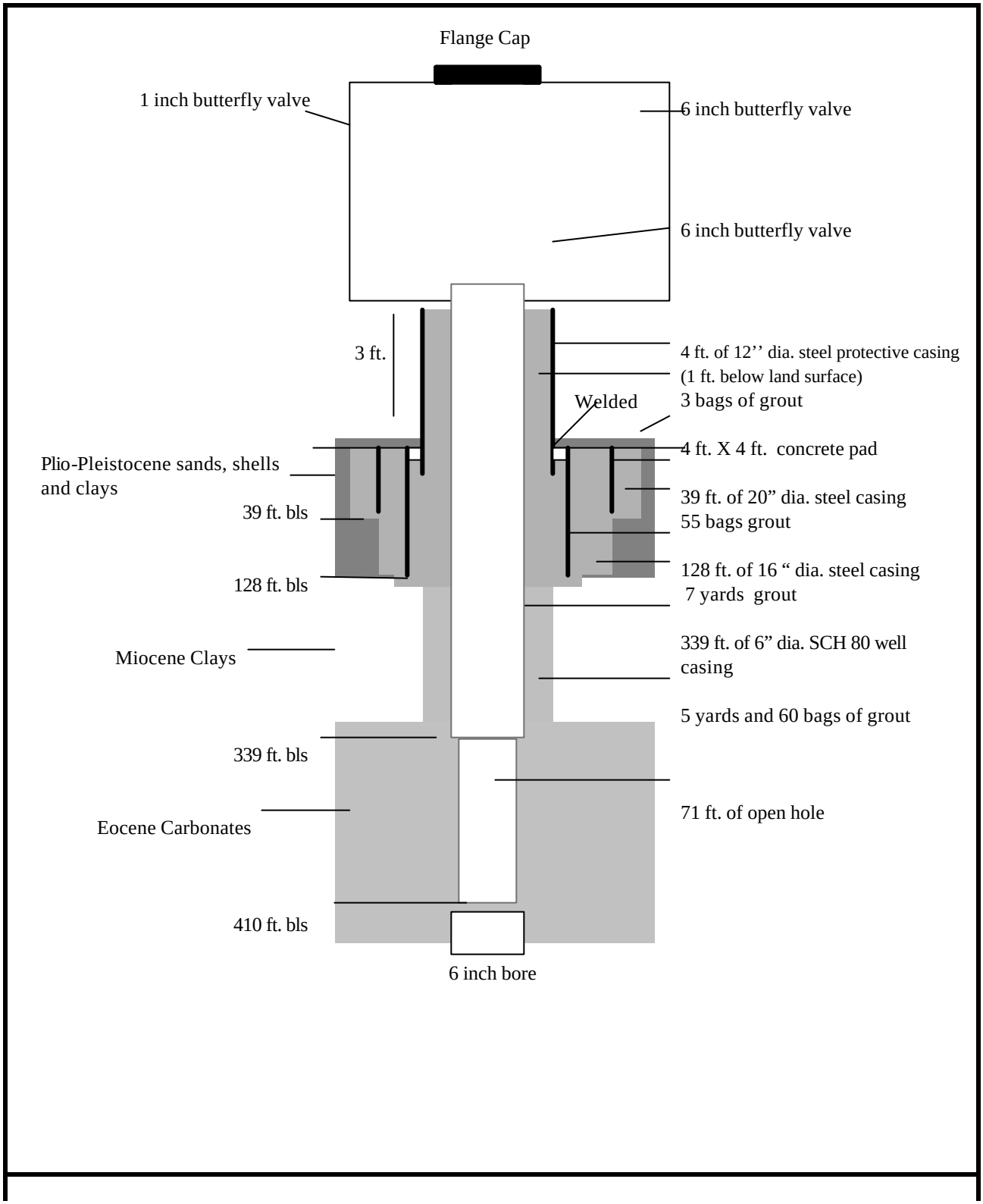
III Supply Well Construction{tc "III Supply Well Construction" \f C \l 1}

Construction on supply well BR-1559 was started on September 9, 1996 and completed on October 10, 1996. To determine surface casing requirements a test hole was drilled to 150 ft. bls using the mud rotary method and a 6 inch (in.) diameter (dia.) drill bit. The test hole was then enlarge with a 22 in. dia. bit to 39 ft. bls and 39 ft. of 20 in. dia. steel casing was placed in the borehole and pressure grouted in place with 55 bags of Type I Portland Cement (grout) on 9/13/96 (Table 3). Drilling continued on 9/16/96 and the borehole was advanced with a 19 in. dia. bit to 155 ft. bls in order to set 150 ft. of 16 in. dia. steel casing. The casing kept hanging up inside the borehole and would not go past eighty ft. The 16 in. dia. casing was then removed and the entire length of the borehole was reamed with the 19 in. bit. A second attempt to set the casing at 150 ft. bls failed at 125 ft. bls. The borehole was then reamed again and a third attempt of setting the casing was made. On 9/19/96 the 16 in. dia. casing was placed in the borehole to a depth of 128 ft. Apparently the green clay encountered at 125 ft. was swelling and prevented further advancement of the casing. The casing was then pressure grouted in place with 7 yards of grout. The borehole was then advanced to 339 ft. (top of Floridan Aquifer) and a six in. dia. schedule 80 PVC well casing with five centralizers placed every 60 ft. was placed to a depth of 339 ft. and tremie grouted to one ft. bls with 21 bags grout (9/27/96), 5 yards grout (9/30/96), and 39 bags grout (10/1/96). On 10/7/96 reverse air drilling began at 340 ft. bls with a six in. dia. bit. The well started flowing at 340 ft. bls and a rubber plug was placed around the drill pipe and placed inside the top of the six in. casing to restrict the flow and prevent the site from flooding. Drilling stopped at 410 ft. bls and the well was developed for one hour. The well was completed on 10/10/96 with a four ft. by four ft. concrete pad and a well head consisting of a four ft. section of 12 in. dia. steel protective casing with the bottom (1) foot welded to the 16 in. dia. casing and grouted in place. Two six in. dia. butterfly valves, a one in. dia. butterfly valve and a flange cap complete the well head (Figure 3).

Table 3. Grout Data

DATE	TAG DEPTH (FT.)	ANNULUS/ BORE	VOLUME (YARDS/BAGS)	GROUT/ MATERIAL	COMMENTS
9/13/96	39	22” A	55 bags	grout	39 ft. of 20” dia. steel casing pressure grouted
9/16/96	4.5	22” A	NA	NA	Tag grout in the annulus of the 20” steel casing
9/16/96	155*	19” A	7 yards	grout	128 ft. of 16” dia. steel casing pressure grouted
9/20/96	5	19” A	NA	NA	Tag grout in the annulus of the 16” steel casing
9/27/96	342	13” A	21 bags	grout	Tremie grout 339 ft. of 6” dia. SCH 80 PVC well casing
9/30/96	300	13” A	5 yards	grout	Tremie grout well casing
10/01/96	60	13’’ A	39 bags	grout	Tremie grout well casing
10/02/96	1	13’’ A	NA	NA	Well casing grouted to one foot bls
10/10/96	1	12’’ A	3 bags	grout	4 ft. of 12 inch dia. steel casing grouted from one ft. bls to surface and 6 inch dia casing grouted from one ft. bls to + 3 ft. above land surface.

* The bore was drilled to 155 ft. bls and 128 ft. of 20 in. steel casing was pressure grouted inside the bore. When drilling out after pressure grouting very little grout was encountered below the bottom of the casing.


Flange Cap
1 inch butterfly valve
6 inch butterfly valve
6 inch butterfly valve
3 ft.
4 ft. of 12'' dia. steel protective casing
(1 ft. below land surface)
Welded
3 bags of grout
4 ft. X 4 ft. concrete pad
Plio-Pleistocene sands, shells and clays
39 ft. bls
39 ft. of 20" dia. steel casing
55 bags grout
128 ft. bls
128 ft. of 16 " dia. steel casing
7 yards grout
Miocene Clays
339 ft. of 6" dia. SCH 80 well casing
5 yards and 60 bags of grout
339 ft. bls
71 ft. of open hole
Eocene Carbonates
410 ft. bls
6 inch bore

Project:	St. Sebastian River Buffer Preserve Brevard County	**SJRWMD**
Project No:	31-58200	**Figure 3.**
Well Completed:	10/10/96	**Supply Well BR-1559**
	Not To Scale	

APPENDIX A

PROJECT MANAGERS SCOPE OF WORK

APPENDIX B
Lithologic

WELL NUMBER: BR-1559
TOTAL DEPTH: 410 ft. bls
SAMPLES COLLECTED: 0-410 ft. bls
COMPLETION DATE: 10/10/96
OWNER/DRILLER: SJRWMD/CenTech

COUNTY: Brevard
Lat: 27^0 50' 03"
Long: 80^0 33' 02"
ELEVATION: ~34' MSL

Samples Worked in Field By: Robert Brooks

Depth (ft.)	Lithologic Description
0	Sand, fine, gray
0-5	Sand, fine to medium, dark gray
5-10	Sandy clay and shell gray
10-15	Shells
15-20	Shell and sand, organic, fine, dark gray
20-25	Shells
25-30	Shell and sand, cemented to partially cemented, gray
30-35	Same as above (SAA)
35-40	SAA
45-70	Shells
70-75	SAA
75-95	Shells and minor sand, fine, gray
95-100	Shells and sand, silty to fine, gray
100-125	Shell and sand, partially cemented to cemented, minor clay, gray
125-215	Clay, green
215-220	Dolomite, phosphate inclusions, olive green
220-337	Clay, green
337-410	Limestone, wackestone, abundant *Lepidocyclina* and minor echinoids, creme

APPENDIX C
Completion Report